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# **Application of methods for handling unmeasured confounding in pharmacoepidemiological studies**

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**Thesis submitted in accordance with the requirements for the degree of Doctor of  
Philosophy of the University of London**

**2023**

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Scholarship funded by GSK

## **DECLARATION**

I, Jeremy Brown, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

## **ABSTRACT**

Non-interventional studies can provide meaningful insights on important questions of drug safety and effectiveness. However, these studies can be vulnerable to residual biases, which threaten the validity of results.

In this thesis I outline and apply methods to reduce, diagnose, and quantify bias due to unmeasured confounding in non-interventional studies. I apply these methods to two drug safety areas where unmeasured confounding may have affected published findings:

- (1) the association between proton pump inhibitor prescribing and mortality
- (2) the associations of fluoroquinolone prescribing with incidence of uveitis, retinal detachment, aortic aneurysm or aortic dissection hospitalisation, and peripheral neuropathy

The methods applied include active comparators and self-controlled designs to reduce confounding; secondary comparator groups, negative control outcomes, and the high-dimensional propensity score to diagnose residual confounding; and quantitative bias analysis to quantify the potential effect of unmeasured confounders.

In a cohort study I find evidence of an association between proton pump inhibitor prescribing and increased all-cause and cause-specific mortality. However, the findings of methods to diagnose and quantify residual confounding, including the high-dimensional propensity score and secondary comparator groups, bring into question the causality of the association.

I do not find strong evidence for an association between fluoroquinolone prescribing and aortic aneurysm or dissection, uveitis, or retinal detachment in cohort or self-controlled studies with active comparators. I do find some evidence for an association between fluoroquinolone prescribing and peripheral neuropathy. However, the association is small and could possibly be explained by residual confounding as highlighted by quantitative bias analysis.

In conclusion, while unmeasured confounding can threaten the validity of pharmacoepidemiological studies, there are valuable approaches available to reduce, diagnose, and quantify this bias. In this thesis these approaches have been outlined and employed in order to demonstrate their value, and to provide more robust insight on two important drug safety topics.

## **FOREWARD**

In this thesis I outline and apply methods to reduce, diagnose, and quantify bias due to unmeasured confounding to two drug safety areas where unmeasured confounding may have affected published findings: 1) associations between proton pump inhibitor prescribing and mortality, 2) associations of fluoroquinolone prescribing with incidence of uveitis, retinal detachment, aortic aneurysm or aortic dissection hospitalisation, and peripheral neuropathy.

The structure of the thesis is as follows. First, I provide background on confounding and unmeasured confounding, methods to quantify bias due to unmeasured confounding, and on the two drug safety topics studied.

Given the breadth of the literature on fluoroquinolone safety I then appraise in detail, in a literature review, previous publications on associations between fluoroquinolones and the studied outcomes.

I describe, in a data and methods section, the data sources I used to conduct non-interventional studies. In this section, I also introduce the non-interventional studies I conducted and detail the methods I applied to reduce, diagnose, and quantify bias due to unmeasured confounding in these studies.

In detail, in a research paper, I review the potential utility and limitations of a specific approach, quantitative bias analysis, that can be used to quantify potential residual bias due to unmeasured confounding.

In a series of research papers, I report the results of the non-interventional studies I conducted. First, I report the results of a cohort study I conducted to estimate the association between proton pump inhibitor prescribing and mortality. I then report the results of a series of studies I conducted estimating associations between fluoroquinolone prescribing and uveitis, retinal detachment, hospitalisation with aortic aneurysm or aortic dissection, and peripheral neuropathy.

Finally, I summarise the findings of the non-interventional studies, highlighting how methods to reduce, diagnose and quantify unmeasured confounding provided additional insight. I conclude with discussion of the implications of findings and areas for future research.



## **ACKNOWLEDGEMENTS**

There are many to whom I owe a debt of gratitude for their help to complete this thesis.

I owe many thanks to my primary supervisor, Ian Douglas, for his encouragement, expertise, and wisdom.

My sincere thanks to my second supervisor, Kevin Wing, for his support, expertise, and knowledge.

I owe much gratitude to my third supervisor, Nicholas Galwey, for his keen insights, wisdom, and sharp editorial eye.

Many thanks to Kate Mansfield and Clemence Leyrat for providing sage input as part of my advisory panel.

I am grateful to GSK plc. for providing the funding for this PhD. One highlight of the PhD has been rewarding collaboration and insightful interactions with talented individuals working at GSK, especially Nicholas Galwey, Jake Hunnicutt and Marianne Cunnington.

To my friends my thanks for providing necessary distractions from the PhD. I owe thanks to my fellow research degree students and my colleagues at the London School of Hygiene and Tropical Medicine who made the PhD a much more enjoyable experience.

Thanks to my parents, Anne and Phil, and sister, Emmeline, who supported me throughout the PhD and especially during the home stretch.

## **FUNDING**

This research degree was supported by a PhD studentship funded by GSK.

## **ABBREVIATIONS**

|          |   |
|----------|---|
| AA/AD    | Aortic Aneurysm/Aortic Dissection               |
| ASD      | Absolute Standardised Difference                |
| ATT      | Average Effect of Treatment Amongst the Treated |
| BHF      | British Heart Foundation                        |
| BMI      | Body Mass Index                                 |
| BNF      | British National Formulary                      |
| CCAIE    | Commercial Claims and Encounters                |
| CI       | Confidence Interval                             |
| CKD      | Chronic Kidney Disease                          |
| COPD     | Chronic Obstructive Pulmonary Disease           |
| COVID-19 | Coronavirus Disease 2019                        |
| CNS      | Central Nervous System                          |
| CPRD     | Clinical Practice Research Datalink             |
| CTC      | Case-Time-Control Study                         |
| DNA      | Deoxyribonucleic Acid                           |
| EMBASE   | Excerpta Medica Database                        |
| EHR      | Electronic Health Records                       |
| EMA      | European Medicines Agency                       |
| EMR      | Electronic Medical Record                       |
| FDA      | United States Food and Drug Administration      |
| FDAERS   | FDA Adverse Event Reporting System              |
| FQ       | Fluoroquinolone                                 |
| GI       | Gastrointestinal                                |
| GORD     | Gastroesophageal Reflux Disease                 |

|           |  |
|-----------|--|
| GP        | General Practitioner   |
| H2RA      | H2 Receptor Antagonist   |
| hd-PS     | High-Dimensional Propensity Score                                    |
| HES APC   | Hospital Episode Statistics Admitted Patient Care                    |
| HIV       | Human Immunodeficiency Virus   |
| HLA B27   | Human Leukocyte Antigen B27  |
| HR        | Hazard Ratio   |
| HSV       | Herpes Simplex Virus   |
| ICD       | International Classification of Diseases and Related Health Problems |
| IMD       | Index of Multiple Deprivation  |
| IPTQ      | Inverse Probability of Treatment Weighting                           |
| IQR       | Interquartile Range  |
| ISAC      | Independent Scientific Advisory Committee for MHRA Database Research |
| JAMA      | Journal of the American Medical Association                          |
| LABA-LAMA | Long-Acting $\beta$ Agonist plus Long-Acting Muscarinic Antagonist   |
| LSHTM     | London School of Hygiene and Tropical Medicine                       |
| MEDLINE   | Medical Literature Analysis and Retrieval System Online              |
| MHRA      | Medicines and Healthcare Products Regulatory Authority               |
| MRC       | Medical Research Council   |
| NHS       | National Health Service  |
| NIHR      | National Institute for Health and Care Research                      |
| NPV       | Negative Predictive Value  |
| NSAID     | Non-Steroidal Anti-Inflammatory Drug                                 |
| ONS       | Office for National Statistics                                       |
| OR        | Odds Ratio   |

|        |  |
|--------|--|
| OTC    | Over the Counter                       |
| PPI    | Proton Pump Inhibitor                  |
| PPV    | Positive Predictive Value              |
| PS     | Propensity Score                       |
| PY     | Person-Years                           |
| RCT    | Randomised Controlled Trial            |
| RD     | Risk Difference                        |
| RR     | Risk Ratio/Rate Ratio                  |
| SCCS   | Self-Controlled Case Series            |
| SUTVA  | Stable Unit Treatment Value Assumption |
| THIN   | The Health Improvement Network         |
| QBA    | Quantitative Bias Analysis             |
| UK     | United Kingdom                         |
| US/USA | United States of America               |
| UTI    | Urinary Tract Infection                |
| WHO    | World Health Organisation              |

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# CHAPTER 1. BACKGROUND

## Overview

In this chapter I provide background information on unmeasured confounding, quantitative bias analysis, and on the two drug safety topics studied: the association between proton pump inhibitor prescribing (PPIs) and all-cause mortality, and the associations between fluoroquinolone prescribing and incidence of uveitis, retinal detachment, peripheral neuropathy, and hospitalisation with aortic aneurysm or dissection (AA/AD).

Initially, I provide an overview of confounding, unmeasured confounding, and frameworks for causal inference. I then review quantitative bias analysis, a group of methods for quantifying potential bias in study results due to unmeasured confounders.

The focus of my thesis is the application of methods for handling unmeasured confounding to two drug safety issues. I introduce these two drug safety areas briefly in this chapter, before a more in-depth literature review in the next chapter focusing on the primary applied focus of this thesis, namely associations between fluoroquinolone prescribing and the studied outcomes.

To conclude the chapter, I outline the overall aims, rationale, and objectives of this PhD project.

## **1.1 Confounding and unmeasured confounding**

### **1.1.1 Definition of confounding and unmeasured confounding**

Epidemiology is principally concerned with the study of health in populations.<sup>1</sup> The aims of an epidemiological study may be descriptive, etiological or predictive. That is, we may wish to describe health and disease in a population, understand the cause-effect relationship between exposures and health states, or to predict health states given individual or group characteristics.

To understand the cause-effect relationship between exposures and health states we typically estimate associations between the exposure and the health state (i.e., the outcome) in a sample from a population, using statistical methods. However, observed associations may not necessarily be causal. Associations can arise wholly or partly due to a common cause of both exposure and outcome. When associations are biased away from the causal effect due to such a common cause, we say there is confounding, and we call the variables responsible for this bias confounders.

As an example of confounding, consider the causal question of whether coffee consumption increases or decreases the risk of death. A number of non-interventional studies have been conducted to investigate this and have found an inverse association, with greater coffee consumption associated with reduced mortality.<sup>2,3</sup> However, while an inverse association has been consistently observed, it is not clear to what extent this association is causal. The observed association may be partly or wholly due to confounding by lifestyle or socioeconomic factors associated with coffee consumption. For instance, suboptimal diet has been found to be negatively associated with coffee consumption in the United States (US) and is also a risk factor for increased mortality.<sup>4,5</sup>

In pharmacoepidemiology, in order to understand drug safety or effectiveness, we often compare users of one drug to non-users, or, in the active comparator design, to users of another drug. However, a user of a drug will have been prescribed the drug for a particular indication. Their health status is therefore likely to differ from that of non-users or from users of alternative medications, leading to confounding by indication.<sup>6,7</sup>

In randomised controlled trials confounding can be avoided by means of randomisation, whereas in non-interventional studies we must typically rely on study design or statistical methods. When confounding is measured it can be controlled in epidemiological studies

through methods such as restriction, stratification, matching, regression adjustment, propensity score weighting, and G-computation.<sup>8</sup>

However, in some studies not all potential confounders can be measured or controlled. In studies conducted using routinely collected healthcare data, such as electronic health records or insurance claims data, the investigator is typically limited to variables previously recorded for clinical or administrative purposes.<sup>9</sup> Therefore, there may be potential confounders that have not been measured. Even confounders that have been recorded may be mismeasured, which can lead to bias.<sup>10</sup>

In prospective studies the investigator can specify the variables to be collected. However, even in this situation it may not be practically feasible to collect information on some potential confounders, for example due to cost.

Both in studies conducted with prospectively collected data and with historical data, there is a possibility that the study investigator did not consider a measured confounder for inclusion. This is particularly likely for a research topic in which there has been limited prior research. Finally, even if confounders are measured and included they may be inadequately handled in analysis (e.g. by categorisation of a continuous variable), leading to residual confounding in effect estimates.<sup>11</sup>

### **1.1.2 Early frameworks for causal inference**

Causal inference is the name given to the process of inferring causal effects from data. An early attempt at defining a framework for identifying causal effects was made by Bradford Hill in 1965. Hill laid out a set of considerations for assessing causality: strength of association, consistency, specificity, temporality, biologic gradient, experimental evidence, and analogy.<sup>12</sup> While all these considerations are useful, only temporality (i.e. cause precedes effect) is a requisite condition for causal effect.<sup>1</sup> Furthermore, the utility of many of these considerations as a guide to assessing causation is questionable.<sup>13</sup> For example, an association may be strong due to strong confounding rather than due to a causal effect.

### **1.1.3 Potential outcomes**

A framework for causal inference that has seen enduring popularity is the potential outcomes framework.<sup>14</sup> The potential outcome framework initially arose with respect to randomised experiments in work by Neyman and Fisher in the 1920s, but was only formally generalised to non-interventional studies in the 1970s by Rubin.<sup>15-18</sup>

When comparing a treatment of interest to a comparator we would ideally like to observe the outcome if individuals had received treatment of interest compared to if the same patients had received the comparator. However, for any individual we only observe one outcome, the outcome observed under the assigned treatment: the other outcome for any individual is counterfactual. There are two potential outcomes here, but only one outcome is observed, which is known as the fundamental problem of causal inference.<sup>8, 15</sup>

Unfortunately, we cannot estimate individual causal effects such as the difference in outcome if the same patient had received treatment relative to comparator.<sup>8</sup> However, in some circumstances we can estimate average causal effects, representing the difference between the average potential outcomes of a group of individuals if the group had been assigned treatment relative to if the group had been assigned the comparator.

In randomised trials, the average observed effect and the average causal effect will be the same, as randomisation ensures that the potential outcomes are independent of treatment assignment.<sup>15</sup> Either group could have its treatment assignment exchanged, and the average outcome occurrence (i.e. potential outcomes) in treated and comparator groups would be the same. In this situation there will be exchangeability between the treatment and comparator group, and we can estimate the causal effect using the observed data.

In non-interventional studies, the treatment and comparator groups may differ considerably at baseline, and as a result the potential outcomes are not typically independent of assigned treatment.<sup>8</sup> However, it may be that the potential outcomes are independent of assigned treatment conditional on a set of measured confounders  $X$ . If we have this conditional exchangeability assumption (i.e. no unmeasured confounders) then we can estimate the causal effect by adjusting for these measured confounders.<sup>19</sup>

Other assumptions in addition to exchangeability that are typically required for the estimation of the average causal effect in the potential outcomes framework are<sup>15</sup>:

- consistency and no interference, collectively referred to as the stable unit treatment value assumption (SUTVA)
- positivity

Consistency requires that the observed outcome is the same as the outcome that would have been realised had the exposure been set at its observed value by means of an intervention.<sup>8, 20</sup> This assumption may not be met if the intervention is not well-defined. For example, if we

are studying the effect of obesity on cardiovascular disease it is unclear what it would mean to ‘set’ obesity to a particular level – do we mean that we change obesity through diet, through exercise, or through a specified combination of both? It is likely that different ways of intervening on obesity would lead to different outcomes.<sup>21, 22</sup>

The no-interference assumption requires that the potential outcomes for an individual are not affected by the treatment assigned to other individuals.<sup>8</sup> A clear example where this assumption is not met is in vaccination programs, because the infection risk for an individual is impacted by the vaccination of other individuals through herd immunity.<sup>23</sup>

The positivity assumption stipulates that the probability of receiving treatment is positive (i.e. non-zero) for all combinations of observed confounders.<sup>24</sup> This may not be the case if the confounders are very strong predictors of treatment.<sup>25</sup>

In this project I will focus on the conditional exchangeability assumption (i.e., no unmeasured confounders), and on how we can both investigate and relax the assumption in pharmacoepidemiological studies.

## **1.2 Quantitative bias analysis methods for assessing sensitivity of results to unmeasured confounding**

### **1.2.1 Overview**

When all confounders are measured, we can control for them through study design or analysis. However, in pharmacoepidemiological studies, which are frequently conducted in electronic health record or insurance claims databases, there are often potential confounders that are not available to the study investigator.

To quantify potential bias due to these unmeasured confounders we can use quantitative bias analysis methods. These sensitivity analysis methods allow an investigator to quantify the potential impact on study results of bias due to measurement error/misclassification, unmeasured confounding, and selection bias.<sup>26</sup>

### **1.2.2 Early quantitative bias analysis methods**

The earliest quantitative bias analysis methods for unmeasured confounding were developed in the 1950s and 1960s.<sup>27</sup> One of the earliest methods was published by the epidemiologist Jerome Cornfield in a report looking at the association between smoking and lung cancer.<sup>27</sup> The eminent statistician Ronald Fisher, himself a prolific smoker, had suggested that an

unmeasured genetic predisposing factor might explain the observed association between smoking and lung cancer.<sup>28</sup> Cornfield in his report presented his finding that a risk ratio between a binary exposure and a binary unmeasured confounder must be at least as large as the observed risk ratio between exposure and binary outcome, in order for it to entirely explain the observed association. In his words: “Thus, if cigarette smokers have 9 times the risk of non-smokers for developing lung cancer, and this is not because cigarette smoke is a causal agent, but only because cigarette smokers produce hormone X, then the proportion of hormone-X-producers among cigarette smokers must be at least 9 times greater than that of non-smokers.” We can depict this condition algebraically with:

- $Z$  - the exposure
- $U$  - the unmeasured confounder
- $Y$  - the outcome
- $RR_{ZU}$  - the risk ratio between exposure and unmeasured confounder
- $RR_{ZY}$  - the risk ratio between exposure and outcome

$$RR_{ZU} \geq RR_{ZY} \quad (6)$$

Bross derived another early quantitative bias analysis method.<sup>29</sup> Whereas Cornfield’s method bounded the bias that could arise, Bross presented a formula which allows an investigator to estimate the risk ratio between binary exposure and binary outcome adjusted for a binary unmeasured confounder (assuming no effect modification by exposure on the unmeasured confounder-outcome association). I have depicted this formula below using the following notation:

- $RR_{ZY}^{BiasAdj}$  - the bias-adjusted risk ratio between exposure and outcome
- $RR_{ZY}^{Obs}$  - the observed association between exposure and outcome
- $P_{exp}$  - the prevalence of the unmeasured confounder amongst the exposed group
- $P_{unexp}$  - the prevalence of the unmeasured confounder amongst the unexposed

$$RR_{ZY}^{BiasAdj} = RR_{ZY}^{Obs} / \frac{P_{exp}(RR_{UY} - 1) + 1}{P_{unexp}(RR_{UY} - 1) + 1} \quad (7)$$



To apply the formula, we must specify values for the unknown parameters  $P_{exp}$ ,  $P_{unexp}$  and  $RR_{UY}$ . We can do this based on the literature, expert opinion, or from validation studies where we collect more detailed information from a subset of the study population.<sup>30, 31</sup>

### 1.2.3 Bias formulas

These two early methods provide examples of two schools of quantitative bias analysis: bias formulas and bounding methods. With bias formulas we specify sufficient information about the unmeasured confounder to adjust an observed estimate for the unmeasured confounding. With bounding methods, we leave some of this information unspecified (e.g., prevalence of the unmeasured confounder), and instead calculate the maximum bias possible in a given setting. If the maximum bias possible is insufficient to explain our observed finding, then our results are robust to this bias.

More general bias formulas have since been derived for binary, categorical and continuous unmeasured confounders, and for both marginal and conditional mean differences, risk differences, risk ratios, and odds ratios.<sup>32, 33</sup> Unless simplifying assumptions are made, these formulas can be fairly complicated to specify. For example, if we consider a binary treatment with levels  $z_1$  and  $z_0$ , a set of measured covariates  $X$ , and a categorical unmeasured confounder  $U$  with reference level  $u'$ , then the difference between the causal and observed conditional mean difference is given by:

$$\begin{aligned} & \sum_u \{E(Y|z_1, x, u) - E(Y|z_1, x, u')\} \{P(u|z_1, x) - P(u|x)\} \\ & - \sum_u \{E(Y|z_0, x, u) - E(Y|z_0, x, u')\} \{P(u|z_0, x) - P(u|x)\} \end{aligned} \quad (8)$$

To use this formula, we must specify how the outcome is associated with the unmeasured confounder for each level of treatment and for each level of measured covariates. We must also specify, conditional on measured covariates, how the prevalence of the unmeasured confounder differs between treatment groups. We can, for all these bias formulas, make simplifying assumptions, which make the formulas more amenable to specification.<sup>32</sup> These simplifying assumptions, for example that there is no effect modification of the unmeasured confounder-outcome association by the exposure, can often be reasonable.

### 1.2.4 Bounding methods

Bounding methods are further methods for assessing the sensitivity of results to bias, which require us to specify less information than bias formulas. However, the price we pay for this is that we no longer calculate an estimate adjusted for bias, but instead only quantify the worst-case bias possible given specified information.

For example, Cornfield demonstrated that to fully explain an observed risk ratio of 9, an unmeasured confounder would have to be at least 9 times more common in the exposed group.<sup>27</sup> However, if an unmeasured confounder was 9 or more times more common in the exposed group, we could not say whether or not unmeasured confounding would or would not fully explain the observed association, only that it possibly could.

Schlesselman demonstrated that it was not just the risk ratio between exposure and unmeasured confounder that must be greater than the observed association to potentially fully explain an observed association.<sup>34</sup> It is also the association between unmeasured confounder and outcome.

$$RR_{UY} \geq RR_{ZY} \quad (8)$$

Collectively, these two criteria have been referred to as Cornfield conditions.<sup>35</sup> They also hold when specified conditional on a set of measure covariates  $X$ .<sup>35</sup>

$$RR_{UY|X} \geq RR_{ZY|X} \quad (9)$$

$$RR_{ZU|X} \geq RR_{ZY|X} \quad (10)$$

Furthermore, we can apply these criteria to the odds ratio if the outcome is rare, or to the hazard ratio if the outcome is rare at the end of follow-up.<sup>36</sup>

More recently, a bounding method known as the E-value was proposed by Ding and Vanderweele<sup>36-38</sup>, and this has become very popular.<sup>39</sup> Ding and Vanderweele demonstrated that the bias-adjusted association must meet the following criterion:

$$RR_{ZY|X}^{\text{BiasAdj}} \geq RR_{ZY|X}^{\text{Obs}} / \frac{RR_{ZU|X} \times RR_{UY|X}}{RR_{ZU|X} + RR_{UY|X} + 1} \quad (11)$$

For given hypothesised values of the association between exposure and unmeasured confounder,  $RR_{ZU|X}$ , and between unmeasured confounder and outcome,  $RR_{UY|X}$ , we can

calculate a minimum bias-adjusted value. If, when applied to the confidence intervals, the resulting minimum bias-adjusted interval excludes null, then we can exclude the specified unmeasured confounder from being the sole explanation for the observed association.

The E-value itself refers to a particular corollary of Ding and Vanderweele’s formulas. The E-value is the value which either the association between exposure and unmeasured confounder,  $RR_{ZU|X}$ , or the association between unmeasured confounder and outcome,  $RR_{UY|X}$ , must be equal to or exceed, in order to potentially fully explain an observed association.<sup>37</sup> Expressed algebraically, this criterion is:

$$\max(RR_{ZU|X}, RR_{UY|X}) \geq RR_{ZY|X}^{Obs} + \sqrt{RR_{ZY|X}^{Obs}(RR_{ZY|X}^{Obs} - 1)} \quad (12)$$

Bounding methods including E-values have come under criticism.<sup>40-43</sup> Partly, this is because their ease of use encourages incorrect application and interpretation.<sup>40</sup> Unlike bias-adjustment methods, which provide a bias-adjusted effect estimate, a bound can be difficult to interpret.<sup>44, 45</sup> If it is plausible that there is an unmeasured confounder associated with exposure or outcome as strongly as the E-value, this does not necessarily mean that the results are biased because unmeasured confounder prevalence is not specified.<sup>46</sup> Ioannidis and colleague criticised the E-value for providing limited additional information, given that it is a simple function of the observed effect estimate.<sup>40</sup>

### **1.2.5 Probabilistic and Bayesian bias analysis**

When using bias formulas, we can specify a single value or a range of plausible values for the unknowns. We are rarely confident enough in a single value for each unknown to adopt the former approach. An alternative approach, employed in both probabilistic and Bayesian bias analysis, is to specify probability distributions for the unknowns.<sup>47-49</sup>

In probabilistic bias analysis, also known as Monte Carlo sensitivity analysis, a distribution for the unknown values is specified by the investigator (e.g. log normal, triangular, uniform, trapezoidal etc.) based on their belief regarding plausible values, which is ideally informed by information collected in a validation study or published in the literature.<sup>26</sup> Values are then drawn repeatedly at random from this distribution and used with bias formulas to generate a distribution of bias-adjustment estimates.

Bayesian bias analysis similarly relies on the specification of probability distributions pertaining to the unknown parameters, but also requires prior probability distributions for

parameters with observable estimates (e.g. the log odds ratio between exposure and outcome).<sup>50-52</sup> Furthermore, fully Bayesian bias analysis uses Bayes' rule to combine probability distributions with the likelihood obtained from the observed data, in order to obtain posterior probability distributions for the parameters of interest.

### **1.2.6 Other approaches**

A number of other quantitative bias analysis methods have been developed, but these have seen even more limited application in epidemiology.<sup>53-63</sup> Rosenbaum developed a quantitative bias analysis method for significance tests in matched data.<sup>64, 65</sup> An alternative approach established by Rosenbaum and further developed by Imbens is to modify the joint likelihood function for exposure and outcome.<sup>66, 67</sup>

If we have validation data in a subset of the study population in which the confounder is measured, then we can use propensity score calibration to adjust the propensity score estimated in the overall study population for this confounder.<sup>68</sup> This does, however, typically rely on a surrogacy assumption that the biased propensity score is independent of the outcome given the true propensity score, which will not necessarily be the case in practice.<sup>69,</sup>  
70

### **1.2.7 Application of quantitative bias in the literature**

A systematic review of quantitative bias analysis applied in the literature by Petersen and colleagues found only 238 studies applying these techniques in epidemiological studies between 2006 and 2019, the majority of which (57%) applied techniques for misclassification rather than unmeasured confounding.<sup>71</sup> The relative lack of usage is likely in part due to a lack of knowledge of the methods in the epidemiology community and a lack of training in their application. Even where they are used, usage is often not optimal. For instance, a separate systematic review of probabilistic bias analysis found that most studies did not specify the range of plausible estimates for the bias parameters.<sup>49</sup> Lash and colleagues similarly identified suboptimal application of quantitative bias analysis in the literature, for example not considering random error in the calculation and interpretation of bias-adjusted estimates.<sup>72</sup>

## **1.3 Proton pump inhibitors and mortality**

### **1.3.1 Proton pump inhibitors**

Proton pump inhibitors (PPIs) are a class of acid-suppression medication prescribed for a number of different indications including: treatment of gastroesophageal reflux disease (GORD); treatment and prevention of peptic ulcers; eradication of *H.pylori* infection; and prophylaxis to prevent drug-induced gastrointestinal damage, such as that due to non-steroidal anti-inflammatory drugs (NSAIDs).<sup>73</sup> The class contains the drugs omeprazole, lansoprazole, pantoprazole, esomeprazole, and rabeprazole.<sup>74</sup> All PPIs reduce the acidity of the stomach through inhibition of proton pumps on the inner surface of the stomach.

### **1.3.2 Proton pump inhibitor utilisation**

PPIs are very commonly prescribed in the United Kingdom (UK), US and Europe with one cross-sectional study conducted in the UK Clinical Practice Research Datalink (CPRD) GOLD primary care database estimating that 15% of adults were prescribed a PPI in 2014.<sup>75-77</sup> Prescribing remains very common with ~70 million items prescribed in English primary care over the year June 2021-May 2022.<sup>78</sup> In a UK drug utilisation study of 1.7 million treatment courses prescribed between 1990 and 2014 the most common indications of PPIs were dyspepsia (35.8%), uncomplicated GORD (28.9%), NSAID prophylaxis (7.7%), and gastritis and duodenitis (7.3%).<sup>75</sup>

### **1.3.3 Acid suppression therapy**

PPIs are not the only drug indicated for acid suppression. There are several different medications with different mechanisms of action. Antacids can be used to neutralise stomach acid, but are only a short-acting therapy.<sup>79</sup> H<sub>2</sub> receptor antagonists (H<sub>2</sub>RAs) are another class of acid suppression medication which are antagonists to the H<sub>2</sub> receptors in the stomach that stimulate acid production.<sup>80</sup> PPIs are a newer class of medication that more directly inhibit stomach acid production. They are a more effective acid suppressant than H<sub>2</sub>RAs and have a longer duration of action.<sup>81, 82</sup> H<sub>2</sub>RAs have limited action after meals and efficacy can attenuate over time on treatment.<sup>82</sup> These considerations are likely to influence the choice of which drug to prescribe and potentially make the two treatment groups quite different. While H<sub>2</sub>RAs are a more appropriate comparator to PPIs than antacids, it is likely that the treatment groups are not fully exchangeable.

### **1.3.4 Proton pump inhibitor safety**

Non-interventional studies have identified associations between prescribing of PPIs and a wide range of adverse health outcomes including, but not limited to, liver disease<sup>83-85</sup>, cardiovascular disease<sup>86</sup>, chronic obstructive pulmonary disease (COPD) exacerbations<sup>87</sup>, gastric cancer<sup>88</sup>, kidney disease<sup>89</sup>, and community-acquired pneumonia.<sup>90</sup> However, for many of these associations causality is not clear due to potential unmeasured confounding.

For instance, there had been concerns that an interaction between clopidogrel, an antiplatelet drug, and PPIs might lead to adverse cardiovascular outcomes.<sup>91-93</sup> However, Douglas and colleagues found that though an association was observed between joint clopidogrel and proton pump inhibitor prescribing and death or incident myocardial infarction in a cohort study (hazard ratio [HR] 1.37, 95% confidence interval [CI] 1.27-1.48), in a self-controlled case series, a design which inherently controls for time-invariant confounding, no adverse association was observed (rate ratio 0.75, 0.55-1.01).<sup>94</sup>

PPIs were associated with increased all-cause mortality in a 2017 cohort study conducted using US Department of Veteran Affairs data.<sup>95</sup> Xie and colleagues found that new users of PPIs were at elevated risk of death compared to new users of H2 receptor antagonists [H2RAs] (adjusted hazard ratio [aHR] 1.25, 1.23-1.28).<sup>95</sup> Elevated risk remained after adjusting for a high-dimensional propensity score and in two-stage residual inclusion estimation, strengthening the case for a causal relationship.

Following on from this study these investigators published another cohort study in 2019, again using Veteran Affairs data, where they studied the association between proton pump inhibitor prescribing and cause-specific mortality.<sup>96</sup> Study investigators found increased risk of death due to circulatory system diseases, infectious and parasitic diseases, and genitourinary disease. Looking at particular causes, PPIs were associated with increased mortality due to cardiovascular disease, chronic kidney disease, and upper gastrointestinal cancer.

While use of PPIs was associated with increased mortality in these two non-interventional studies, a placebo-controlled randomised trial did not produce concordant findings. In a randomised controlled trial of 17,598 patients with stable cardiovascular disease or peripheral artery disease randomised to receive the PPI pantoprazole or placebo and followed for a median of 3.01 years, there was no evidence of increased risk of all-cause mortality (HR

1.03, 95% CI 0.92-1.15), cardiovascular mortality (HR 1.03, 95% CI 0.89-1.20), or non-cardiovascular mortality (HR 1.02, 0.87-1.21).<sup>97</sup> Except for an increased risk of enteric infections, there was no evidence for elevated risk from outcomes previously associated with PPIs in non-interventional studies, including chronic kidney disease, dementia, pneumonia, fracture and COPD. The discrepancy between the findings from non-interventional and randomised interventional studies indicate that this may be a drug safety area where non-interventional studies are vulnerable to strong unmeasured confounding. While the trial findings do not exclude a long-term effect of PPIs, they do conflict with short term associations observed in published non-interventional studies. For example, in the study by Xie and colleagues, mortality was increased within the first 6 months following prescription.<sup>95</sup>

### **1.3.5 Potential unmeasured confounding in non-interventional studies**

Patients on acid suppression can be unwell for many reasons. It may be that due to other illnesses these patients need NSAIDs, and hence also need acid suppression for gastroprotection from these NSAIDs.<sup>98</sup> Furthermore, severely ill patients also require gastroprotection from stress ulcers.<sup>99</sup> Given that PPIs are a more effective medication, prescribers may issue PPIs to less healthy patients. It is difficult in routinely collected databases to capture the presence and severity of all illnesses that increase mortality and may be associated with PPI prescribing, or to capture the underlying frailty of patients, and for this reason non-interventional studies may be subject to bias due to residual confounding.

## **1.4 Fluoroquinolones and risk of uveitis, retinal detachment, peripheral neuropathy, and hospitalisation with aortic aneurysm or dissection**

### **1.4.1 Fluoroquinolones**

Fluoroquinolones are a group of antibiotics prescribed for the treatment of a number of infections including respiratory tract, urogenital and skin infections.<sup>100</sup> They act by disrupting bacterial DNA replication through inhibition of the Type II topoisomerases gyrase and topoisomerase IV.<sup>101</sup> Commonly prescribed drugs in the class include ciprofloxacin, levofloxacin, moxifloxacin, ofloxacin, and norfloxacin.<sup>102</sup>

### **1.4.2 Fluoroquinolone utilisation**

A study investigating the utilisation of fluoroquinolones in the UK and European Economic Area provided evidence on which fluoroquinolones are prescribed in the UK, the indications

for which they are prescribed, and trends in their prescribing between 2000 and 2015.<sup>102</sup> In the UK, ciprofloxacin was the most commonly prescribed fluoroquinolone, accounting for 89.4% of fluoroquinolone prescriptions. Most commonly in the UK fluoroquinolones were prescribed for urinary tract infections [UTIs] (33.5% of fluoroquinolone prescriptions), lower respiratory tract infections (23.2%), and gastrointestinal infections (12.9%). Prescribing of fluoroquinolones overall, and in particular for uncomplicated urinary tract infection (UTI), has decreased in the UK and internationally over the last decade.<sup>102-104</sup> More recently, for the year June 2017-May 2018 there were 649,635 items prescribed in English primary care, which decreased to 478,743 items for June 2021-May 2022.<sup>78</sup> This decline has been precipitated by concerns around fluoroquinolone safety, and to mitigate the problem of antimicrobial resistance observed with broad-spectrum antibiotics such as fluoroquinolones.<sup>105-107</sup>

### **1.4.3 Antibiotics**

Fluoroquinolones are one of several classes of antibiotic available in primary care for the treatment of infections. Other antibiotics that are frequently prescribed include penicillins, macrolides, sulphonamides and trimethoprim, tetracyclines, and nitrofurantoin.<sup>100</sup> Not all antibiotics are used for the same indications.<sup>100, 102</sup> Fluoroquinolones are prescribed for a range of infections - most frequently for urinary tract infections, coughs, lower respiratory tract and gastrointestinal tract infections, and least frequently for acne, sore throat and upper respiratory tract infections. Other antibiotics are used quite differently, such as amoxicillin which is often used to treat coughs and ear infections. Identifying an appropriate comparator is challenging given the broad range of infections which fluoroquinolones have been used to treat. One potential comparator is cephalosporins, which are also used, similarly to fluoroquinolones, for urinary tract infection, lower respiratory tract infection and gastrointestinal infections. Furthermore, both fluoroquinolones and cephalosporins are broad-spectrum antibiotics, and as such, given concerns of antibiotic resistance, both antibiotics have similarly seen prescribing decline and been increasingly restricted to second-line usage.<sup>108, 109</sup>

### **1.4.4 Fluoroquinolone safety**

Early safety concerns regarding fluoroquinolones emerged as a result of case reports linking fluoroquinolone prescribing to tendonitis and tendon rupture.<sup>110-113</sup> Subsequent observational studies similarly reported elevated risk of tendon injury.<sup>114</sup> More recently, further concerns



over the safety of fluoroquinolones have arisen due to non-interventional studies finding associations between fluoroquinolone prescribing and uveitis, retinal detachment, peripheral neuropathy, and hospitalisation with aortic aneurysm or aortic dissection (AA/AD).<sup>115-118</sup>

The mechanism of tendon rupture with fluoroquinolones is thought, based on animal studies and other laboratory studies, to be due to the effect of fluoroquinolones on collagen.<sup>119, 120</sup>

Non-interventional studies have identified associations with, retinal detachment and AA/AD, which are also conditions in which collagen is important.<sup>121</sup> In contrast, peripheral neuropathy and uveitis were identified as potential adverse events due to case reports.<sup>122, 123</sup>

#### **1.4.5 Regulatory action**

Safety concerns have led to regulatory action from both the European Medicines Agency (EMA) and the United States Food and Drug Administration (FDA). The FDA first added a boxed warning to fluoroquinolone product labelling regarding increased risk of tendonitis and tendon rupture in 2008.<sup>124</sup> Subsequently, in 2011 the FDA added warnings to labelling with regard to risk of worsening symptoms of myasthenia gravis<sup>125</sup>, and in 2013 regarding risk of peripheral neuropathy.<sup>126</sup> In 2016 the FDA increased warnings regarding potential side effects involving tendons, muscles, joints, nerves, and the central nervous system and recommended that fluoroquinolones be used only when there are no alternatives.

Furthermore, in 2018 the FDA added warnings to labelling with regard to potential mental health side effects, blood sugar disturbances, and increased risk of aortic aneurysm with fluoroquinolone use.<sup>127, 128</sup>

The EMA coordinated a review into fluoroquinolone safety which concluded in 2018.<sup>129</sup> As a result of this review the EMA's safety committee recommended that fluoroquinolones should only be used for severe infections or when other antibiotics cannot be used. Safety warnings were added to the product information for potential side effects involving tendons, muscles, joints, and the nervous system.

In this thesis the health outcomes to be investigated in relation to fluoroquinolone safety are uveitis, retinal detachment, peripheral neuropathy, and AA/AD. In the remainder of this section (1.4) I will introduce each of these different outcomes.

#### **1.4.6 Uveitis**

Uveitis is a medical condition pertaining to inflammation of the uvea. The uvea refers to the iris, ciliary body and choroid within the eye.<sup>130</sup> The location of the inflammation in the eye

may be anterior (iritis, anterior cyclitis, and iridocyclitis), intermediate (cyclitis, vitritis, and pars planitis), posterior (choroiditis, retinitis) or occur throughout the eye (panuveitis).<sup>130</sup> Anterior uveitis represents the majority of cases in the UK.<sup>131</sup> Symptoms may include pain, photophobia, tearing, and floaters and blurred vision.<sup>132</sup> Uveitis can be either chronic or acute.<sup>130</sup> Treatment typically involves immunosuppression using corticosteroids as well as treatment of any underlying cause.<sup>130</sup>

There are many potential causes of uveitis including infectious, genetic, and drug-induced causes. Herpesvirus and toxoplasmosis are common infectious causes.<sup>133</sup> Non-infectious uveitis includes HLA-B27 associated anterior uveitis, Fuch's uveitis syndrome, sarcoidosis-related uveitis, Vogt-Koyanagi-Harada syndrome, and Behcet disease.<sup>134</sup> In a UK case series the most common known aetiologies were Fuch's heterochromic uveitis, sarcoidosis-related uveitis, toxoplasmosis-related uveitis and HLA-B27 related uveitis.<sup>130</sup>

#### **1.4.7 Retinal detachment**

The retina is an inner light-sensitive layer at the back of the eye.<sup>135</sup> Retinal detachment occurs when the retina detaches from the underlying retinal pigment epithelium.<sup>136</sup> It is a medical emergency and should be treated soon after presentation.<sup>137</sup> Symptoms often include light flashes, floaters, blurred vision and peripheral vision field loss.<sup>138</sup> To reattach the detached retina scleral buckling, vitrectomy or pneumatic retinopexy may be used.<sup>139</sup> Retinal detachments can be categorised into three main types: rhegmatogenous, tractional, and exudative or serous.<sup>140</sup> Rhegmatogenous retinal detachments are characterised by a break in the retina.<sup>141</sup> Tractional detachment occurs when the retina is pulled off the retinal pigment epithelium by tractional forces with no retinal break.<sup>141</sup> Exudative or serous detachment occurs due to the accumulation of fluid in the subretinal space without retinal breaks or traction.<sup>141</sup> Rhegmatogenous retinal detachments are much more common than tractional or serous detachment, comprising 92% of 708 retinal detachment surgeries in one Danish study.<sup>142</sup> Estimated incidence of rhegmatogenous retinal detachment between 2007 and 2009 in a Scottish study was estimated to be 12.05 per 100,000 person-years.<sup>143</sup>

Risk factors for rhegmatogenous retinal detachment include age, myopia, prior cataract surgery and prior ocular trauma.<sup>144, 145</sup> In a prospective case series of 1,202 rhegmatogenous retinal detachments in Scotland 21.6% had prior cataract surgery, and of the cases without prior cataract surgery 53.2% were myopic and 10.4% had experienced ocular trauma.<sup>143</sup> Tractional retinal detachments are typically the result of diabetic retinopathy occurring

among individuals with diabetes.<sup>146</sup> Exudative retinal detachment is a potential consequence of ocular inflammation and is associated with Vogt-Koyanagi-Harada syndrome, sympathetic ophthalmia, and undifferentiated choroiditis.<sup>142</sup>

#### **1.4.8 Aortic aneurysm or dissection**

The aorta is a large artery carrying blood from the heart to the rest of the body.<sup>147</sup> Aortic aneurysm occur when the aorta widens.<sup>148</sup> Aortic dissection occurs when blood flowing into the media, the middle layer of the aortic wall, causes separation of the inner layer (intima) from the outer layer (adventitia).<sup>149</sup> Typically, this is caused by a tear in the intima.<sup>149</sup> Aortic aneurysms are typically categorised by their location within the body as either thoracic or abdominal aortic aneurysms.<sup>150</sup> Aortic aneurysms can be asymptomatic, but if the aortic wall ruptures this leads to a medical emergency which can be fatal.<sup>148, 151, 152</sup> It is estimated that abdominal aortic aneurysms lead to 1.3% of all deaths in men aged 65-85 years in developed countries.<sup>153</sup> Treatment of both aortic dissection and ruptured aortic aneurysm involves either open surgical repair or endovascular aneurysm repair.<sup>154</sup>

A US study estimated incidence of aortic dissection to be 4.4 per 100,000 person-years.<sup>155</sup> Incidence estimates for thoracic aortic aneurysm range from 5 to 10 per 100,000 person-years.<sup>150</sup> For abdominal aortic aneurysm incidence varies strongly with age with incidence estimates in developed countries ranging from 40.6 per 100,000 person-years in those aged 50-54 to 203.4 per 100,000 person-years amongst people aged over 80 years.<sup>150</sup> In the UK all men aged 65 years are invited to screening for abdominal aortic aneurysm.<sup>156</sup> A 2019 publication by Public Health England reported that between April 2018 and March 2019 0.97% of men screened were found to have an abdominal aortic aneurysm.<sup>157</sup>

Male sex, increasing age, and smoking are all strong risk factors of abdominal aortic aneurysm.<sup>158-160</sup> Other risk factors include atherosclerosis, hypertension, and a family history of surgery for abdominal aortic aneurysm.<sup>148</sup> Aortic dissection risk factors include smoking, hypertension, older age, dyslipidaemia and genetic disorders such as Marfan Syndrome and Loeys-Dietz syndrome.<sup>149</sup> In a population-based study of all incident aortic dissections in Oxfordshire, England, 67.3% of the 52 aortic dissections were among patients with hypertension, many of whom had uncontrolled hypertension.<sup>161</sup>

#### **1.4.9 Peripheral neuropathy**

Peripheral neuropathy is a medical term used to describe disorders of the peripheral nervous system.<sup>162</sup> It is a broad term that includes radiculopathies, plexopathies, mononeuropathies, and polyneuropathies.<sup>162</sup> Radiculopathy describes a condition where the nerve root in the spinal column is pinched.<sup>163</sup> Plexopathy refers to disorders of the nerves in the brachial or lumbosacral plexus.<sup>164</sup> Mononeuropathies are disorders of single peripheral nerves, whereas polyneuropathies are disorders of multiple peripheral nerves.<sup>162</sup>

Polyneuropathy has been associated with fluoroquinolone prescribing in both case reports and epidemiological studies.<sup>116, 165, 166</sup> Polyneuropathy typically presents with numbness, tingling, pain, and weakness.<sup>167</sup> It often has a ‘stocking and glove’ presentation whereby hands and lower limbs are most commonly affected.<sup>168</sup> Diabetes and alcohol overconsumption are common causes of polyneuropathy.<sup>167</sup> Other risk factors include HIV infection, vitamin B12 deficiency, and sarcoidosis.<sup>169</sup> In a Dutch population-based study incidence among adults of polyneuropathy was 77.0 per 100,000 person-years and the most common diagnoses were diabetic polyneuropathy (32%), cryptogenic axonal polyneuropathy (26%), toxic polyneuropathy (14%), and immune-mediated polyneuropathy (9%).<sup>167</sup>

#### **1.4.10 Potential unmeasured confounding in non-interventional studies**

Fluoroquinolones are prescribed to treat acute infections. One potential explanation for observed associations between fluoroquinolone use and these health outcomes is that incidence of the outcome is elevated due to the infection itself, or to the underlying health status that makes the individual prone to infection. Type and severity of infection is poorly recorded in routinely collected healthcare data such as electronic health records and insurance claims data. Uveitis is a diverse disease with a myriad of aetiologies including infection and immune-related mechanisms that could be non-causally associated with fluoroquinolone prescribing.<sup>130</sup> Tractional retinal detachments are linked to diabetes, and peripheral neuropathy can be a symptom of prediabetes.<sup>170, 171</sup> Prediabetes and glycaemic control in diabetes are poorly captured in many routinely collected healthcare datasets, and may have a causative association with infections that are then treated with fluoroquinolones. Aortic aneurysm can become infected, which can lead to severe clinical outcomes such as rupture which require hospitalisation, which is then confounded with the use of an antibiotic to treat the infection.<sup>172</sup> While all antibiotics treat infections, there are differences in the severity and

type of infection that different antibiotics are prescribed to treat<sup>100</sup>, which may lead to unmeasured confounding in non-interventional studies.

## **1.5 Aim, rationale and objectives**

### **1.5.1 Aim**

The overall aim of this thesis is to identify methods to handle unmeasured confounding, and apply them to pharmacoepidemiological studies investigating two drug safety issues: the association between prescribing of PPIs and mortality, and the association of fluoroquinolone prescribing with uveitis, retinal detachment, peripheral neuropathy and AA/AD.

### **1.5.2 Rationale**

In pharmacoepidemiological studies confounding is a major concern, given that users of a particular drug often differ substantially from non-users or from users of alternative medications. While efforts are typically made to adjust for all measured confounders, there can often be unmeasured or partially measured confounders that may bias study results.

Previous research has produced conflicting findings for the two drug safety issues under investigation in this thesis. The causality of observed associations is unclear due to potential unmeasured confounding. Therefore, these are topic areas where understanding and applying methods for handling unmeasured confounding will be valuable.

### **1.5.3 Objectives**

1. To review quantitative bias analysis methods which allow us to quantitatively assess the sensitivity of study results to unmeasured confounding (Chapters 1 & 4).
2. To review the evidence from previous epidemiological studies on the association between fluoroquinolones and uveitis, retinal detachment, peripheral neuropathy, and AA/AD (Chapter 2). A similar review of the literature is not presented for PPIs, in view of the much smaller existing literature on PPIs and mortality.
3. To estimate the association between PPIs and both all-cause and cause-specific mortality, through a cohort study (Chapter 5).
4. To estimate the association between fluoroquinolones and risk of uveitis, retinal detachment, peripheral neuropathy, and AA/AD in a cohort study, and also using self-controlled study designs (Chapter 6-8).

5. To compare results from the fluoroquinolone cohort study to those obtained from self-controlled studies with active comparators, which should inherently by design minimise both time-invariant and time-varying unmeasured confounding (Chapter 6-8).
6. To investigate the potential role of unmeasured confounding in observed associations, in both the PPI and fluoroquinolone studies, through the use of secondary and sensitivity analyses, including quantitative bias analysis (Chapters 5-8).

#### **1.5.4 Thesis structure**

This thesis consists of a background section, a literature review, a methods section, five research papers, and a discussion chapter.

1. Chapter 1 (the present chapter) provides a background to the thesis, including a review of confounding, quantitative bias analyses for unmeasured confounding, and the two safety topics under investigation.
2. Chapter 2 is a literature review evaluating prior evidence on the associations between fluoroquinolones and uveitis, retinal detachment, peripheral neuropathy, and AA/AD.
3. Chapter 3 provides detailed coverage of the data sources, introduces the non-interventional studies I conducted, and outlines the methods I used in these studies to handle potential unmeasured confounding.
4. Chapter 4 is a research paper outlining the use of quantitative bias analysis to evaluate the robustness of research results to residual bias, including unmeasured confounding.
5. Chapter 5 is a published research paper presenting the results of a cohort study investigating the association between PPIs and mortality. To diagnose potential unmeasured confounding I use several methods, namely negative control outcomes; a secondary comparator group; the high dimensional propensity score for covariate adjustment; and sensitivity analysis varying the observation period. To quantify potential bias due to unmeasured confounding I calculate E-values, which are a form of quantitative bias analysis.
6. Chapter 6 is a research paper presenting the results of cohort and case-crossover studies estimating the association between fluoroquinolones and AA/AD. To reduce potential confounding I use a self-controlled study design, the case-crossover study, which by design eliminates confounding by time-invariant unmeasured confounders.

7. Chapter 7 is a research paper presenting the findings of a cohort study investigating the association between fluoroquinolones and peripheral neuropathy. In order to quantify the sensitivity of results to a potential unmeasured confounder I perform two types of quantitative bias analysis, calculation of E-values and Cornfield conditions.
8. Chapter 8 is a research paper presenting the findings of cohort studies and self-controlled case series estimating the association between fluoroquinolones and retinal detachment and uveitis. To eliminate confounding by time-invariant unmeasured confounders, and thereby reduce unmeasured confounding, I use the self-controlled case series design.
9. Chapter 9 provides a discussion in which I bring together the findings from the separate research papers. I appraise the results of the studies conducted in light of methods used to reduce, diagnose, and quantify potential unmeasured confounding. Finally, I present the conclusions of the thesis.

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## CHAPTER 2. LITERATURE REVIEW

### Overview

In this chapter I review the published literature to address the following question.

1. What prior evidence is there for associations between fluoroquinones use and incidence of uveitis, aortic aneurysm or aortic dissection, retinal detachment, and peripheral neuropathy?

Initially, I outline the methods I used to systematically search the literature. Then, I detail the results of the literature search, and the findings from the included publications. To conclude the chapter, I appraise the extent to which the published literature indicates a causal association between fluoroquinolones and the studied outcomes.

## **2.1 Literature search**

### **2.1.1 Overview of search**

I conducted a systematic literature search to identify published epidemiological studies reporting on the associations between the exposure, fluoroquinolones, and incidence of one of the following outcomes:

- (1) uveitis
- (2) aortic aneurysm or dissection diagnosis or hospitalisation
- (3) retinal detachment
- (4) peripheral neuropathy.

I limited the search to epidemiological studies conducted in human populations, excluding case reports, but did not limit the search to any specific human population or comparator exposure.

### **2.1.2 Search terms**

A search query was constructed to identify publications referring to fluoroquinolones by class name, substance name, or brand name and referring to one of the four studied outcomes.

The search query, which was run on publication titles and abstracts, was:

("\*fluoroquinolone\*" or "\*floxacin\*" or "ciproxin" or "cipro" or "baxdela" or "avelox" or "floxin") and ("\*uveitis" or "aortic\*" or "retina\*" or "dissection\*" or "aneurysm\*" or "\*neuropath\*"). Asterisks indicate wild card symbols which will match with a sequence of zero or more of any characters.

### **2.1.3 Databases searched**

I searched MEDLINE (Medical Literature Analysis and Retrieval System Online) and EMBASE (Excerpta Medica Database). The versions of these databases that I searched were Ovid MEDLINE and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations, Daily and Versions, and EMBASE Classic+EMBASE on February 19<sup>th</sup> 2022. The search was rerun on 31<sup>st</sup> March 2023 to identify any additional papers that have been published since the initial search.

## **2.2 Results of search**

### **2.2.1 Identified publications**

The search identified 401 publications in EMBASE and 226 publications in MEDLINE. Of these 203 were duplicates, leaving 424 publications for title and abstract review. A single reviewer (JPB) reviewed each title and abstract, identifying 63 potentially relevant publications. The primary reason for exclusion of each abstract is presented in Figure 2.1.

A single reviewer (JPB) reviewed the full text of these 63 publications, identifying 36 publications for inclusion. The primary reason for exclusion at the full-text stage is presented in Figure 2.1.

A further search on the 31<sup>st</sup> of March 2023 revealed four additional new articles published since the original search query was run bringing the total number of included publications to 40.

### **2.2.2 Included studies**

Of the included publications, three investigated uveitis, seventeen aortic aneurysm or dissection, seventeen retinal detachment, and four peripheral neuropathy. These totals include one publication which examined risk of both retinal detachment and aortic aneurysm or dissection.

## **2.3 Findings**

### **2.3.1 Uveitis**

Three non-interventional studies estimating the association between fluoroquinolone use and uveitis were identified.<sup>1-3</sup> Basic details of these studies are presented in Table 2.1.

Following on from a number of case reports of bilateral uveitis associated with moxifloxacin, a nested case-control study was conducted by Forooghian and colleagues to investigate this potential association (published in 2013).<sup>2, 4</sup> Although an association between fluoroquinolones and uveitis was found (adjusted rate ratio [aRR] 3.53, 95% CI 2.84-4.39 for current use (i.e. within previous 30 days); adjusted rate ratio for past use within one year 1.95, 95% CI 1.72-2.20), the rate was also higher though to a lesser extent for other antibiotics, namely beta-lactams (aRR for current use 1.36, 95% CI 1.01-1.84) and oral macrolides (aRR for current use 2.37, 95% CI 1.76-3.20). The authors concluded that the study did not provide convincing evidence for a causal association, and that given the

association with other antibiotics, confounding by indication may be the cause of the observed association. A limitation of this study was that it did not look at specific fluoroquinolone drugs.

A second nested case-control study was published in 2015 by Eadie et al., which concluded that there was increased risk with the fluoroquinolone moxifloxacin (aRR 2.98, 95% CI 1.80-4.94 for current first time use i.e. within 15 days) and ciprofloxacin (aRR 1.96, 95% CI 1.56-2.47), but not levofloxacin.<sup>1</sup> The rate was higher for first time users, but remained elevated for recent users of ciprofloxacin. However, this study only used one control exposure (finasteride) which is not an antibiotic, and not used for similar indications to fluoroquinolones. Furthermore, authors only adjusted for three different systemic diseases associated with uveitis.

A subsequent cohort study (2016) of 4,387,651 patients by Sandhu and colleagues compared the incidence of uveitis between fluoroquinolone and beta-lactam users. Patients were censored if they experienced any one of 18 systemic diseases associated with uveitis. No increased risk with fluoroquinolone usage was observed at 30 (adjusted hazard ratio [aHR] 0.96, 0.82-1.13), 60 (aHR 0.99, 95% CI 0.88-1.12), or 90 (aHR 1.05, 95% CI 0.95-1.16) days, but risk was slightly elevated at 365 days (aHR 1.11, 95% CI 1.05-1.17). Moxifloxacin individually was associated with increased hazard when compared to beta-lactams (aHR within 30 days 1.75, 95% CI 1.28-2.37). However, a secondary analysis using systemic disease associated with uveitis (e.g., sarcoidosis, lupus, and inflammatory bowel disease) as the outcome found fluoroquinolones to be strongly associated with these diseases, potentially indicating confounding by indication. The authors concluded that the study did not provide evidence of an association between fluoroquinolones and uveitis.<sup>3</sup> They conclude that one potential explanation for observed associations are that patients with inflammatory conditions could have symptoms that mimic infection and result in prescription (which might also explain the association seen between fluoroquinolones and uveitis-associated systemic illness). Alternatively, they suggest that infectious disease syndromes commonly treated with fluoroquinolones may elicit a lasting immune response that could trigger uveitis, analogous to the way in which acute infections with *Yersinia* or *Salmonella* trigger lasting immune response in reactive arthritis and associated uveitis.

The authors point out that moxifloxacin is typically used for respiratory tract and skin infections, whereas levofloxacin has a broader range of indications, which may lead, due to



differential confounding by indication, to the different findings observed for moxifloxacin versus other fluoroquinolones.

In the broader literature including case reports, it is of note that most case reports (25/40) identified in World Health Organisation (WHO) and FDA databases were related to moxifloxacin.<sup>4</sup> Furthermore, the association between fluoroquinolones and uveitis was greatest for moxifloxacin in the second nested case-control study (Eadie et al.) and in the cohort study (Sandhu et al.). The first cohort study (Forooghian et al.) did not look at individual fluoroquinolones due to limited power. A suggested mechanism is that moxifloxacin concentrates in melanin-containing structures in the meninges, skin, and eyes.<sup>3</sup>

Overall, the evidence for a causal effect of fluoroquinolones on uveitis is weak. While an association was observed by Forooghian et al. in a nested case-control study, risk was also elevated for other antibiotics indicating potential confounding by indication. Sandhu and colleagues found no elevated risk relative to the antibiotic beta-lactams. Though Eadie et al. found an association compared to non-use, they did not examine risk with other antibiotics. The strongest evidence relates to the fluoroquinolone moxifloxacin, but one explanation for this is differential confounding by indication due to different prescribing patterns of moxifloxacin relative to other fluoroquinolones.

### **2.3.2 Retinal detachment**

Nineteen non-interventional studies in seventeen publications were identified examining the association between fluoroquinolone prescribing and retinal detachment.<sup>5-18</sup> Basic study details are presented in Table 2.2. These studies included four nested case-controls studies, seven cohort studies, six self-controlled case series, one case-crossover, and one sequence symmetry analysis.<sup>19</sup>

In 2012 a nested case-control was published in JAMA identifying an association between the use of fluoroquinolones and retinal detachment.<sup>5</sup> The association was observed for current use (aRR [rate ratio] 4.50, 95% CI 3.56-5.70), but not for past or recent use. No association was observed with beta-lactams or short-acting beta-agonists.

Since then, a number of non-interventional studies have been conducted, as have two systematic reviews.<sup>20,21</sup> The most recent systematic review, published in 2016, identified ten observational studies from seven journal articles. Four of these were case-control studies, three were cohort studies, and three self-controlled case series. A meta-analysis revealed a

significant association in the cohort studies (pooled RR [rate ratio] 1.87, 95% CI 1.36-2.58), a non-significant association in the case-control studies (pooled RR 1.99, 95% CI 0.79-4.98), and no evidence of an association in the self-controlled case series (pooled RR 1.03, 95% CI 0.82-1.29). This discrepancy could be potentially explained by time-invariant confounding by indication. Individually, most of the included studies did not find strong evidence for an association.<sup>6-8, 10, 11</sup> Etminan et al., Fife et al, and Kuo et al. reported evidence for an association.<sup>5, 10, 12</sup> The systematic review did not include the findings of a 2013 conference abstract, which found no evidence of an association (aRR 1.26, 95% CI 0.65-2.47) in a self-controlled case series using data from Taiwan, Hong Kong and the United Kingdom.<sup>9</sup> However, in this latter study sample size was small and confidence intervals, as a consequence, were wide.

Since the systematic review there have been further non-interventional studies. In a cohort study of 1,744,360 individuals, there was suggestive evidence that fluoroquinolones were associated with retinal detachment (aHR 1.28, 95% CI 0.99-1.65), but the association was not greater than that observed between retinal detachment and amoxicillin (aHR 1.47, 95% CI 1.08-2.99), indicating potential confounding by indication.<sup>13</sup> A self-controlled case series and case-crossover study published in 2016 did find a significant association between retinal detachment and fluoroquinolones (aOR 1.46, 95% CI 1.15-1.87 for 10 days following prescription), but there were concerns around the study methodology.<sup>15, 22</sup> Furthermore, in the case-crossover study an elevated risk was seen separately for both rhegmatogenous (aOR 1.41, 95% CI 1.04-1.92) and exudative retinal detachment (aOR 2.57, 95% CI 1.46-2.53), while the putative mechanism for an effect of fluoroquinolones pertains to rhegmatogenous retinal detachment, by means of its effect on collagen, rather than exudative retinal detachment, which involves the build-up of liquid in the eye.<sup>15</sup>

Another indication that the observed associations may relate to confounding is a 2016 prospective cohort study of 76 patients prescribed a fluoroquinolone, age and sex matched to 50 unexposed controls.<sup>14</sup> Detailed ocular examinations were performed at baseline, 1 week, and 1 month following index date. These examinations revealed no evidence for a difference in studied retinal characteristics after fluoroquinolone prescribing. However, the study had a very small sample size, so a rare adverse event would not in likelihood be detected.

More recently, a 2018 sequence symmetry analysis found an association between fluoroquinolones and retinal detachment when compared against other antibiotics in South

Korean data (adjusted sequence ratio 1.70, 95% CI 1.61-1.80).<sup>16</sup> A separate 2018 nested case-control study using South Korean data found no association between fluoroquinolones and retinal detachment (aOR 1.00, 95% CI 0.81-1.24).<sup>17</sup>

A self-controlled case series, also conducted in South Korean data, did find an association (aRR 1-30 days following fluoroquinolone prescription 1.85, 95% CI 1.71-1.95), but there was also elevated risk in days 1-30 prior to initiation of fluoroquinolone therapy (aRR 1.58, 95% CI 1.49-1.68), indicating potential time-varying residual confounding.<sup>23</sup>

A recent self-controlled case series conducted in three US insurance claims databases did find an association between any fluoroquinolone prescription and retinal detachment, but did not find evidence for an association when including only oral formulations (i.e., excluding eye drops).<sup>24</sup> The finding of an association with fluoroquinolones when including ocular formulations may be explained by the use of fluoroquinolone eye drops prophylactically prior to cataract surgery, which is itself known to be strongly associated with retinal detachment.<sup>25</sup>

A Canadian cohort study did not find evidence of an association between high dose relative to low dose fluoroquinolones and hospitalisation with retinal detachment, but the study was small and hence confidence intervals were wide (aRR [adjusted risk ratio] 1.78, 95% CI 0.77-4.09).<sup>26</sup> Furthermore, the study population was restricted to individuals with advanced chronic kidney disease, limiting generalisability.<sup>26</sup>

Finally, a recent nested case-control study using US electronic health record data did not find evidence of an association between fluoroquinolone and retinal detachment (aOR 1.27, 0.80-2.01).<sup>27</sup> Study authors highlighted elevated risk in certain subpopulations, including African Americans and individuals aged 56-70, but this subgroup analysis is vulnerable to false discovery due to multiple comparisons.

Overall, while a number of studies comparing to non-use or to amoxicillin found an association, studies comparing to the broader class, beta-lactams, did not.<sup>11,28</sup> This might be explained by confounding by indication resulting in elevated risk of retinal detachment for both fluoroquinolones and beta-lactams other than amoxicillin. In the UK, amoxicillin is much more frequently prescribed, as a proportion of total prescriptions, for respiratory tract infections than are fluoroquinolones.<sup>29</sup> Given the rarity of retinal detachment, as with tendon rupture, any attributable risk is low.<sup>6</sup>

### **2.3.3 Aortic aneurysm or dissection**

Seventeen non-interventional studies were identified examining the association between fluoroquinolone use and aortic aneurysm or dissection.<sup>13, 30-44</sup> Basic study details are presented in Table 2.3. This included four nested case-control studies, six cohort studies, three self-controlled case series and four case-crossover/case-time-control studies.

In general, a consistent positive association between fluoroquinolone use and aortic aneurysm and dissection was observed across studies, and was present in cohort, case-control and self-controlled designs. In a cohort study which separated aortic aneurysm and aortic dissection, there was evidence for an association between fluoroquinolone and aortic aneurysm (aHR 1.90, 95% CI 1.22-2.96), but not aortic dissection (aHR 0.93, 95% CI 0.38-2.29).<sup>42</sup>

Most studies identifying an association used non-use, amoxicillin, or azithromycin as a comparator.<sup>5, 13, 30, 33-40, 42, 44</sup> In contrast, studies using alternative comparators including co-amoxiclav, cephalosporins, and combined trimethoprim with sulfamethoxazole did not report an association.<sup>31-33</sup> A nested-case control study did not find any association when fluoroquinolones were compared to combined co-amoxiclav or combined ampicillin-sulfbactam (adjusted odds ratio [aOR] 1.01, 95% CI 0.82-1.24).<sup>32</sup> A cohort study comparing fluoroquinolones against cephalosporins did not identify an association (aHR 0.86, 95% CI 0.59-1.27).<sup>31</sup> Furthermore, in a cohort study that used both azithromycin and combined trimethoprim with sulfamethoxazole as comparators, an association was observed relative to azithromycin (aHR 2.57, 95% CI 1.36-4.86) but not relative to combined trimethoprim with sulfamethoxazole (aHR 0.99, 95% CI 0.62-1.57).<sup>33</sup> Similarly, in this cohort, in a secondary analysis using amoxicillin as the comparator, the risk of aortic aneurysm or dissection for fluoroquinolones was elevated (aHR 1.54, 95% CI 1.33-1.79). A further self-controlled case series found an elevated rate relative to amoxicillin, azithromycin and doxycycline, but there was no evidence for increased incidence relative to cefuroxime/cephalexin (aRR 1.35, 95% CI 0.81-2.24) or trimethoprim-sulfamethoxazole (aRR 0.81, 95% CI 0.53-1.25). These findings suggest that non-use, amoxicillin, and azithromycin may not be appropriate comparators and that studies using these comparators may be more likely to be biased by residual confounding.

Further indication that there may be time-varying confounding of the association comes from a self-controlled case series which found an elevated rate of aortic aneurysm or dissections in the 60 days prior to fluoroquinolone prescribing.<sup>39</sup>

A recent case-crossover study did not find evidence of an association (aOR 1.33, 95% CI 0.32-3.00) between fluoroquinolone use and risk of aortic aneurysm or dissection, in a case-crossover study in a restricted population of individuals with congenital aortic or Marfan syndrome.<sup>45</sup> The restricted population limits the generalisability and precision of estimates.

Overall, while there is strong evidence for an association, it is not clear that it this association is causal. The presence of an association seems to depend on the comparator chosen, which might be explained by differential confounding due to infection type and severity of infection. When compared to antibiotics used for the most similar indications (e.g., co-amoxiclav, cephalosporins) there was no evidence of an association.

### **2.3.4 Peripheral neuropathy**

Four non-interventional studies (two case-control studies and two cohort studies) were identified looking at the association between fluoroquinolones and peripheral neuropathy.<sup>46-49</sup> Study details are presented in Table 2.4.

Case reports of peripheral neuropathy with fluoroquinolone use led the FDA to require a label change in 2013<sup>50</sup>. Subsequently, Etminan and colleagues conducted a nested case-control study in US claims data to estimate the association, relative to non-use, between fluoroquinolone prescribing and peripheral neuropathy.<sup>50</sup> Current fluoroquinolone users were at higher risk of peripheral neuropathy (aRR 1.83, 95% CI 1.49-2.27).

Baseline characteristics of cases and controls did differ, with higher frequency of chronic renal failure, chronic liver failure, hypothyroidism, and postherpetic neuralgia in the cases. While these were adjusted for, it is not clear whether these variables, alongside the exclusion criteria, are sufficient to control confounding, especially with a non-user comparator. Furthermore, although a negative control exposure, finasteride, was not found to be associated with peripheral neuropathy, this drug is used for very different indications (it is not an antibiotic) and as such is unlikely to be affected by the same confounding by indication.

Morales et al. subsequently published a nested case-control study comparing fluoroquinolone to non-use, in the UK electronic health record dataset The Health Improvement Network (THIN).<sup>49</sup> They found an elevated incidence of peripheral neuropathy (aRR 1.47, 95% CI 1.13-1.92) with fluoroquinolones, but not with a negative control antibiotic co-amoxiclav (aRR 1.10, 95% CI 0.86-1.40). A large number of covariates were adjusted for, including demographic and lifestyle variables, and conditions associated with peripheral neuropathy.

Excluding people with conditions strongly associated with peripheral neuropathy led to a stronger association (aRR 1.64, 95% CI 1.27-2.12). These findings provide more convincing evidence for an association between fluoroquinolones and peripheral neuropathy. However, the possibility for residual confounding remains.

A study published in 2020 by Karol et al. examined, in a prospective cohort study, the risk of peripheral neuropathy associated with fluoroquinolones in children with acute lymphoblastic leukaemia.<sup>48</sup> While there was no evidence of an association (aHR 0.8, 95% CI 0.5-1.04), the highly selective study population makes the generalisability of these findings to adult populations unclear.

A 2021 cohort study by Ellis et al. in US claims data found further evidence for a small association between fluoroquinolones and peripheral neuropathy relative to comparator antibiotic (aHR 1.09, 95% CI 1.07-1.11).<sup>46</sup> The comparator antibiotic exposure was a grouping containing azithromycin, amoxicillin, amoxicillin plus clavulanic acid and cefixime.<sup>46</sup> The study had a number of strengths including stratification by era (pre/post-FDA labelling changes) as well as matching on propensity score within cohorts defined by indication. However, the observed effect size was small and as such could potentially be explained by relatively weak residual confounding.

Outside of the epidemiological literature, there is evidence for a potential association between fluoroquinolones and peripheral neuropathy from randomised controlled trials (RCTs). In a meta-analysis of RCTs the risk of central nervous system (CNS)-related adverse events was elevated for fluoroquinolone relative to macrolides (pooled odds ratio [OR] 1.49, 95% CI 1.02-2.17), cefuroxime axetil (pooled OR 1.77, 95% CI 1.01-3.12) and co-amoxiclav (pooled OR 1.90, 95% CI 1.03-3.51).<sup>51</sup> However, these findings are not separated by specific CNS adverse event.

Overall, the evidence for an association between fluoroquinolones and peripheral neuropathy is consistent across epidemiological studies. There have, however, been few studies and there is always the possibility that all the non-interventional studies conducted to date have been affected similarly by residual confounding.

## **2.4 Summary**

The extent of evidence for a causal association between each outcome and fluoroquinolone prescribing varies by outcome. For uveitis, positive associations were consistently observed,

but an elevated risk with other antibiotics, and an elevated incidence of uveitis-associated systemic illness amongst fluoroquinolone users, are both suggestive of potential residual confounding. For aortic aneurysm or aortic dissection, studies consistently found an association relative to non-use or relative to amoxicillin or azithromycin use, but there are studies using other comparators such as cephalosporins and trimethoprim-sulfamethoxazole which do not find an association. The discrepancy between the findings with different comparators might be explained by confounding by indication. For retinal detachment, there are conflicting findings, with most studies not using an active comparator, which if used could have possibly reduced confounding by indication. In the two studies that used beta-lactams as an active comparator, there was no evidence of an association between prescribing of fluoroquinolones and retinal detachment. There have been few studies looking at peripheral neuropathy, but those few that have been conducted, consistently report associations between fluoroquinolone prescribing and peripheral neuropathy relative to non-use among adults.

Overall, these studies indicate that there is some evidence for an association between fluoroquinolone prescribing and each of the studied outcomes: uveitis, aortic aneurysm or aortic dissection, retinal detachment, and peripheral neuropathy. However, the causality of these associations is not clear, and it appears that an appropriate active comparator is critical to reducing confounding by indication. Infection type and severity are poorly recorded in routinely collected healthcare databases and may lead to unmeasured confounding of the association between fluoroquinolones and outcomes, especially if an appropriate comparator is not chosen.

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## 2.7 Tables

**Table 2.1 Non-interventional studies reporting the association between fluoroquinolones and uveitis**

| Outcome | Authors           | Year published | Design              | Comparator      | Study population  | Country | Data source(s)  | Association between fluoroquinolones and outcome   |
|---------|-------------------|----------------|---------------------|-----------------|---|---------|---|--|
| Uveitis | Forooghian et al. | 2013           | Nested case-control | Non-use         | 3,383 cases<br>33,830 controls                                | Canada  | British Columbia Health Linked Databases linked to PharmaNet (Canada) | <u>Adjusted risk ratio (95% CI):</u><br>3.53 (2.84-4.39)   |
|         | Eadie et al.      | 2015           | Nested case-control | Non-use         | 13,313 cases<br>133,130 controls                              | Canada  | LifeLink health claims database (Canada)                              | <u>Adjusted rate ratios (95% CI):</u><br>Moxifloxacin 2.98 (1.80-4.94)<br>Ciprofloxacin 1.96 (1.56-2.47)<br>Levofloxacin 1.26 (0.90-1.77)        |
|         | Sandhu et al.     | 2016           | New-user cohort     | $\beta$ -lactam | 843,854 prescribed FQ<br>3,542,797 prescribed $\beta$ -lactam | USA     | Clinformatics Data Mart Database (USA)                                | <u>Adjusted hazard ratios (95% CI):</u><br>3 day 0.96 (0.82-1.13)<br>6 day 0.99 (0.88-1.12)<br>9 day 1.05 (0.95-1.16)<br>36 day 1.11 (1.05-1.17) |

**Table 2.2 Non-interventional studies reporting the association between fluoroquinolones and retinal detachment**

| Outcome                    | Authors          | Year published | Design                      | Comparator  | Study population   | Country               | Data source(s)  | Association between fluoroquinolones and outcome   |
|----------------------------|------------------|----------------|-----------------------------|-------------|--|-----------------------|---|--|
| Retinal detachment         | Etminan et al.   | 2012           | Nested case-control         | Non-use     | 4,384 cases<br>43,840 controls                                     | Canada                | British Columbia Linked Health Database   | <u>Adjusted rate ratios (95% CI)</u><br>Current use 4.50 (3.56-5.70)<br>Recent use 0.92 (0.45-1.87)<br>Past use 1.03 (0.89-1.19) |
| Retinal detachment         | Chui et al.      | 2013           | Self-controlled case series | Non-use     | 417 cases in Hong Kong<br>1,002 cases in Taiwan<br>861 cases in UK | China<br>Taiwan<br>UK | Hong-Kong – Clinical Data Analysis and Reporting System<br>Taiwan – National Health Insurance Research Database<br>UK – IMS Disease Analyzer Database | <u>Adjusted rate ratios (95% CI)</u><br>Hong Kong 1.25 (0.41-4.41)<br>Taiwan 1.70 (0.84-3.46)<br>UK 0.65 (0.16-2.63)             |
| Retinal detachment         | Pasternak et al. | 2013           | Cohort                      | Non-use     | 5,164,479 individuals  | Denmark               | Central Person Register<br>National Prescription Registry<br>Danish National Patient Register   | <u>Adjusted rate ratios (95% CI)</u><br>Current use 1.29 (0.53-3.13)<br>Recent use 0.97 (0.46-2.05)<br>Past use 1.37 (0.85-2.35) |
| Retinal detachment         | Chui et al.      | 2014           | Self-controlled case series | Non-use     | 469 cases in Hong Kong<br>947 cases in Taiwan                      | China<br>Taiwan       | Clinical Data Analysis and Reporting System   | <u>Adjusted rate ratio (95% CI)</u><br>Hong Kong 0.82 (0.20-3.36)<br>Taiwan 1.45 (0.68-3.10)<br>Overall 1.26 (0.65-2.47)         |
| Retinal tear or detachment | Eftekhari et al. | 2014           | Cohort                      | Beta-lactam | 3,413,498 individuals  | UK                    | The Health Improvement Network  | <u>Adjusted hazard ratio (95% CI)</u><br>30 day 0.78 (0.11-5.71)<br>90 day 1.25 (0.51-3.08)<br>365 day 1.35 (0.89-2.06)          |

| Outcome   | Authors        | Year published | Design                      | Comparator                    | Study population   | Country | Data source(s)   | Association between fluoroquinolones and outcome   |
|---|----------------|----------------|-----------------------------|-------------------------------|--|---------|--|--|
| Retinal detachment  | Fife et al.    | 2014           | Nested case-control         | Non-use                       | MarketScan<br>7,844 cases,<br>77,654 controls<br>Optum<br>ClinFormatics<br>3,059 cases,<br>30,230 controls | USA     | MarketScan<br>Commercial Claims<br>and Encounters<br>Optum ClinFormatics | <u>Adjusted odds ratios (95% CI)</u><br>MarketScan 1.33 (0.99-.80) –<br>Optum 0.93 (0.48-.81)  |
| Retinal detachment  | Fife et al.    | 2014           | Self-controlled case series | Non-use                       | MarketScan<br>19,191 cases<br>Optum<br>6,896 cases   | USA     | MarketScan<br>Commercial Claims<br>and Encounters<br>Optum ClinFormatics | <u>Adjusted rate ratios (95% CI)</u><br>MarketScan 1.13 (0.99-1.29)<br>Optum 0.85 (0.99-1.01)  |
| Rhegmatogenous retinal detachment   | Kapoor et al.  | 2014           | Cohort study                | Oral macrolide<br>Beta-lactam | 38,046 prescribed<br>FQ<br>48,074 oral<br>macrolide<br>69,079 beta-lactam                                  | USA     | Rochester<br>Epidemiology Project  | <u>Estimated risk</u><br>90 day risk<br>0.01% (0.00-0.03%) FQ<br>0.02% (0.01-0.04%)<br>macrolide<br>0.02% (0.01-0.04%) beta-<br>lactam             |
| Rhegmatogenous retinal detachment   | Kuo et al.     | 2014           | Cohort study                | Amoxicillin                   | 178,179 matched<br>pairs   | Taiwan  | Taiwan National<br>Health Insurance<br>Research Database                 | <u>Adjusted hazard ratio (95% CI)</u><br>2.07 (1.45-2.96)  |
| Retinal detachment  | Daneman et al. | 2015           | Cohort study                | Non-use                       | 1,744,360<br>individuals   | Canada  | Ontario Registered<br>Persons Database                                   | <u>Adjusted hazard ratio (95% CI)</u><br>1.47 (1.08-2.00)  |
| Ocular parameters (visual acuity, intraocular pressure, photostress recovery time, colour vision, etc.) | Cekic et al.   | 2016           | Matched cohort study        | Non-use                       | 76 matched cases<br>50 controls  | Turkey  | Prospective study  | No evidence for differences in ocular parameters on ocular examination at one week or one month in the fluoroquinolone group relative to non-users |

| Outcome                           | Authors          | Year published | Design                      | Comparator | Study population               | Country      | Data source(s)                                     | Association between fluoroquinolones and outcome   |
|-----------------------------------|------------------|----------------|-----------------------------|------------|--------------------------------|--------------|--|--|
| Retinal detachment                | Raguideau et al. | 2016           | Case-crossover              | Non-use    | 27,540 cases                   | France       | SNIIRAM  | <u>Adjusted odds ratios (95% CI)</u><br>Current 1.36 (1.15-1.87)<br>Recent 0.94 (0.78-1.14)<br>Past 1.06 (0.91-1.24)<br>Rhegmatogenous 1.40 (1.03-1.90)<br>Exudative or serous 2.56 (1.46-4.51)<br>Tractional 1.14 (0.40-3.27)                       |
| Retinal detachment                | Raguideau et al. | 2016           | Self-controlled case series | Non-use    | 27,540 cases                   | France       | SNIIRAM  | <u>Adjusted rate ratios (95% CI)</u><br>1.68 (1.36-2.07)   |
| Rhegmatogenous retinal detachment | Baek et al.      | 2018           | Sequence Symmetry Analysis  | Non-use    | 5,234 cases with FQ exposure   | South Korea  | South Korean National Health Insurance Database    | <u>Adjusted sequence ratio (95% CI)</u><br>1.70 (1.61-180)   |
| Rhegmatogenous retinal detachment | Choi et al.      | 2018           | Nested case-control         | Non-use    | 1,151 cases<br>11,470 controls | Taiwan       | South Korean National Health Insurance Database    | <u>Adjusted odds ratio (95% CI)</u><br>1.00 (0.81=1.24)  |
| Rhegmatogenous retinal detachment | Shin et al.      | 2018           | Self-controlled case series | Non-use    | 15,134 cases                   | South Korean | South Korean National Health Insurance Database    | <u>Adjusted rate ratios (95% CI)</u><br>1.85 (1.71-1.95)   |
| Retinal detachment                | Londhe et al.    | 2022           | Self-controlled case series | Non-use    | 40,981 cases                   | USA          | MarketScan CCAE<br>Medicare<br>Optum Clinformatics | <u>Adjusted rate ratios (95% CI)</u><br>Exposure including eye drops:<br>Optum 1.40 (1.25-1.57)<br>MarketScan 1.37 (1.14-1.62)<br>Medicare 1.54 (1.39-1.80)<br>Exposure excluding eye drops:<br>Optum 1.01 (0.86-.19)<br>MarketScan 1.00 (0.77-1.26) |



| <b>Outcome</b>                         | <b>Authors</b> | <b>Year published</b> | <b>Design</b>       | <b>Comparator</b>                        | <b>Study population</b>                                   | <b>Country</b> | <b>Data source(s)</b> | <b>Association between fluoroquinolones and outcome</b> |
|--|----------------|-----------------------|---------------------|--|---|----------------|-----------------------|---|
|  |                |                       |                     |  |   |                |                       | Medicare 0.95 (0.82-1.08)                               |
| Hospital visit with retinal detachment | Muanda et al.  | 2022                  | Cohort study        | High dose (vs. low dose) fluoroquinolone | 11,917 adults aged ≥ 66 years with chronic kidney disease | Canada         | ICES data             | <u>Adjusted risk ratio (95% CI)</u><br>1.78 (0.77-4.09) |
| Retinal detachment                     | Taher et al.   | 2023                  | Nested case-control | Non-use                                  | 772 cases<br>3860 controls                                | USA            | Health Facts®         | <u>Adjusted odds ratio (95% CI)</u><br>0.75 (0.43-1.32) |

**Table 2.3 Non-interventional studies reporting the association between fluoroquinolones and aortic aneurysm or dissection**

| Outcome   | Authors              | Year published | Design                               | Comparator             | Study population                | Country | Data source(s)                              | Association between fluoroquinolones and outcome  |
|---|----------------------|----------------|--------------------------------------|------------------------|---------------------------------|---------|---|---|
| Aortic aneurysm or dissection (diagnosis)       | Daneman et al.       | 2015           | Cohort                               | Non-use                | 657,950 prescribed FQ           | Canada  | Ontario Registered Persons Database         | <u>Adjusted hazard ratio (95% CI):</u><br>2.72 (2.53-2.93)  |
| Aortic aneurysm or dissection (hospitalisation) | Lee et al.           | 2015           | Nested case-control                  | Non-use                | 1477 cases<br>147700 controls   | Taiwan  | National Health Insurance Research Database | <u>Adjusted rate ratios (95% CI)</u><br>Current use 2.43 (1.93-3.22)<br>Past use 1.48 (1.18-1.86)                         |
| Aortic aneurysm or dissection (hospitalisation) | Lee et al.           | 2018           | Case-crossover/<br>case-time-control | Non-use                | 1,213 cases                     | Taiwan  | National Health Research Insurance Database | <u>Adjusted odds ratios (95% CI)</u><br>Case-crossover 2.05 (1.13-3.71)<br>Case-time-control 2.47 (2.26-2.69)             |
| Aortic aneurysm or dissection (hospitalisation) | Pasternak et al.     | 2018           | Cohort study                         | Amoxicillin            | 360,088 matched pairs           | Sweden  | Swedish registers                           | <u>Adjusted hazard ratio (95% CI)</u><br>1.66 (1.12-2.46)   |
| Aortic aneurysm or dissection (hospitalisation) | Hsieh et al.         | 2019           | Nested case-control                  | Non-use                | 1,525 cases<br>147,700 controls | Taiwan  | National Health Insurance Research Database | <u>Adjusted odds ratio (95% CI):</u><br>2.47 (1.00-6.06)  |
| Aortic aneurysm (definition not clear)          | Kuranz et al.        | 2019           | New-user cohort                      | Penicillin             | >30,000 matched pairs           | USA     | Unspecified EMR network                     | <u>Adjusted risk or rate ratio - not clear (95% CI):</u><br>vs. amoxicillin 1.2 (0.8-1.9)<br>vs. penicillin 0.8 (0.5-1.2) |
| Ruptured aneurysm or dissection                 | Maumus-Robert et al. | 2019           | Case-time control                    | Non-use<br>Amoxicillin | 5,946 cases                     | France  | SNIIRAM                                     | <u>Adjusted odds ratios (95% CI)</u><br>vs. non-use 3.23 (1.85-5.63)  |

| Outcome   | Authors              | Year published | Design                      | Comparator   | Study population  | Country | Data source(s)                                     | Association between fluoroquinolones and outcome  |
|---|----------------------|----------------|-----------------------------|--|---|---------|--|---|
|   |                      |                |                             |  |   |         |  | vs. amoxicillin 2.44 (1.31-4.57)  |
| Aortic aneurysm or dissection (hospitalisation) | Sylvain et al.       | 2019           | New-user cohort             | Amoxicillin/amoxicillin clavulanate<br>Azithromycin  | 795,709 matched vs. amoxicillin<br>551,269 matched vs. azithromycin   | USA     | Veteran Affairs                                    | <u>Adjusted hazard ratios (95% CI)</u><br>vs. amoxicillin 1.74 (1.27-2.40)<br>vs. azithromycin 2.17 (1.41-3.34)   |
| Aortic aneurysm or dissection (hospitalisation) | Aspinall et al.      | 2020           | Self-controlled case series | Amoxicillin,<br>azithromycin<br>cefuroxime/<br>cephalexin,<br>doxycycline,<br>trimethoprim<br>sulfamethoxazole | 2,027 cases   | USA     | Veterans Health Administration databases           | <u>Adjusted rate ratio (95% CI):</u><br>vs. amoxicillin 1.50 (1.01-2.25)<br>vs. azithromycin 2.15 (1.27-3.64)<br>vs. cefuroxime/cephalexin 1.35 (0.81-2.24)<br>vs. doxycycline 1.81 (1.00-3.25)<br>vs. SMX-TMP 0.80 (0.53-1.25) |
| Aortic aneurysm or dissection (hospitalisation) | Dong et al.          | 2020           | Nested case-control         | Co-amoxiclav or combined ampicillin-sulfactam, extended-spectrum cephalosporins                                | 28,948 cases<br>289,480 matched controls  | Taiwan  | Taiwan National Health Insurance Research Database | <u>Adjusted odds ratio (95% CI):</u><br>vs. co-amoxiclav or combined ampicillin-sulfactam 1.01 (0.82-1.24)<br>vs. extended-spectrum cephalosporins 0.88 (0.70-1.11)   |
| Aortic aneurysm or dissection (hospitalisation) | Gopalkrishnan et al. | 2020           | Cohort                      | Azithromycin,<br>combined trimethoprim and sulfamethoxazole  | 279,554 patients with pneumonia prescribed FQ or azithromycin<br>948,364 patients with UTI prescribed FQ or | USA     | IBM MarketScan                                     | <u>Adjusted hazard ratios (95% CIs):</u><br>vs. azithromycin 2.57 (1.36-4.86)<br>vs. combined trimethoprim and sulfamethoxazole 0.99 (0.62-1.57)  |

| Outcome   | Authors           | Year published | Design                      | Comparator  | Study population                                  | Country     | Data source(s)   | Association between fluoroquinolones and outcome  |
|---|-------------------|----------------|-----------------------------|---|---|-------------|--|---|
|   |                   |                |                             |   | combined trimethoprim+ sulfamethoxazole           |             |  |   |
| Rupture aortic aneurysm                         | Kristensen et al. | 2021           | Case-crossover              | Non-use   | 58 cases with FQ exposure                         | Denmark     | Danish National Patient Register, Danish National Prescription Register, Danish Civil Registration System, Danish National Register of Causes of Death | <u>Adjusted odds ratio (95% CI)</u><br>Within 30 days 1.36 (1.00-1.86)<br>Within 60 days 2.16 (1.70-2.76)<br>Within 90 days 2.21 (1.78-2.75)                                |
| Aortic aneurysm or dissection (hospitalisation) | Londhe et al.     | 2021           | Self-controlled case series | Non-use   | 51,898 cases                                      | USA         | Optum Data Mart, IBM MarketScan, IBM Medicare  | <u>Adjusted rate ratios (95% CI)</u><br>OPTUM 1.24 (1.16-1.33)<br>IBMMDCR 1.13 (1.04-1.21)<br>IBMCOM 1.63 (1.45-1.84)   |
| Aortic aneurysm or dissection (diagnosis)       | Newton et al.     | 2021           | Cohort                      | Comparator antibiotic (co-amoxiclav, azithromycin, cephalexin, clindamycin, sulfamethoxazole) | 27,827,254 prescribed FQ or comparator antibiotic | USA         | IBM MarketScan   | <u>Adjusted hazard ratios (95% CI)</u><br>1.31 (1.25-1.37) abdominal aortic aneurysm<br>1.60 (1.33-1.91) iliac artery aneurysm<br>1.58 (1.39-1.79) other abdominal aneurysm |
| Aortic aneurysm or dissection (diagnosis)       | Son et al.        | 2022           | Nested case-control         | Non-use   | 29,638 cases<br>118,552 matched controls          | South Korea | National Health Insurance database   | <u>Adjusted odds ratio (95% CI)</u><br>1.10 (1.07-1.14)   |
| Aortic aneurysm or dissection (diagnosis)       | Chen et al.       | 2022           | Cohort                      | 1 <sup>st</sup> or 2 <sup>nd</sup> generation cephalosporins                                  | 28,568 propensity score matched pairs             | Taiwan      | National Health Research Insurance Database  | <u>Adjusted hazard ratio (95% CI):</u><br>0.86 (0.59-1.27)  |

| <b>Outcome</b>                                  | <b>Authors</b> | <b>Year published</b> | <b>Design</b>  | <b>Comparator</b> | <b>Study population</b> | <b>Country</b> | <b>Data source(s)</b>                       | <b>Association between fluoroquinolones and outcome</b> |
|---|----------------|-----------------------|----------------|-------------------|-------------------------|----------------|---|---|
| Aortic aneurysm or dissection (hospitalisation) | Chen et al.    | 2023                  | Case-crossover | Non-use           | 550 cases               | Taiwan         | National Health Research Insurance Database | <u>Odds ratio (95 % CI):</u><br>1.00 (0.32-3.10)        |

**Table 2.4 Non-interventional studies reporting the association between fluoroquinolones and peripheral neuropathy**

| Outcome               | Authors        | Year published | Design              | Comparator  | Study population                                | Country | Data source(s)                          | Association between fluoroquinolones and outcome   |
|-----------------------|----------------|----------------|---------------------|---|---|---------|---|--|
| Peripheral neuropathy | Etminan et al. | 2014           | Nested case-control | Non-use   | 6,226 cases<br>24,904 controls                  | USA     | LifeLink database                       | <u>Adjusted rate ratios (95% CI)</u><br>Current use 1.83 (1.49-2.27)<br>Current new use 2.07 (1.56-2.74) |
| Peripheral neuropathy | Morales et al. | 2019           | Nested case-control | Non-use   | 5,327 cases<br>17,285 controls                  | UK      | The Health Improvement Network database | <u>Adjusted rate ratio (95% CI)</u><br>1.47 (95% CI 1.13-1.92)   |
| Peripheral neuropathy | Karol et al.   | 2020           | Cohort              | Non-use   | 598 children with acute lymphoblastic leukaemia | USA     | Prospective                             | <u>Adjusted hazard ratio (95% CI)</u><br>0.8 (0.5-1.04)  |
| Peripheral neuropathy | Ellis et al.   | 2021           | Cohort              | Comparator antibiotic (azithromycin, amoxicillin, co-amoxiclav, cefixime) | 976,568 matched pairs                           | USA     | Optum Clinformatics Data Mart           | <u>Adjusted hazard ratio</u><br>1.09 (1.07-1.11)   |

## 2.8 Figures

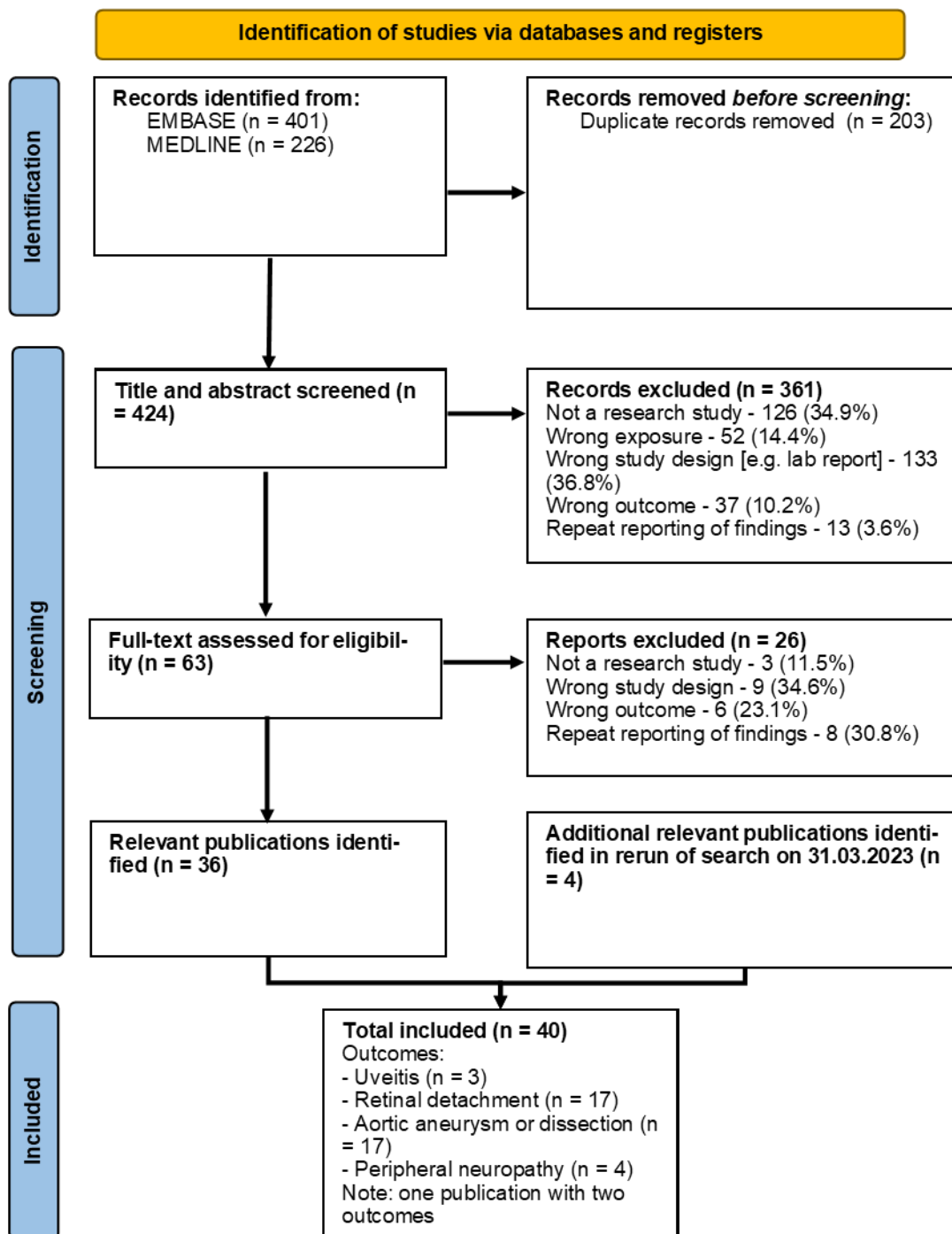


Figure 2.1 Flow chart of inclusions in literature review

## CHAPTER 3. DATA SOURCES AND METHODS TO HANDLE UNMEASURED CONFOUNDING

### Overview

In this chapter I describe the data sources I used to conduct non-interventional studies estimating associations between PPI prescribing and mortality, and between fluoroquinolone prescribing and uveitis, retinal detachment, aortic aneurysm or aortic dissection, and peripheral neuropathy. I briefly introduce each of the conducted non-interventional studies, with detailed methodology provided in subsequent research papers, and I outline the methods used in each study to handle unmeasured confounding.

I initially review the data sources used in these studies: Clinical Practice Research Datalink (CPRD) GOLD, CPRD Aurum, Hospital Episodes Statistics Admitted Patient Care (HES APC), Office for National Statistics (ONS) mortality data, and small area-level data. GOLD and Aurum are databases of UK primary care records, which in my studies are linked to additional datasets of hospital records for admitted patients, death registration data, and small area-level socioeconomic deprivation measures.

I then introduce non-interventional studies I conducted examining the association between prescribing of proton pump inhibitors (PPI) and mortality, and between fluoroquinolone prescribing and the chosen outcomes. I outline the methods I use in these studies to reduce, diagnose, and quantify bias due to unmeasured confounding.



## **3.1 Data sources**

### **3.1.1 Clinical Practice Research Datalink (CPRD) GOLD**

CPRD GOLD is a UK electronic primary care record database.<sup>1</sup> It contains anonymised routinely collected patient records from participating general practices using Vision® software in England, Wales, Scotland and Northern Ireland.<sup>1</sup> As of the October 2021 data release, it contains data on 20,602,148 individuals with data deemed of research quality.<sup>2</sup> Of these individuals 3,134,155 were, as of October 2021, alive and registered at a practice contributing data.<sup>2</sup> This represents approximately 5% of the UK population.<sup>2</sup>

The dataset is composed of separate files:

- *Patient* contains basic information on the patient such as year of birth, gender and date of registration at practice.<sup>3</sup>
- *Practice* contains data on the practice itself (e.g., region).
- *Staff* contains information on practice staff (e.g., staff role).
- *Consultation* includes data on the type of each recorded consultation.
- *Clinical* and *Referral* have information on clinical and referral events, such as diagnoses and referrals to secondary care for a specific condition, which are coded using Read v2 codes.<sup>7</sup>
- *Therapy* and *Immunisation* include data on therapeutic products, such as drugs, and on vaccinations.
- *Test* includes data on tests performed in primary care, such as blood pressure measurements.
- *Additional* holds additional clinical data such as height, blood group, and body weight.

Information recorded in free text by the general practitioner is not generally available to researchers.<sup>1</sup>

As a database, GOLD has been widely used for epidemiological research and has been validated for many medical conditions.<sup>4-7</sup> It has been found to be generally representative of the UK population in terms of age, sex, and ethnicity.<sup>1</sup>

### **3.1.2 Clinical Practice Research Datalink (CPRD) Aurum**

CPRD Aurum is a separate UK electronic primary care record database to CPRD GOLD. Aurum contains data from practices using EMIS Web® electronic patient record system software, rather than practices using Vision® software as in CPRD GOLD.<sup>8</sup> As of June 2021, it contains data on 40,000,297 individuals with data deemed of research quality.<sup>9</sup> Contributing practices are almost exclusively located in England with only a few contributing practices outside England, in Wales.<sup>9</sup> Of the individuals with data of research quality 13,375,774 were currently registered as of June 2021, accounting for 20.0% of the UK population.<sup>9</sup>

The data files in CPRD Aurum consist of<sup>8</sup>:

- *Patient* contains basic patient information (e.g., year of birth).
- *Practice* holds general practice details (e.g., region).
- *Staff* includes practice staff information (e.g., role).
- *Consultation* contains consultation details (e.g., type of consultation).
- *Drug Issue* holds data on prescriptions.
- Clinical information is recorded differently in Aurum compared to GOLD, with clinical events recorded in the *Observation* file using a mixture of Read v2, SNOMED CT and EMIS Web® codes.<sup>7, 8, 10</sup>
- Additional data linked to the *Observation* file is recorded in the *Problem* and *Referral* files.
- *Referral* holds information on referrals, such as referrals to secondary care.
- *Problem* contains additional details on medical issues, which may be long-standing, and have been deemed a problem by the GP (general practitioner).

As with GOLD, Aurum does not contain the free text notes made by GPs.<sup>8</sup>

A number of clinical conditions have been validated in CPRD Aurum.<sup>11-13</sup> Furthermore, CPRD Aurum has been found to be broadly representative of the English population in terms of age, sex and socioeconomic deprivation.<sup>9</sup>

### **3.1.3 Hospital Episode Statistics Admitted Patient Care (HES APC)**

HES APC is a database of all NHS hospital admissions in England.<sup>14</sup> Hospital admission is defined as a hospital activity that requires a hospital bed, which includes day cases,

emergency or planned admissions, births and deliveries, but excludes outpatient and emergency department visits.<sup>14</sup> CPRD provide HES APC data for patients registered at practices which have opted in to HES linkage.<sup>1,8</sup> A higher proportion of Aurum than GOLD patients can be linked to HES APC, due to the high proportion of Aurum practices in England relative to Wales, Scotland and Northern Ireland.

HES APC data is structured into spells and episodes. A spell represents a continuous inpatient stay at one hospital, while an episode is a component of a spell and represents an uninterrupted period of care with one consultant at a hospital.<sup>14</sup> Within each episode diagnoses are recorded using ICD-10 codes (International Classification of Diseases version 10) and procedures using OPCS codes (Office of Population Censuses and Surveys Classification of Interventions and Procedures).<sup>14, 15</sup> While data is contained on diagnoses and procedures, information on hospital prescribing is not available in HES APC.<sup>14</sup> Many research studies have been conducted using HES APC data, which has led to over 300 scientific publications.<sup>14</sup>

#### **3.1.4 Office for National Statistics (ONS) Mortality Data**

In England and Wales it is a legal requirement for all deaths to be registered in a timely manner.<sup>16</sup> Death registration is enacted through a Local Registration Service with information on the deceased collected from an informant (typically nearest kin) and a Medical Certificate of Cause of Death completed by a medical practitioner.<sup>16</sup> Cause of death is coded with ICD-9 (International Classification of Diseases version 9) or, since 2001, using ICD-10. In ONS mortality data linked to CPRD, date of death, underlying cause of death, and other causes of death are available.<sup>16</sup>

#### **3.1.5 Small area-level data**

Measures of socioeconomic deprivation are available linked to both GOLD and Aurum. These measures are available based on the patient's postcode or based on the postcode of their primary care practice.<sup>17, 18</sup> In the studies reported in this thesis two measures of area-level deprivation were used: Index of Multiple Deprivation (IMD) and Carstairs Index. IMD is based on different aspects of deprivation including employment, income, education and skills, housing, health, crime, access to services and living environment.<sup>19, 20</sup> Carstairs Index is a narrower measure of material deprivation based upon male unemployment, car ownership, overcrowding, and socioeconomic class.<sup>21</sup> While IMD indices are not directly

comparable between nations within the UK due to differences in calculation, Carstairs Index scores are comparable.<sup>17</sup>

## **3.2 Proton pump inhibitors and risk of death**

As discussed in the background chapter (Chapter 1) PPI safety is an area where residual unmeasured confounding is expected to be a potential problem. PPIs are a more recently licenced and more effective medication than H2 receptor antagonists (H2RAs) or antacids, and as such may be prescribed to patients who are frailer or who differ in other ways from those prescribed an H2RA. The underlying frailty and health status of individuals is not captured well in electronic health records, leading to potential residual confounding due to poorly measured or unmeasured confounders in non-interventional studies investigating this safety topic.

### **3.2.1 Study design**

I conducted in CPRD GOLD a cohort study to compare mortality overall and by cause among new users of PPIs, relative to both new users of H2 receptor antagonists (H2RAs) and to non-users of PPI or H2RA acid suppression therapy matched to PPI users on age, sex and calendar year. H2RAs are an acid-suppression medication used for similar indications to PPIs. It is not clear, however, that H2RAs users are sufficiently similar to eliminate confounding, even with adjustment for measured covariates. I estimated hazard ratios between PPI prescribing and mortality using Cox regression, with propensity score weighting to adjust for measured covariates.

In this study, exposure was ascertained using primary care prescribing data in GOLD. To ascertain outcomes, I used linked ONS mortality data. In order to define covariates, I used linked HES APC and socioeconomic deprivation data, in addition to the GOLD primary care records.

### **3.2.2 Approaches for handling unmeasured confounding**

I applied five different approaches in this study to diagnose and quantify residual confounding due to unmeasured or poorly measured confounders.

To diagnose potential bias due to residual confounding I used:

- 1) **A secondary comparator group of non-users of PPI/H2RA acid-suppression therapy.**<sup>22</sup> I reasoned that if chosen covariates were sufficient to control all

confounding and, as anticipated, there was no causal effect of H2RAs, then results using both comparators would be similar.<sup>22</sup> If effects differed considerably this could indicate residual confounding in at least one of the comparisons. Additionally, differing estimates would indicate that measured covariates may not be sufficient to control all confounding.

- 2) **Multiple risk windows.** In the primary analysis I included all follow-up when calculating effect estimates. In a secondary analysis I estimated short-term mortality over 6 months from specific causes which typically develop over a span of years (e.g., dementia and Alzheimer's). A short-term causal effect would seem unlikely for these outcomes. If a short-term association was identified, this may indicate residual confounding.
- 3) **Mortality from pulmonary embolism as a negative control outcome.** Pulmonary embolism may be similarly associated with the unmeasured and poorly measured confounders thought to affect the association with overall mortality (i.e., underlying health status and frailty). However, pulmonary embolism has not been suggested as an adverse outcome of PPI usage. If a positive association is observed this may indicate bias due to confounding.<sup>23</sup>
- 4) **Covariate adjustment using a high-dimensional propensity score.** In the primary analysis I adjusted for covariates by weighting using a propensity score based on investigator-specified covariates. In a secondary analysis I calculated a high-dimensional propensity score, which incorporates many more covariates in a data-driven manner.<sup>24</sup> If when weighting with the high dimensional propensity score, effect estimates are closer to the null, this may indicate that the investigator-specified measured covariates are not sufficient to control all confounding.
- 5) Finally, to quantify the potential impact of an unmeasured confounder on results I calculated **E-values**.<sup>25</sup> These are a quantitative measure that indicate how strongly associated an unmeasured confounder would need to be with the exposure and outcome to fully explain observed results.

### **3.3 Fluoroquinolones and risk of uveitis, retinal detachment, AA/AD and peripheral neuropathy**

Fluoroquinolone safety is, as outlined in Chapters 1 and 2, another area where unmeasured confounding could be a problem. Fluoroquinolones are prescribed for a wide range of infections, and there may be confounding of associations by the infection itself or by the underlying health state of patients prone to infection. Infection type and severity is poorly recorded in electronic health records, and as such may lead to residual confounding.

#### **3.3.1 Study design**

I conducted cohort studies in GOLD and Aurum to estimate associations between prescribing of fluoroquinolones and the studied outcomes: uveitis, retinal detachment, hospitalisation with AA/AD, and peripheral neuropathy. I compared incidence of these outcomes among individuals prescribed fluoroquinolones to those prescribed cephalosporins, a comparator class of antibiotic used for similar indications. I estimated hazard ratios between fluoroquinolone prescribing and the studied outcomes using Cox regression, with propensity score weighting to adjust for measured covariates.

For all outcomes except peripheral neuropathy, I also conducted self-controlled studies in GOLD and Aurum to estimate associations between fluoroquinolone prescribing and each of these outcomes. Because of the case-based nature of self-controlled studies it is easy to incorporate multiple exposures, and I therefore compared risk with fluoroquinolone prescribing to multiple other comparator antibiotics: cephalosporins, trimethoprim, and co-amoxiclav. As peripheral neuropathy does not necessarily present acutely, I did not consider it an appropriate topic for a self-controlled study, which typically relies upon an assumption of acute presentation.<sup>26</sup> While aortic aneurysm does not necessarily present acutely, hospitalisation with aortic aneurysm is an acute outcome, and is therefore suitable for a self-controlled study.

For uveitis and retinal detachment, the self-controlled study design that I applied was the self-controlled case series. For hospitalisation with aortic aneurysm, I conducted a case-crossover study. Ruptured aortic aneurysm and aortic dissection can frequently be fatal, and therefore do not meet the assumption of a self-controlled case series that the outcome does not have a long-term effect on prescribing. Conditional Poisson regression, adjusted for calendar year

and age, was used in the self-controlled case series studies to estimate rate ratios. Conditional logistic regression was used in the case-crossover study to estimate odds ratios.

In these cohort and self-controlled studies, exposure was ascertained using primary care prescribing data in GOLD and Aurum. To ascertain outcomes, I used linked HES APC data in addition to primary care records. In order to define covariates, in addition to primary care records I used linked HES APC and socioeconomic deprivation data.

### **3.3.2 Approaches for handling unmeasured confounding**

I adopted three approaches in this study to reduce and quantify potential residual confounding due to unmeasured or poorly measured confounders.

These approaches were:

- 1) **Self-controlled study designs** which inherently eliminate confounding by measured and unmeasured time-invariant confounders.<sup>27</sup> In self-controlled studies, we look at associations between the timing of exposure and outcome within individuals. Given that the comparison is within each included individual, variables that are time-invariant over follow-up (e.g., genetic traits) will not impact self-controlled study effect estimates.
- 2) **Active comparators in self-controlled studies.** Active comparators should reduce the likelihood of residual time-varying confounding if the patients prescribed drug of interest and active comparator are sufficiently similar.<sup>28</sup> I included multiple active comparators in the self-controlled studies. Individuals prescribed any one comparator may not be sufficiently similar to fluoroquinolone users to reduce confounding, or may have elevated outcome incidence by chance. Including multiple comparators should give us increased confidence in findings.
- 3) **Quantitative bias analysis using E-values and Cornfield conditions** to quantify the robustness of findings to potential unmeasured confounding.<sup>25</sup> E-values and Cornfield conditions quantify how strongly associated an unmeasured confounder would need to be with both exposure and outcome to explain the observed association (i.e. so that if the confounder could be adjusted for, the association would be null).

## **3.4 Summary**

CPRD GOLD and Aurum are two large primary care record databases. These datasets are rich sources of healthcare data and can facilitate large epidemiological studies of important

health questions. However, as with other databases not all determinants of prescribing and disease are recorded leading to potential unmeasured confounding. Increasing dataset size reduces random error but systematic error remains, including that due to residual confounding. PPI and fluoroquinolone safety are two areas where unmeasured confounding is a particular concern. Unmeasured confounding may have affected previous studies into these topics and could impact the studies I conducted. Therefore, I used methods to diagnose, reduce, and quantify potential unmeasured confounding. These methods, as set out in this chapter, included negative controls to diagnose, self-controlled designs to reduce, and quantitative bias analysis to quantify potential unmeasured confounding.



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# **CHAPTER 4. RESEARCH PAPER: QUANTIFYING POSSIBLE BIAS IN CLINICAL AND EPIDEMIOLOGICAL STUDIES WITH QUANTITATIVE BIAS ANALYSIS: POTENTIAL APPROACHES AND LIMITATIONS**

## **Overview**

In this chapter I present a submitted research paper I wrote on quantitative bias analysis. In this paper I outline methods to quantify potential residual bias in epidemiological studies due to unmeasured confounding, misclassification, and selection bias. I discuss the value of these methods, pitfalls in application, and limitations.

In later chapters I apply some of these methods presented here, namely E-values and Cornfield conditions, in non-interventional studies to quantify the potential for bias due to unmeasured confounding in study results.

## RESEARCH PAPER COVER SHEET

Please note that a cover sheet must be completed for each research paper included within a thesis.

### SECTION A – Student Details

|                     |   |       |     |
|---------------------|---|-------|-----|
| Student ID Number   | 368990  | Title | Mr. |
| First Name(s)       | Jeremy Philip   |       |     |
| Surname/Family Name | Brown   |       |     |
| Thesis Title        | Application of methods for handling unmeasured confounding in pharmacoepidemiological studies |       |     |
| Primary Supervisor  | Professor Ian Douglas   |       |     |

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

### SECTION B – Paper already published

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|---|---|
| Where is the work intended to be published?                       | BMJ or International Journal of Epidemiology  |
| Please list the paper's authors in the intended authorship order: | Jeremy P Brown, Jacob N Hunnicutt, M Sanni Ali, Krishnan Bhaskaran, Dina Christensen, Ashley Cole, Daniel Dedman, Sinead M Langan, Dorothea Nitsch, Christopher T Rentsch, Nicholas W Galwey, Kevin Wing, Ian J Douglas |
| Stage of publication  | Submitted   |

**SECTION D – Multi-authored work**

|   |   |
|---|---|
| <p>For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)</p> | <p>I conceptualised the paper, did the research to inform the paper, and wrote all drafts of the paper. Other authors provided input through discussion, which I incorporated into the paper, and all authors reviewed all drafts of the paper.</p> |
|---|---|

## **Quantifying possible bias in clinical and epidemiological studies with quantitative bias analysis: potential approaches and limitations**

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### **4.1 Abstract**

Bias in epidemiological studies can affect the validity of study findings. Sensitivity analyses, termed quantitative bias analyses, are available to quantify potential residual bias from measurement bias, confounding, and selection bias. Effective application of these methods benefits from the input of multiple parties including clinicians, epidemiologists, and statisticians. In this article, we provide an overview of available methods to facilitate both the use of these methods and critical interpretation of applications in the published literature. Quantitative bias analysis methods are described and illustrated using examples. Considerations to be made when choosing between methods are outlined and limitations of quantitative bias analysis are discussed.

### **4.2 Key points**

- Quantitative bias analysis methods allow investigators to quantify potential residual bias and to objectively assess the sensitivity of study findings to this potential bias.
- Bias formulas, bounding methods, and probabilistic bias analysis can be used to assess sensitivity of results to potential residual bias with each method having distinct strengths and limitations.
- Quantitative bias analysis relies on assumptions about bias parameters (e.g., the strength of association between unmeasured confounder and outcome) which can be informed by sub-studies, secondary studies, literature or expert opinion.

- When applying, interpreting, and reporting quantitative bias analysis it is important to transparently report assumptions, to consider multiple biases if relevant, and to account for random error.

Bias in epidemiological studies is a major concern. Biased studies have the potential to mislead, and as a result to negatively impact on clinical practice and public health. The potential for residual systematic error due to measurement bias, confounding, or selection bias is often acknowledged in publications but is seldom quantified.<sup>1</sup> Therefore, for many studies it is difficult to judge the extent to which residual bias could impact study findings, and how confident we should be about their conclusions. Increasingly large datasets with millions of patients are available for research, such as insurance claims data. With increasing dataset size, random error decreases but bias remains, potentially leading to incorrect conclusions.

Sensitivity analyses to quantify potential residual bias are available.<sup>2-6</sup> However, usage of these methods is limited. Effective use typically requires input from multiple parties including clinicians, epidemiologists, and statisticians, to bring together clinical and domain-area knowledge, epidemiological expertise, and a statistical understanding of the methods. Improved awareness of these methods and their pitfalls will enable more frequent and effective implementation, as well as critical interpretation of their application in the medical literature.

In this article we briefly review bias in epidemiological studies due to measurement bias, confounding, and selection bias. We then introduce quantitative bias analyses as methods to quantify the potential impact of residual bias (i.e., bias that has not been taken into account through study design or statistical analysis). Finally, we discuss limitations and pitfalls in the application and interpretation of these methods.

### **4.3 Types of bias**

All clinical studies, both interventional and non-interventional, are potentially vulnerable to bias. Bias is ideally prevented or minimised through careful study design and the choice of appropriate statistical methods. In non-interventional studies three major biases that can impact findings are measurement bias (also known as information bias) due to measurement error (referred to as misclassification for categorical variables), confounding and selection bias.



Misclassification occurs when one or more categorical variables (such as the exposure, outcome, and/or covariates) are mismeasured or misreported. Continuous variables may also be mismeasured leading to measurement error. As one example, misclassification occurs in some studies of alcohol consumption due to misreporting by study participants of their alcohol intake.<sup>7,8</sup> As another example, in studies using electronic health records or insurance claims data there may be outcome misclassification if the outcome is not always reported to or recorded by the individual's health care professional.<sup>9</sup> Misclassification can lead to biased study findings in both descriptive and aetiological (i.e. cause-effect) non-interventional studies.<sup>10</sup>

Confounding arises in aetiological studies when the association between exposure and outcome is not solely due to the causal effect of the exposure, but rather is partly or wholly due to one or more other causes of the outcome associated with the exposure. For example, it has been found that greater adherence to statins is associated with a reduction in motor vehicle accidents and an increase in the use of screening services. However, this is almost certainly not due to a causal effect of statins on these outcomes, but more probably because attitudes to precaution and risk that are associated with these outcomes are also associated with adherence to statins.<sup>11</sup>

Selection bias occurs when non-random selection of people or person-time into the study results in systematic differences between results obtained in the study population and results that would have been obtained in the population of interest.<sup>12,13</sup> This bias can arise due to selection at study entry or due to differential loss to follow-up. For example, in a cohort study where the patients selected are those admitted to hospital in respiratory distress, COVID-19 and COPD may be negatively associated, even if there is no association in the overall population, because if you do not have one condition it is more likely you have the other in order to be admitted.<sup>14</sup> Selection bias can affect both descriptive and etiological non-interventional studies.

#### **4.4 Handling bias in practice**

All three biases should ideally be minimised through study design and analysis. For example, misclassification can be reduced by the use of a more accurate measure, confounding through measurement of all relevant potential confounders and their subsequent adjustment, and

selection bias through appropriate sampling from the population of interest in the absence of differential loss to follow-up.

Even with the best available study design and most appropriate statistical analysis, we typically cannot guarantee residual bias will be absent. For instance, it is often not possible to perfectly measure all required variables, or it may be impossible/impractical to collect or obtain data on every possible potential confounder. It may also not be practically feasible to sample randomly from the population of interest.

To ignore potential residual biases can lead to misleading results and erroneous conclusions. Often the potential for residual bias is acknowledged qualitatively in the discussion, but these qualitative arguments are typically subjective and often downplay the impact of any bias. Quantitative bias analysis allows both authors and readers to assess robustness of study findings to potential residual bias rigorously and quantitatively.

#### **4.5 Methods to quantify potential bias**

When designing or appraising a study there are a number of key questions related to bias that need to be considered (box 1).<sup>15</sup> If, on the basis of the answers to these questions, there is potential for residual bias(es), then quantitative bias analysis methods can be considered to estimate the robustness of findings.

##### **Box 1: Key bias-related questions when designing and appraising a non-interventional study**

- Misclassification and measurement error: Are the exposure, outcome, and covariates likely to be measured and recorded accurately?
- Confounding: Are there potential causes of the outcome, or proxies for these causes, which may differ in prevalence between exposure groups? Are these potential confounders measured and controlled through study design or analysis?
- Selection bias: What is the target population? Are individuals in the study representative of this target population?

There are a large number of quantitative bias analysis methods, though only a few of these are regularly applied in practice. In this article we will introduce three of the most commonly applied methods<sup>1</sup>: bias formulas, bounding methods, and probabilistic bias analysis.

#### **4.6 Bias formulas**

We can use simple mathematical formulas to estimate the bias in a study and to estimate what the results would be in the absence of that bias.<sup>4</sup> Commonly applied formulas, along with details of available software to implement methods listed, are provided in the appendices. Some of these methods can be applied to the summary results (e.g., risk ratio), whereas other methods require access to the full study data.

These formulas require us to specify additional information about the confounding, misclassification, or selection bias that typically cannot be obtained from the study data itself.

Bias formulas for unmeasured confounding generally require us to specify<sup>4, 16</sup>:

- (1) the prevalence of the unmeasured confounder in the unexposed individuals
- (2) the prevalence of the unmeasured confounder in the exposed individuals (or alternatively the association between exposure and unmeasured confounder)
- (3) the association between unmeasured confounder and outcome.

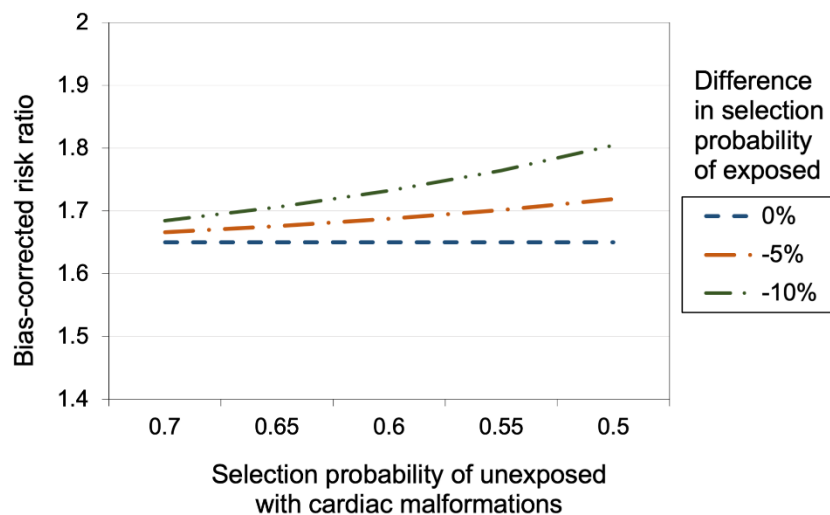
These bias formulas can be applied to the summary results (e.g., risk ratios, odds ratios, risk differences, hazard ratios etc.) and to 2x2 tables, and they produce “corrected” results assuming the specified bias parameters. Generally, the exact bias parameters are unknown so a range of parameters will be entered into the formula, producing a range of possible “bias-corrected” results under more or less extreme confounding scenarios.

Bias formulas for misclassification work in a similar way, but typically require us to specify positive predictive value and negative predictive value, or sensitivity and specificity, of the misclassified variable, stratified by exposure and/or outcome. These formulas typically require study data in the form of 2x2 tables.<sup>17, 18</sup>

Bias formulas for selection bias are applicable to the odds ratio or to 2x2 tables, and normally require us to specify probabilities of selection into the study for different levels of exposure and outcome.<sup>19</sup> An example of the application of bias formulas for selection bias is given in Box 2.

### Box 2: An application of bias formulas for selection bias

In a cohort study of pregnant women investigating the association between lithium use, relative to non-use, and cardiac malformations in live-born infants, the observed adjusted risk ratio was 1.65 (95% CI, 1.02-2.68).<sup>20</sup> Only live-born infants were selected into the study, and therefore there was potential for selection bias if there were differences in the termination probabilities of foetuses with cardiac malformations between exposure groups. A range of selection probabilities, stratified by exposure and outcome status, were specified, informed by the literature. Depending on assumed selection probabilities, the bias-corrected estimates of the risk ratio ranged from 1.65 to 1.80 (Figure 4.1), indicating that the estimate was robust to this selection bias under given assumptions.



**Figure 4.1 Bias-corrected risk ratio for different assumed selection probabilities**

\* Selection probability of unexposed without cardiac malformations was assumed to be 0.8 (i.e., 20% probability of termination). Selection probabilities in exposed were defined relative to unexposed by outcome status (i.e., -0%, -5%, and -10%).

It is possible to incorporate measured covariates in these formulas, but specification then generally becomes more difficult as we typically have to specify bias parameters, such as the prevalence of the unmeasured confounder, within strata of measured covariates.

Although we may not be able to estimate these unknowns from the main study itself, we can specify plausible ranges based on the published literature, clinical knowledge, or a secondary or sub-study. Secondary studies or sub-studies, in which additional information is collected from a subset of study participants or from a representative external group, are particularly valuable as they are more likely to accurately capture unknown values.<sup>21</sup> However, depending on the particular situation, they may be infeasible for a given study due to data access limitations and resource constraints. The published literature can be informative if there are relevant publications and the study populations in the published studies are sufficiently similar to the population under investigation. Subjective judgements of plausible values for unknowns are vulnerable to the viewpoint of the investigator, and as a result may not accurately reflect the true unknown values. The validity of quantitative bias analysis depends critically on the validity of the assumed values. When implementing quantitative bias analysis, or appraising quantitative bias analysis in a published study, it is important to question the choices made for these unknowns, and for study investigators to report these choices with transparency.

#### **4.7 Bounding methods**

Bounding methods are mathematical formulas, similar to bias formulas, that we can apply to study results for confounding, selection bias, and misclassification.<sup>5, 22, 23</sup> However, unlike bias formulas, they require only a subset of the unknown values to be specified. While this seems advantageous, one important disadvantage is that bounding methods generate a bound on the maximum possible bias, rather than an estimate of the true association adjusted for bias.

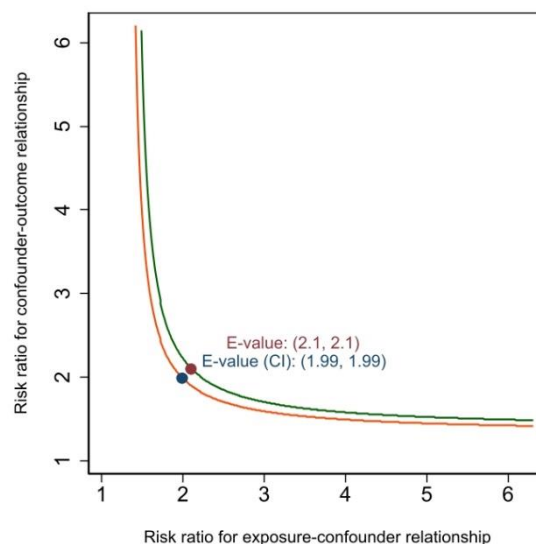
One very popular bounding method for unmeasured confounding is the E-value.<sup>5</sup> Using E-value formulas it is possible to calculate a bound on the bias-corrected estimate by specifying the association (e.g. risk ratio) between exposure and unmeasured confounder and between unmeasured confounder and outcome, while leaving the prevalence of the unmeasured confounder unspecified. The E-value itself is the minimum value that either the association between exposure and unmeasured confounder or between unmeasured confounder and outcome must exceed to potentially reduce the bias-adjusted findings to the null (or alternatively to some specified value). If the plausible strength of association between the unmeasured confounder and both exposure and outcome is smaller than the E-value then that one confounder could not fully explain the observed association, providing support to the

study findings. If the strength of association between the unmeasured confounder and either exposure or outcome is plausibly larger than the E-value, then we can only conclude that residual confounding *might* explain the observed association, but it is not possible to say whether such confounding is in truth sufficient, as we have not specified the prevalence of the unmeasured confounder. The use of bounding methods for unmeasured confounding is illustrated in Box 3.

### Box 3: An application of bounding-methods

In a cohort study investigating the association between proton pump inhibitors, relative to H2 receptor antagonists, and all-cause mortality, investigators found evidence that individuals prescribed proton pump inhibitors were at higher risk of death (adjusted hazard ratio [HR] 1.38, 95% CI 1.33-1.44).<sup>24</sup> However, unmeasured differences in frailty between users of H2 receptor antagonists and users of proton pump inhibitors may bias findings. Because the prevalence of the unmeasured confounder in the different exposure groups was unclear, the E-value was calculated.

The E-value for the point estimate of the adjusted HR, 1.38, was 2.10. Hence either the adjusted risk ratio between exposure and unmeasured confounder, or that between unmeasured confounder and outcome, must be greater than 2.10 to potentially explain the observed association of 1.38. We can plot a curve showing the values of these risk ratios necessary to potentially reduce the observed association to the null (Figure 4.2). The E-value can be applied to the bounds of the confidence interval to account for random error. The calculated E-value for the lower bound of the 95% confidence interval (i.e., adjusted HR = 1.33) was 1.99.



**Figure 4.2 E-value plot for unmeasured confounding of association between proton pump inhibitors and mortality**

Given risk ratios  $>2$  observed in the literature between frailty and mortality, unmeasured confounding could not be ruled out as a possible explanation for observed findings. However, given that we used a bounding method, and did not specify unmeasured confounder prevalence, we could not say with certainty whether such confounding was likely to explain the observed result.

#### **4.8 Probabilistic bias analysis**

Probabilistic bias analysis takes a different approach to handling uncertainty around the unknown values. Rather than specifying a single value or a range of values for an unknown, a probability distribution (e.g., a normal distribution) is specified for each of the unknown quantities. This represents the uncertainty about the unknown values, and values are sampled repeatedly (e.g., 10,000 times) from this distribution before applying bias formulas using the sampled values. These formulas can be applied to either summary or patient-level data. The result is a distribution of bias-adjusted estimates. An example of probabilistic bias analysis for misclassification is given in Box 4.

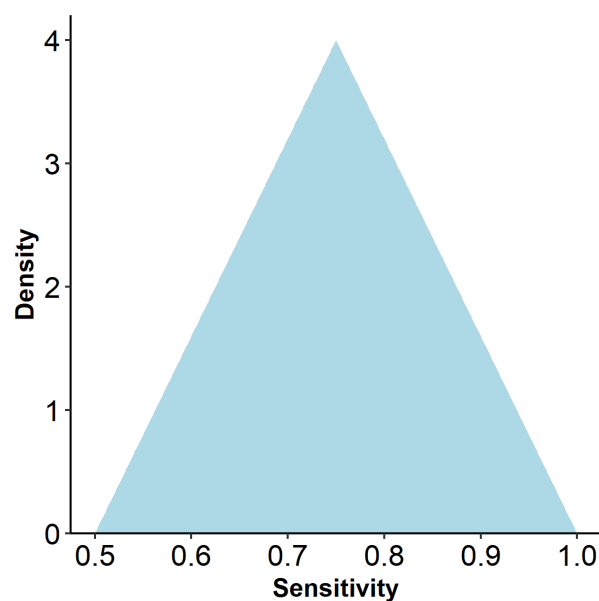
Probabilistic bias analysis can readily handle a large number of unknowns, which makes it particularly useful for handling multiple biases simultaneously.<sup>25</sup> However, it can be difficult to specify a realistic distribution if there is little information on the unknowns from published studies or from a validation study. An additional disadvantage is that it is typically not clear, from the results, what are the consequences of selecting specific values for unknowns, which can be informative. There are, however, other advantages. For one, probabilistic bias analysis can readily incorporate random error, unlike some bias formulas for misclassification. Secondly, when performing corrections at the patient record-level, analytical methods such as regression can be applied after correction to adjust associations for measured covariates.<sup>26</sup>



#### **Box 4: An application of probabilistic bias analysis**

In a cohort study of pregnant women, the observed adjusted risk ratio for the association between antidepressant use and congenital cardiac defects, among women with depression, was 1.02 (95% CI, 0.90-1.15).<sup>27</sup>

Some misclassification of the outcome, congenital cardiac malformations, was expected, and therefore probabilistic bias analysis was conducted. Based on data from an internal validation study, triangular distributions of plausible values for sensitivity (Figure 4.3) and specificity of outcome ascertainment were specified.



**Figure 4.3 Specified distribution of values for sensitivity of outcome ascertainment**

Values were sampled 1,000 times from these distributions and were used to calculate a distribution of bias-adjusted estimates. The median bias-adjusted estimate was 1.06, and the 95% simulation interval was 0.92-1.22. This finding indicates that under the given assumptions the results were robust to outcome misclassification, as the “bias-corrected” results were similar to the initial estimated results, with both suggesting no evidence of association between antidepressant use and congenital cardiac defects.

## **4.9 Pitfalls of methods**

### **4.9.1 Incorrect assumptions**

Study investigators and readers of published research should be aware that the outputs of quantitative bias analyses are only as good as the assumptions made. These include both assumptions about the values chosen for the bias parameters (see Table 4.1), and assumptions inherent to the methods. For example, applying the E-value directly to a hazard ratio rather than a risk ratio is an approximation, and only a good approximation when the outcome is rare.<sup>28</sup>

Simplifying assumptions are required by many quantitative bias analysis methods. For example, it is often assumed that the exposure does not modify the unmeasured confounder-outcome association.<sup>4</sup> If these assumptions are not met then the findings of quantitative bias analysis may be inaccurate.

Ideally, assumptions would be based on validation studies conducted in a subset of the study population (i.e., internal validation studies), but this is not always feasible.

### **4.9.2 Multiple biases**

It is a mistake to assume that if the results are robust to one source of bias, they must necessarily reflect the causal effect. Depending on the particular study there may be multiple residual biases, such as multiple unmeasured confounders, and jointly quantifying the impact of all of these is necessary to properly assess robustness of results.<sup>22</sup> Bias formulas and probabilistic bias analyses can be applied for multiple biases, but specification is more complicated. Bounding methods are available for multiple biases.<sup>22</sup>

### **4.9.3 Prespecification**

Prespecification of quantitative bias analysis in the study protocol is valuable so that choice of unknown values and choice to report bias analysis is not influenced by whether the results of bias analysis are in line with the investigators expectations. Clearly a very large range of analyses is possible, though we would encourage judicious application of these methods to address biases judged to be of specific importance for the research question being addressed.

### **4.9.4 Accounting for random and systematic error**

Both systematic errors, such as bias due to misclassification, and random error due to sampling, impact study results. To accurately reflect this issue, quantitative bias analysis

should jointly account for random error as well as systematic bias.<sup>29</sup> Bias formulas, bounding methods, and probabilistic bias analyses can be adapted to account for random error.

#### **4.10 Reporting of methods**

Deficiencies in the reporting of quantitative bias analysis have been previously noted.<sup>1, 29-31</sup>

When reporting quantitative bias analysis, it is important to state:

- (1) The method used and how it has been implemented
- (2) Details of the residual bias anticipated (such as which specific potential confounder was unmeasured)
- (3) Any estimates for unknown values that have been used, with justification for the chosen values or distribution for these unknowns
- (4) Which simplifying assumptions (if any) have been made

Quantitative bias analysis is a valuable addition to a study, but as with any aspect of a study, should be interpreted critically and reported in sufficient detail to allow for critical interpretation.

#### **4.11 Other methods**

Commonly applied and broadly applicable methods have been described in this article. Other methods are available in particular settings, and include modified likelihood of the regression function<sup>32, 33</sup>, propensity score calibration using validation data<sup>34, 35</sup>, multiple imputation using validation data<sup>36</sup>, methods for matched studies<sup>3</sup>, and Bayesian bias analysis if a fully Bayesian approach is desired.<sup>37, 38</sup> Methods for dealing with misclassification of categorical variables are outlined in this article, and corresponding methods for sensitivity analysis to address mismeasurement of continuous variables are available.<sup>39, 40</sup>

#### **4.12 Conclusions**

Quantitative bias methods provide a means to quantitatively and rigorously assess the potential for residual bias in non-interventional studies. Increasing the appropriate use, understanding, and reporting of these methods has potential to improve the robustness of clinical epidemiological research and reduce the likelihood of erroneous conclusions.

### **4.13 Tables**

**Table 4.1 Required parameters for quantitative bias analysis formulas and probabilistic bias analysis**

| <b>Confounding</b>   | <b>Selection Bias</b>  | <b>Misclassification</b>  |
|--|--|---|
| <ul style="list-style-type: none"><li>• Prevalence of unmeasured confounder in unexposed</li><li>• Prevalence in exposed (or association between exposure and confounder)</li><li>• Association between confounder and outcome</li></ul> | <ul style="list-style-type: none"><li>• Probabilities of selection into the study for different levels of exposure and outcome</li></ul> | <ul style="list-style-type: none"><li>• Positive predictive value and negative predictive value</li></ul> Or: <ul style="list-style-type: none"><li>• Sensitivity and specificity</li></ul> |

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## **CHAPTER 5. RESEARCH PAPER: PROTON PUMP INHIBITORS AND RISK OF ALL-CAUSE AND CAUSE- SPECIFIC MORTALITY: A COHORT STUDY**

### **Overview**

In this chapter I present a published research paper on the associations between proton pump inhibitor prescribing and both all-cause and cause-specific mortality. In this study I apply a number of methods to diagnose potential residual confounding by unmeasured confounders including negative controls, secondary comparator groups, sensitivity analyses varying time periods, and the high-dimensional propensity score. I also apply E-values to quantify the potential impact of an unmeasured confounder on study findings.

## RESEARCH PAPER COVER SHEET

Please note that a cover sheet must be completed for each research paper included within a thesis.

### SECTION A – Student Details

|                     |   |       |     |
|---------------------|---|-------|-----|
| Student ID Number   | 368990  | Title | Mr. |
| First Name(s)       | Jeremy Philip   |       |     |
| Surname/Family Name | Brown   |       |     |
| Thesis Title        | Application of methods for handling unmeasured confounding in pharmacoepidemiological studies |       |     |
| Primary Supervisor  | Professor Ian Douglas   |       |     |

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

### SECTION B – Paper already published

|  |  |   |     |
|--|--|---|-----|
| Where was the work published?  | British Journal of Clinical Pharmacology |   |     |
| When was the work published?   | 2021                                     |   |     |
| If the work was published prior to registration for your research degree, give a brief rationale for its inclusion |  |   |     |
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|---|--|
| <p>For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)</p> | <p>I designed the study with the guidance of colleagues, conducted all data analyses apart from implementation of the high-dimensional propensity score, and wrote all drafts of the manuscript.</p> |
|---|--|

## **Proton pump inhibitors and risk of all-cause and cause-specific mortality: a cohort study**

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### **What is already known about this subject:**

In non-interventional studies the prescription of proton pump inhibitors (PPI) has been associated with a large number of adverse health outcomes.

In a cohort of US veterans PPI prescription was associated with increased risk of all-cause and cause-specific mortality.

### **What this study adds:**

Individuals prescribed PPIs seem to have poorer health than individuals prescribed alternative acid suppression therapy.

There was an association between PPI prescription and both all-cause (weighted hazard ratio 1.38, 95% CI 1.33-1.44) and cause-specific mortality, but analyses indicate that residual confounding is likely.

Confounding of non-interventional studies investigating PPIs is a major concern, in particular given the potential effect of these studies on patient and prescriber behaviour.

## **5.1 Abstract**

### **Aim**

To investigate the association between proton pump inhibitors (PPIs) and both all-cause and cause-specific mortality.

### **Methods**

We conducted a cohort study using the UK Clinical Practice Research Datalink GOLD database. We compared 733,885 new users of PPIs to 124,410 new users of H2 receptor antagonists [H2RAs]. In a secondary analysis we compared 689,602 PPI new users to 1,361,245 non-users of acid suppression therapy matched on age, sex, and calendar year. Hazard ratios for all-cause and cause-specific mortality were estimated using propensity score (PS) weighted Cox models.

### **Results**

PPI prescription was associated with increased risk of all-cause mortality, with hazard ratios decreasing considerably by increasing adjustment (unadjusted hazard ratio [HR] 1.65, 95% confidence interval [CI] 1.62-1.69; PS-weighted HR 1.38, 95% CI 1.33-1.44; high-dimensional PS-weighted HR 1.31, 95% CI 1.26-1.37). Short-term associations were observed with mortality from causes where a causal short-term association is unexpected (e.g., lung cancer mortality: PS-weighted HR at 6 months 1.77; 95% CI 1.39-2.25). Adjusted hazard ratios were substantially higher when comparing to non-users (PS-weighted HR all-cause mortality 1.96, 95% CI 1.94-1.99) rather than H2RA users.

### **Conclusions**

PPI prescription was strongly associated with all-cause and cause-specific mortality. However, the change in hazard ratios by (1) increasing adjustment and (2) between comparator groups indicate that residual confounding is likely to explain the association between poor health outcomes and PPI use, and fully accounting for this using observational data may not be possible.

**Keywords:** mortality, proton pump inhibitor, H2 receptor antagonist

## **5.2 Introduction**

Proton pump inhibitors (PPIs) are a group of commonly prescribed drugs used to suppress gastric acid production. They are prescribed for a variety of indications including the treatment of dyspepsia, peptic ulcers, and gastro-oesophageal reflux disease, the eradication of *H. pylori*, and prophylaxis to prevent drug-induced gastrointestinal damage (e.g., from non-steroidal anti-inflammatory drugs [NSAID]).

Concern over the safety of PPIs has grown, given associations observed in non-interventional studies between PPI use and a range of outcomes including pneumonia, chronic kidney disease, cancer, and alcoholic liver disease <sup>1-9</sup>. Furthermore, recent non-interventional studies identified associations between PPI prescription and increased all-cause and cause-specific mortality <sup>7, 10-12</sup>.

Previous safety concerns about PPIs have highlighted important limitations of statistical techniques used to account for differences between PPI users and non-users in non-interventional studies; several studies identified a harmful association between combined clopidogrel and PPI use, whilst randomised controlled trials (RCTs) found no clinically relevant interaction <sup>13</sup>. Given that PPIs are globally one of the most frequently used classes of drugs, it is vital that we are able to reliably evaluate their potential risks and benefits when making treatment decisions.

In this study we aimed to examine the association between PPIs and all-cause and cause-specific mortality, and to investigate the robustness of results to confounding by (1) applying different methods to adjust for confounding, (2) using different comparator groups, (3) examining the pattern of the associations across different time periods, 4) and including control outcomes not previously associated with PPI use.

## **5.3 Methods**

We conducted a cohort study comparing mortality among new users of PPIs to, in the first instance, new users of an alternative acid suppression drug, H2 receptor antagonists (H2RAs), and as a secondary analysis to non-users of either H2RAs or PPIs.

### **5.3.1 Data source**

The Clinical Practice Research Datalink (CPRD) GOLD database consists of primary care electronic medical records of people registered at one of over 700 general practices in the United Kingdom (UK). The dataset is widely validated for epidemiological research and broadly representative of the UK population in terms of age, sex and ethnicity <sup>14</sup>. Our study included the subset of CPRD GOLD practices that have consented to linkage with other datasets.

We incorporated linked data from the Office of National Statistics (ONS) death registration data, Hospital Episode Statistics Admitted Patient Care (HES APC) data, and Index of Multiple Deprivation (IMD) data. Date and cause of death were ascertained from ONS death registration data. In the UK all deaths are registered and cause of death is certified by a clinician. The number of hospital admissions in the 6 months prior to study entry, a covariate, was calculated from HES APC <sup>15</sup>. Socioeconomic deprivation, another covariate, was ascertained from postcode-based IMD data. The IMD is an index of relative socioeconomic deprivation based upon seven domains, which include income, employment, education and health <sup>16</sup>.

### **5.3.2 Study population**

We included all adults in CPRD GOLD who were eligible for person-level linkage to HES APC and ONS, had acceptable research standard data, and who were prescribed a PPI or H2RA for the first time on or after the latest of: their 18<sup>th</sup> birthday, date of registration at current practice plus 1 year, first appointment with clinician after registration at current practice, date practice began contributing research quality data plus 1 year, or 02/01/1998 (start of ONS data coverage).

In a secondary analysis, to identify the extent to which confounding by indication may be an issue, we compared PPI users to matched non-users. We would expect similar results from both comparisons (PPI/H2RA and PPI/non-user) if our statistical models control for all confounding, and assuming no causal effect of H2RAs on mortality.

In calendar date order PPI users were matched to non-users of either acid-suppression medication (PPI or H2RA), who met the same date-based eligibility criteria as PPI users, on year of birth (+/- 2 years), sex, calendar year, and clinical practice. Up to two non-users meeting the matching criteria, and with the closest year of birth, were randomly matched (without replacement) to each PPI user. PPI and H2RA users were eligible as potential non-users prior to first PPI/H2RA prescription.

Cohort entry was defined as date of prescription for H2RA and PPI users, and for non-users as cohort entry date of matched PPI user. We followed individuals up until the earliest of death date, date the individual was no longer registered with the practice, date of last practice data collection, 17/04/2017 (end of coverage period of included ONS mortality data), date of first PPI prescription (H2RA users and non-users), or date of first H2RA prescription (non-users only).

### **5.3.3 Exposure**

Prescription of a PPI ([omeprazole](#), [lansoprazole](#), [pantoprazole](#), [rabeprazole](#) or [esomeprazole](#)) was the main exposure of interest. Choice of comparator group is an important consideration in observational studies of drug effects, with an active comparator generally considered the best approach to mitigate confounding. H2RA prescription ([cimetidine](#), [ranitidine](#), [famotidine](#), [nizatidine](#)) was therefore chosen as the main comparator given that H2RAs are a gastric-acid suppressing medication used for similar indications to PPIs. PPIs are predated by H2RAs, but are now the most commonly prescribed acid-suppression therapy in the UK with superior efficacy observed for many indications in RCTs<sup>17-20</sup>. Key protein targets and ligands in this article are hyperlinked to corresponding entries in <http://www.guidetopharmacology.org>, and are permanently archived in the Concise Guide to Pharmacology 2019/20<sup>21,22</sup>.

### **5.3.4 Covariates**

We adjusted for demographic and lifestyle variables, potential indications for PPI treatment, indicators of frailty, previous comorbidities and calendar year in our statistical models (Table 5.1 - further detail provided in supplementary methods).

### **5.3.5 Outcomes**

All-cause mortality was the primary outcome. Cause of death was ascertained from the International Classification of Diseases (ICD) 9 or 10 code recorded for the underlying cause



of death on the death certificate. Secondary outcomes included cause-specific mortality: 1) categorised into groupings used in the Global Burden of Diseases Study<sup>23,24</sup>; 2) *a priori* causes that have previously been associated with PPIs; and 3) control outcomes we would not expect to be associated with PPIs.

Global Burden of Diseases Study groupings included the high-level categories of cause-specific mortality: communicable disease, non-communicable disease, and injury/external cause. Global Burden of Diseases groupings also included the lower-level categories: neoplasms; cardiovascular/circulatory; chronic respiratory diseases; liver cirrhosis; digestive other than cirrhosis; neurological; mental and behavioural; diabetes, urogenital, blood and endocrine; and musculoskeletal.

We included pre-specified individual causes of death where the cause was:

- Previously associated with PPIs and a short-term causal association was considered plausible: pneumonia, acute kidney injury, *C. difficile* enterocolitis, atrial fibrillation/flutter, heart failure, and aortic aneurysm
- Previously associated with PPIs but where a short-term causal association was considered to be unexpected based on disease pathogenesis: dementia and Alzheimer's, chronic kidney disease, hypertensive heart disease, ischaemic heart disease, lung cancer, mesothelioma, breast cancer, liver cancer, prostate cancer, gastric cancer, alcoholic liver disease, and chronic obstructive pulmonary disease (COPD)

We also included, as control outcomes, individual causes of mortality that had not been previously associated with PPIs: accidental trauma (excluding falls), and pulmonary embolism. We did not expect an association between PPI use and accidental trauma, which is unlikely to be confounded by underlying health status, whereas the association with pulmonary embolism may be affected by unmeasured differences between PPI exposed and unexposed individuals.

ICD codes for all outcomes are included in supplementary table S1.

### **5.3.6 Statistical analysis**

Propensity scores were used to adjust for differences in baseline covariates<sup>25</sup>. We generated propensity scores for PPI prescription using logistic regression, or conditional logistic regression (in the case of the matched non-user cohort<sup>26</sup>). In the PPI/non-user matched

analysis the matching factors age, sex, and calendar year were excluded from the conditional logistic regression model. In the PPI/H2RA analysis propensity scores were estimated separately within each category of calendar year (1998-2003, 2004-2009, 2010-2015) given strong trends in prescribing of the two drugs over time.

A missing indicator approach was used for missing covariate information (for BMI, smoking status, and alcohol consumption). The missing indicator method has been found to be unbiased for propensity score analysis under assumptions that may be more plausible in the context of electronic health records than the complete records approach <sup>27</sup>.

Estimated propensity scores were incorporated using average effect of treatment in the treated (ATT) weights. These weights estimate the average effect of treatment among individuals similar to the treated (PPI users) rather than in the overall study population <sup>28</sup>. ATT weights were chosen to increase comparability between the PPI versus H2RA, and PPI versus non-user analyses. By using ATT weights our effect estimates in both the PPI/H2RA and PPI/non-user comparisons pertain to the same population, PPI users.

ATT weighted Cox regression models, or ATT weighted stratified Cox regression models (in the case of the matched non-user cohort), were used to estimate the relative risk of each mortality outcome with PPI exposure over 0 to 6 months (censoring follow-up at 6 months), 0 to 1 year, 0 to 10 years, and over all follow-up <sup>29</sup>. An early increase in risk for associations where a short-term association with outcome incidence is unexpected causally (based on disease pathogenesis) may indicate residual confounding.

As a secondary analysis, high-dimensional propensity scores (hd-PS) were used to investigate residual confounding of the primary analysis. The hd-PS approach selects a large number of covariates (500 in our study), prioritising for inclusion those with the greatest potential to confound the association of interest <sup>30</sup>. It has been suggested that the hd-PS may control for additional confounding by adjusting for proxies of unmeasured covariates (see supplementary methods for further detail).

Sensitivity analyses included: 1) direct adjustment for covariates in the Cox model rather than propensity score weighting, 2) defining cause of death based on *any* listed cause rather than restricting to primary cause of death, 3) censoring follow-up at first PPI/H2RA treatment break (further detail in supplementary methods), 4) censoring follow-up at first prescription of an H2RA among PPI users, 5) censoring follow-up on 31<sup>st</sup> December 2014 in order to only

include follow-up when PPIs were solely available through pharmacy or prescription in the UK, rather than more generally in shops, 6) a post-hoc analysis excluding gastric cancer deaths from the definition of neoplasms deaths, and 7) propensity score trimming excluding individuals with propensity scores outside the range [0.1, 0.9] to assess sensitivity of findings to extreme weights<sup>31-33</sup>. Additionally, to quantify sensitivity to unmeasured confounding we calculated, using e-value formulae, the strength of association that an unmeasured confounder would need to have with exposure or outcome to fully explain the observed association<sup>32</sup>.

All analyses were conducted using Stata MP Version 15.

## **5.4 Results**

The primary cohort consisted of 733,885 new users of PPIs and 124,410 new users of H2RAs (figure 5.1). PPI users were on average older, more often male, and had a higher baseline prevalence of comorbidities and co-medication use (table 5.2). Covariate balance improved after propensity score weighting with absolute standardised differences below 0.1 for all measured covariates.

### **5.4.1 Risk of mortality relative to H2RA users**

There were 95,489 (26.5 per 1,000 person-years [PY]) deaths observed among PPI users and 8,800 (16.1 per 1,000 PY) among H2RA users. Median follow-up was 4.1 years (interquartile range [IQR] 1.8-7.2) among PPI users and 3.0 years (IQR 0.8-7.0) years among H2RA users.

The risk of all-cause mortality was greater among PPI users relative to H2RA users (ATT weighted hazard ratio [wHR] 1.38; 95% confidence interval [CI] 1.33-1.44; figure 5.2). At the broadest level, cause-specific mortality was elevated from communicable (wHR 1.40; 95% CI 1.22-1.60), and non-communicable (wHR 1.39; 95% CI 1.34-1.45) diseases but not from injuries/external causes (wHR 1.00; 95% CI 0.78-1.26).

By more specific cause-of-death category, mortality was higher in PPI users compared to H2RA users from neoplasms (wHR 1.74; 95% CI 1.63-1.86), cardiovascular/circulatory causes (wHR 1.17; 1.10-1.25), chronic respiratory diseases (wHR 1.40; 95% CI 1.22-1.62), liver cirrhosis (wHR 1.95; 95% CI 1.10-3.46), digestive causes other than cirrhosis (wHR 1.43; 95% 1.20-1.69), and diabetes, urogenital, blood and endocrine causes (wHR 1.27; 1.06-1.51). Excluding gastric cancer deaths from neoplasms made little difference to the effect estimate for neoplasms mortality (wHR 1.72; 95% CI 1.61-1.83). There was no evidence of an increased risk of mortality from neurological, mental and behavioural, or musculoskeletal causes.

There was strong evidence of an association with mortality from a number of individual causes previously associated with PPI use including pneumonia, cardiovascular events, cancer, alcoholic liver disease, and chronic obstructive pulmonary disease. There was no evidence for an association with the control outcome of mortality due to accidental trauma excluding falls (wHR 1.05; 95% CI 0.69-1.59), and the hazard ratio for the second control outcome, mortality from pulmonary embolism, was raised but had wide confidence intervals (wHR 1.33; 95% CI 0.85-2.09).

Adjustment via weighting reduced all hazard ratios (figures 5.2 and 5.3). For most outcomes, further adjustment using the hd-PS, reduced hazard ratios further towards the null (compared to a propensity score based on investigator chosen covariates).

#### **5.4.2 Risk over different time periods**

Examining hazard ratios comparing PPI and H2RA users at different time points revealed that, for many of the outcomes, including outcomes (lung, liver and breast cancer) where a short-term causal association was unexpected, an association was apparent within 6 months of treatment initiation (figures 5.4 and 5.5, supplementary figure S1). For all-cause mortality the weighted hazard ratio was 1.34 (95% CI 1.25-1.43) over the first 6 months.

#### **5.4.3 Non-user comparison**

For the secondary non-user comparison, 689,602 PPI users were matched (on age, sex, calendar year and clinical practice) to 1,361,245 non-users of acid suppression therapy (figure 5.1). No suitable match could be found for 44,283 (6%) of PPI users (characteristics of matched/non-matched patients in supplementary table S6). Matched non-users, relative to both PPI users and H2RA users, had a lower baseline prevalence of several comorbidities, and a lower mean number of GP appointments in the 6 months prior to cohort entry date (supplementary 1 table S7).

#### **5.4.4 Risk of mortality relative to non-users**

There were 86,825 (24.8 per 1,000 PY) deaths observed among matched PPI users and 69,402 (11.5 per 1,000 PY) deaths among non-users. Median follow-up was 4.3 (IQR 1.9-7.5) years among matched PPI users and 3.6 years (IQR 1.6-6.5) among non-users.

Weighted hazard ratios for all outcomes (with the exception of acute kidney injury, aortic aneurysm and COPD) were greater for PPI users compared to non-users, than for PPI users compared to H2RA users (figures 5.2 and 5.3). For PPI use, relative to non-use, the weighted hazard ratio for all-cause mortality was 1.96 (95% CI 1.94-1.99) which was substantially higher than the comparison with H2RA users (wHR 1.38; 95% CI 1.33-1.44). Similarly, cause-specific mortality was substantially higher for a number of outcomes such as mortality from neoplasms (3.74, 95% CI 3.63-3.84 vs. 1.74, 95% CI 1.63-1.86), liver cirrhosis (4.10, 95% CI 3.36-5.01 vs. 1.95, 95% CI 1.10-3.46), and gastric cancer (14.59, 95% CI 11.16-19.08 vs. 2.35, 95% CI 1.39-3.99).

#### **5.4.5 Sensitivity analysis**

To fully explain the lower bound of the observed association (HR 1.33) with all-cause mortality an unmeasured confounder would need to be associated with either exposure or outcome by at least RR 1.99 (risk ratio) and associated with both exposure and outcome by at least RR 1.33<sup>32</sup>.

Differences between estimates obtained from direct adjustment for covariates in the Cox model (adjusted HR all-cause mortality 1.39, 95% CI 1.35-1.42) relative to propensity score weighting (wHR 1.38, 95% CI 1.33-1.44) were minor (supplementary tables S8 and S9). Censoring follow-up among PPI users at first prescription of a H2RA similarly had minimal impact on effect estimates (wHR all-cause mortality 1.36, 95% CI 1.31-1.41; supplementary table S10). Censoring follow-up at treatment discontinuation consistently reduced effect estimates (wHR all-cause mortality 1.12, 95% CI 1.04-1.20; supplementary table 11) which may reflect both reduced follow-up and informative censoring whereby treatment is discontinued prior to death. Censoring follow-up at 31<sup>st</sup> December 2014 before PPIs became more widely available had little impact on effect estimates (wHR all-cause mortality 1.41, 95% CI 1.36-1.47; supplementary table S12). The differences between estimates of cause-specific mortality when defining cause of death based on any recorded, rather than primary recorded cause, were small (supplementary table S13). Propensity score trimming had minor effect on estimated associations (supplementary table S14 and S15).

## **5.5 Discussion**

In this cohort study we found associations between prescription of PPIs and both all-cause and cause-specific mortality. However, our findings also clearly indicated there are important differences between PPI users and comparator groups on characteristics predictive of death. PPI users were sicker and in order to draw any causal conclusions from these findings we must first decide whether these baseline differences were fully captured by measured covariates.

In line with previous non-interventional studies, at baseline PPI users had a higher prevalence of measures of comorbidity and indicators of frailty, both when compared to H2RA users and even more so when compared to non-users<sup>10,34</sup>. We would therefore expect the PPI users to have a higher risk of mortality than either comparator group, which may bias a causal assessment of the observed association with PPIs.

With both comparator groups (H2RAs and non-users), hazard ratios decreased towards the null with increasing adjustment, indicative of increasing control of confounding. The unweighted hazard ratio for all-cause mortality was 1.65, which decreased to 1.38 after adjustment for covariates chosen by the study investigator, and to 1.31 after adjustment for the hd-PS (a methodology that has been suggested to control for additional confounding in studies using electronic health record data)<sup>30</sup>. However, it is not clear whether all confounding was fully controlled by any of these approaches. The hd-PS, as with any covariate adjustment method, requires confounders (or proxies of those confounders) to be measured to eliminate confounding.

Success in adjusting for confounding in all non-interventional studies hinges on the quality and completeness of data recording for all relevant variables. If we had accounted for all confounding, and the associations we reported were causal, we would expect the adjusted effect size to be very similar for both the non-user and H2RA comparator groups. However, the adjusted effect estimates were substantially higher when PPI users were compared to non-users, rather than H2RA users. This suggests residual confounding in one or both of these comparisons.

Our estimates are consistent with, though slightly higher than those observed in a cohort of United States veterans in a non-interventional study examining the association between PPIs and all-cause mortality<sup>10</sup>. In this previous cohort, the unadjusted and adjusted hazard ratios

for all-cause mortality were 1.46 (95% CI 1.43-1.49) and 1.25 (95% CI 1.23-1.28), compared to 1.65, 95% CI 1.62-1.69 and 1.38 (1.33-1.44) in our study.

We did not find an association with the control outcome, mortality from accidental trauma excluding falls, which is expected given that this is less likely than other causes of death to be strongly related to health status. There was weak evidence for an association with the control outcome of mortality from pulmonary embolism, an outcome which might be affected by differences in underlying frailty between comparator groups, though confidence intervals were wide as this outcome was relatively rare in our cohort.

We found associations within six months of commencing PPI therapy for a number of very varied diseases that typically have a prolonged course from initial development to diagnosis (e.g., lung cancer). If causal, they would represent the actions of PPI on prevalent disease which could only be explained by a wide range of distinct biological mechanisms since the diseases themselves have different aetiologies and patterns of progression. Alternatively, such short-term associations could be explained by confounding, whereby PPIs are prescribed for symptoms in the early stages of a serious progressive illness. Notably, short-term associations are generally not reported in non-interventional studies of drugs as they are judged as unlikely to be causal, but we believe that reporting them is informative in showing a more rounded picture of the general problem of confounding.

Randomised controlled trials have not replicated the findings from non-interventional studies, providing further evidence that non-interventional studies are likely confounded. A recent randomised placebo-controlled trial of 17,598 patients with stable cardiovascular disease (median follow-up of 3.01 years) found no association between PPI use and all-cause mortality (HR 1.03, 95% CI 0.92–1.15), mortality from cardiovascular causes (HR 1.03, 0.89–1.20), or mortality from non-cardiovascular causes (1.02, 95% CI 0.87–1.21)<sup>35</sup>. Whilst it could be argued that any causal association may require a longer duration of exposure, these results at least mitigate against a short-to-medium-term effect of PPIs on undiagnosed disease. No association was observed in the RCT with incidence of cause-specific mortality outcomes previously associated with PPI use in non-interventional studies including cancer, chronic kidney disease, dementia, pneumonia and COPD. The one exception to these negative findings was an increased incidence of enteric infections.

Previous non-interventional studies found differences in patient baseline characteristics similar to those observed in our study<sup>10, 34, 36</sup>. The range of comorbidities that are more



prevalent among PPI users reflects the multiple indications for, and broad patient population prescribed, PPIs. No observational study can deal with unmeasured confounding, and in the case of prescribing of PPIs the data suggest that they are given at a greater rate to people who are frail, but we cannot fully assess how frail they may be. An unmeasured confounder associated with both exposure and outcome by a risk ratio of at least 1.33, and with either by at least 1.99, could potentially fully explain the observed association<sup>32</sup>. Given strong associations previously observed between frailty and mortality ( $RR > 2$ ) and the possibility that more than one relevant variable may be under- or un-recorded, such unmeasured confounding is plausible<sup>37</sup>. This could be related to either the recording of presence or absence of a disease, but possibly more importantly, could also be related to the severity of a disease. For example, PPI users may have not only a higher prevalence of diseases such as hypertension and diabetes; they may also have more severe disease, which is less readily captured through routine health records.

Residual confounding may explain the wide ranging associations with PPI use observed both in the literature, where PPIs have been associated with over a dozen conditions, and in this study with cause-specific mortality from a number of causes<sup>1-9, 38-40</sup>. Notably, non-interventional research on the interaction between clopidogrel and PPIs similarly suffered from hard to account for confounding, and ultimately randomised trials suggested the harmful associations detected in many studies were not causal<sup>41, 42</sup>.

Our study has several strengths. It is the largest study to date to examine the association of PPI prescription with all-cause and cause-specific mortality. Furthermore, our population was broadly representative of patients taking PPIs in the general population, given that the database used, CPRD GOLD, is similar to the UK population on age, sex, and ethnicity<sup>14</sup>. The validity of health data recording in CPRD GOLD has been found to be very high<sup>43</sup>.

There were limitations to our study. We expect some misclassification of acid-suppression drug usage as the data capture primary care prescriptions, but not over-the-counter or pharmacy medications sold without a prescription. However, sensitivity analysis limiting the study period to when PPIs were solely available through prescription or pharmacy (before January 2015), had little effect on results. Given the large number of cause-specific mortality associations estimated, which increases the risk of observing some statistically significant associations that are purely due to chance, caution is warranted in the interpretation of any one individual association.

There will have been some misclassification due to non-adherence to prescribed medication, which is not recorded in these electronic health records. Assuming such misclassification was non-differential with respect to the outcome, this would tend to bias any causal association towards the null. There may be some misclassification of cause of death due to incorrect attribution of cause by the clinician certifying the death certificate. However, we expect misclassification to be non-differential with respect to PPI prescribing. Propensity score trimming did not lead to a systematic or major change in the hazard ratios, which we might have anticipated had it led to more valid estimates.

We have demonstrated that PPIs are associated with an increased risk of mortality from a wide range of illnesses. However, PPIs are preferentially given to people at increased risk of death. The change in hazard ratios with increasing adjustment and between comparison groups is indicative of residual confounding, and as such, we believe causality is unclear. Randomised trials are generally the ideal source of evidence to answer important questions about drug safety, but are not always available in sufficient size. Whilst non-interventional studies can often be helpful in assessing drug safety, we have presented an example where extra caution is needed in their design and reporting due to intractable confounding. We recommend a strong emphasis on informative sensitivity analyses, such as negative controls and quantitative bias analyses, to assess this problem in order to inform appropriate interpretation and application to clinical practice.

As with all medications, care should be taken to ensure PPIs are prescribed appropriately and for the correct duration. What is clear is that PPIs have a well-defined clinical benefit, and that uncertainty over their safety can lead to adverse unintended consequences <sup>44</sup>.

## **5.6 Acknowledgments**

This study evolved from an earlier project conceived and developed by our much missed colleague Adrian Root.

**5.7 Conflict of interests:** JPB, IJD and LS received grant funding from GlaxoSmithKline plc.; LS received grant funding from NIHR, MRC, BHF and Diabetes UK, and is a trustee of the British Heart Foundation; KB received grants from Wellcome, Royal Society, British Heart Foundation, Medical Research Council, and Diabetes UK, and personal fees from Grünenthal outside the submitted work; no other financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

**5.8 Funding:** No specific funding was received for this study. JPB is funded by a GlaxoSmithKline PhD studentship to investigate the application of quantitative bias analysis in pharmacoepidemiology. JT is funded by a MRC London Intercollegiate Doctoral Training Partnership PhD studentship. KB holds a Sir Henry Dale Fellowship jointly funded by Wellcome and the Royal Society (107731/Z/15/Z). IJD is funded by an unrestricted grant from GlaxoSmithKline.

## **5.9 Data availability**

All data were obtained from the Clinical Practice Research Datalink (CPRD). CPRD data can be obtained by researchers following a successful application to CPRD.

This study is based in part on data from the CPRD obtained under licence from the UK Medicines and Healthcare products Regulatory Agency. The data is provided by patients and collected by the NHS as part of their care and support. The interpretation and conclusions contained in this study are those of the author/s alone. The study was approved by the Independent Scientific Advisory Committee (approval number: 17\_252). ONS/HES © (2020), re-used with the permission of The Health & Social Care Information Centre. All rights reserved.

## **5.10 Contributors**

IJD, KM and LT conceived the study. All authors were involved in study design. JPB and JT conducted the data analyses. JPB wrote the initial draft. All authors interpreted the results, contributed to further drafts, and approved the final manuscript.

### **5.11 Ethics**

This study was approved by the London School of Hygiene and Tropical Medicine Research Ethics Committee (reference no. 15655) and by the CPRD Independent Scientific Advisory Committee (ISAC reference 17\_252).

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### **5.13 Tables**

**Table 5.1 Covariates adjusted for in statistical models**

|   |   |
|---|---|
| <b>Demographic and lifestyle variables at baseline</b>                        | Age, sex, index of multiple deprivation score (IMD), body mass index (BMI), smoking status, alcohol consumption   |
| <b>Potential indications for PPI treatment in 6 months prior to baseline:</b> | Prescription for NSAID, aspirin, clopidogrel, oral anticoagulant or corticosteroid, upper gastrointestinal endoscopy, gastric cancer, gastro-oesophageal reflux disease, peptic ulcers, upper gastrointestinal (GI) bleeding, pancreatitis, cirrhosis, oesophagitis, Barrett's oesophagus, and <i>H. pylori</i> infection |
| <b>Indicators of frailty in 6 months prior to baseline</b>                    | Number of hospital admissions, number of general practitioner (GP) appointments, number of different drug types prescribed (based on distinct British National Formulary (BNF) chapters)  |
| <b>Ever recorded previous comorbidities</b>                                   | Hypertension, cardiovascular disease, peripheral artery disease, cerebrovascular disease, chronic obstructive pulmonary disease (COPD), cancer, non-viral liver disease, human immunodeficiency virus (HIV), chronic kidney disease (CKD), dementia, and diabetes mellitus  |
| <b>Other</b>  | Calendar year at cohort entry   |

**Table 5.2 Absolute standardised differences between PPI and H2RA users before and after weighting**

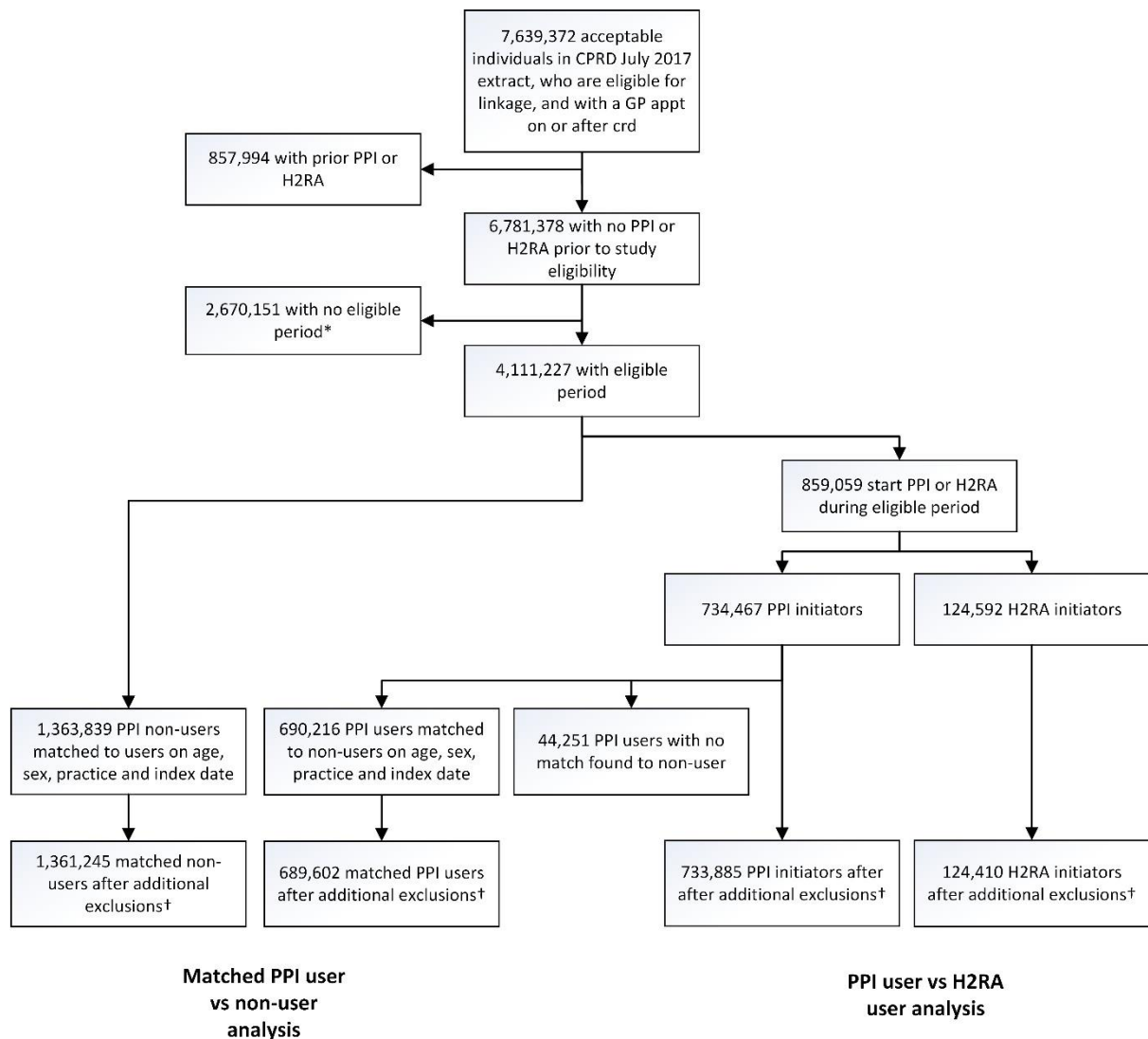
| Characteristic*   | Unweighted |          | Weighted  |          | Unweighted ASD | Weighted ASD |
|---|------------|----------|-----------|----------|----------------|--------------|
|   | H2RA user  | PPI user | H2RA user | PPI user |                |              |
| Effective sample size                                     | 124,410    | 733,885  | 732,547.6 | 733,885  |                |              |
| Mean age in years   | 51.2       | 54.9     | 55        | 54.9     | 0.204          | 0.006        |
| Mean BMI  | 26.5       | 27.2     | 27.2      | 27.2     | 0.118          | <0.001       |
| Calendar year   |            |          |           |          |                |              |
| 1998-2003   | 56.7%      | 14.2%    | 14.2%     | 14.2%    | 1.135          | 0.001        |
| 2004-2009   | 31.3%      | 41.6%    | 41.6%     | 41.6%    | 0.210          | <0.001       |
| 2010-2015   | 12.0%      | 44.2%    | 44.2%     | 44.2%    | 0.678          | 0.001        |
| Female  | 57.3%      | 54.7%    | 54.1%     | 54.7%    | 0.052          | 0.014        |
| Current smoker  | 24.3%      | 19.6%    | 19.7%     | 19.6%    | 0.119          | 0.002        |
| Ex-smoker   | 24.3%      | 33.3%    | 33.2%     | 33.4%    | 0.195          | 0.005        |
| High alcohol intake                                       | 2.7%       | 3.4%     | 3.4%      | 3.4%     | 0.039          | <0.001       |
| Below national median IMD                                 | 49.4%      | 51.8%    | 51.7%     | 51.8%    | 0.048          | 0.002        |
| <b>In 6 months prior to PPI/H2RA treatment initiation</b> |            |          |           |          |                |              |
| Mean no. of hospital admissions                           | 0.3        | 0.4      | 0.4       | 0.4      | 0.052          | 0.001        |
| Mean no. of GP appointments                               | 4.8        | 5.9      | 6         | 5.9      | 0.165          | 0.003        |
| Mean no. of BNF drug chapters                             | 2.3        | 2.5      | 2.5       | 2.5      | 0.078          | 0.016        |
| NSAID   | 21.3%      | 32.1%    | 31.5%     | 32.1%    | 0.236          | 0.012        |
| Aspirin   | 11.7%      | 15.0%    | 14.9%     | 15.0%    | 0.093          | 0.004        |
| Clopidogrel   | 1.6%       | 2.1%     | 2.2%      | 2.1%     | 0.036          | 0.009        |
| Oral anticoagulant  | 2.0%       | 2.4%     | 2.5%      | 2.4%     | 0.022          | 0.01         |
| Inhaled steroid   | 11.4%      | 12.8%    | 13.1%     | 12.8%    | 0.045          | 0.009        |
| Systemic steroid  | 6.7%       | 7.2%     | 7.2%      | 7.2%     | 0.018          | 0.002        |
| GORD  | 7.0%       | 8.4%     | 8.7%      | 8.4%     | 0.052          | 0.009        |
| Oesophagitis  | 2.7%       | 3.5%     | 3.5%      | 3.5%     | 0.048          | <0.001       |
| <b>Ever previous</b>                                      |            |          |           |          |                |              |
| Hypertension  | 19.7%      | 26.1%    | 25.9%     | 26.1%    | 0.149          | 0.005        |
| Coronary heart disease                                    | 8.0%       | 8.2%     | 8.3%      | 8.2%     | 0.01           | <0.001       |

|                           |      |       |       |       |       |        |
|---------------------------|------|-------|-------|-------|-------|--------|
| Peripheral artery disease | 2.0% | 2.2%  | 2.2%  | 2.2%  | 0.013 | 0.001  |
| Cerebrovascular disease   | 3.7% | 4.6%  | 4.8%  | 4.6%  | 0.043 | 0.011  |
| COPD                      | 2.6% | 3.6%  | 3.7%  | 3.6%  | 0.055 | 0.003  |
| Cancer                    | 7.4% | 10.1% | 10.5% | 10.1% | 0.093 | 0.012  |
| CKD                       | 8.8% | 13.9% | 13.9% | 13.9% | 0.15  | 0.002  |
| Diabetes                  | 5.2% | 7.7%  | 7.7%  | 7.7%  | 0.097 | <0.001 |

\* Only covariates with a frequency greater than 2% among PPI users or H2RA users are included in this table. Standardised differences for all measured covariates including those occurring with frequency less than 2% are provided in supplementary table S2.

Abbreviations: ASD, absolute standardised difference; H2RA, H2 receptor antagonist; PPI, proton pump inhibitor; BMI, body mass index; IMD, Index of Multiple Deprivation; GP, General Practitioner; BNF, British National Formulary; GI, gastrointestinal; GORD, gastro-oesophageal reflux disease; COPD, chronic obstructive pulmonary disease; CKD, chronic kidney disease.

## 5.14 Figures

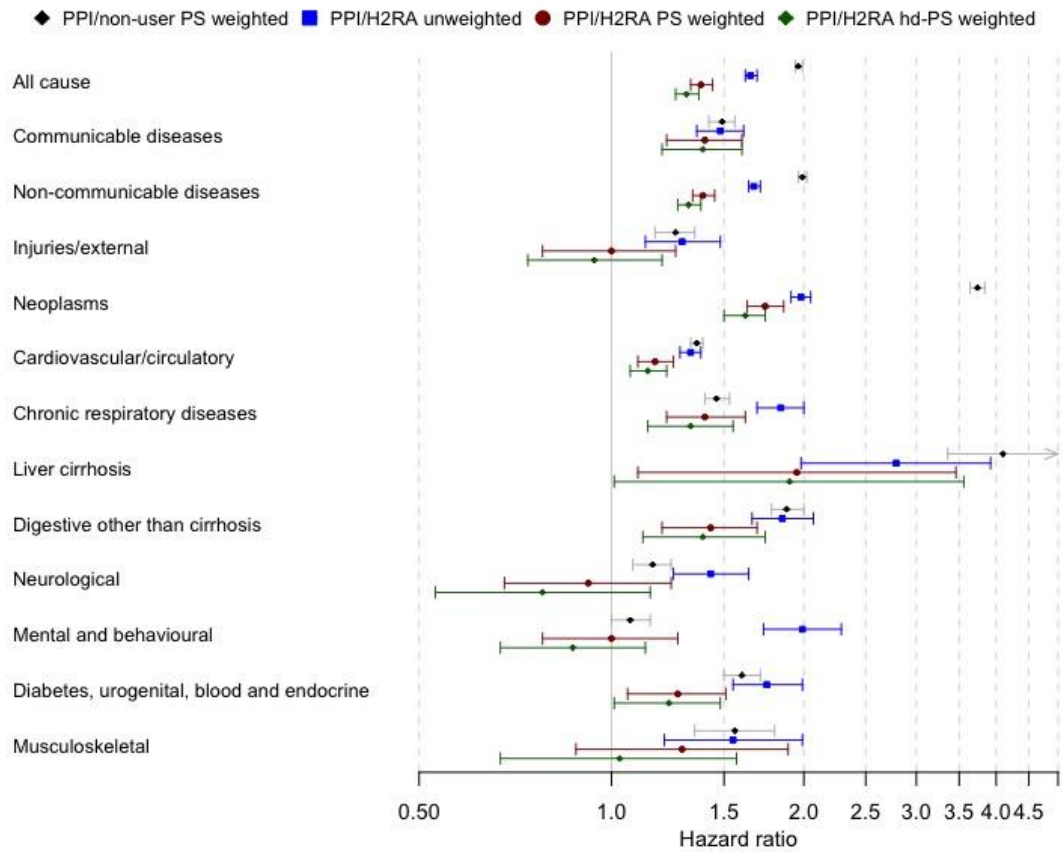


**Figure 5.1 Study flow chart**

\* Beginning of eligibility is latest of on one year after current registration date, one year after up-to-standard date, study start (02/01/1998), 18<sup>th</sup> birthday, and first GP appointment after current registration date. End of eligibility is earliest of transfer out date, last collection date, study end date (31/12/2015) and death date.

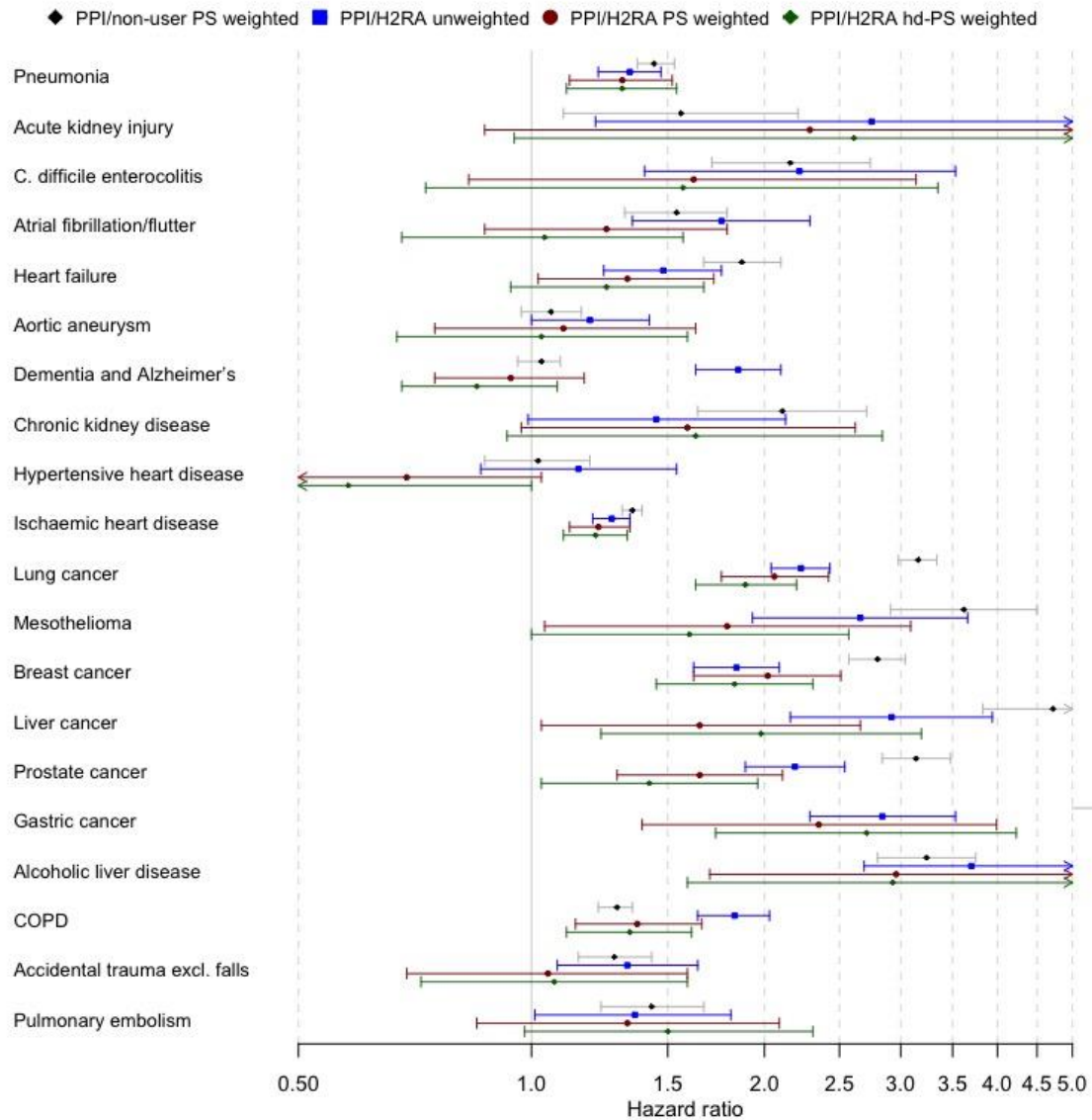
† Additional exclusions occurred to remove individuals with missing Index of Multiple Deprivation data, and when ONS death date obtained.

Abbreviations: CPRD, Clinical Practice Research Datalink; GP, general practitioner; crd, current registration date i.e. date of registration at current practice; PPI, proton pump inhibitor; H2RA, H2 receptor antagonist



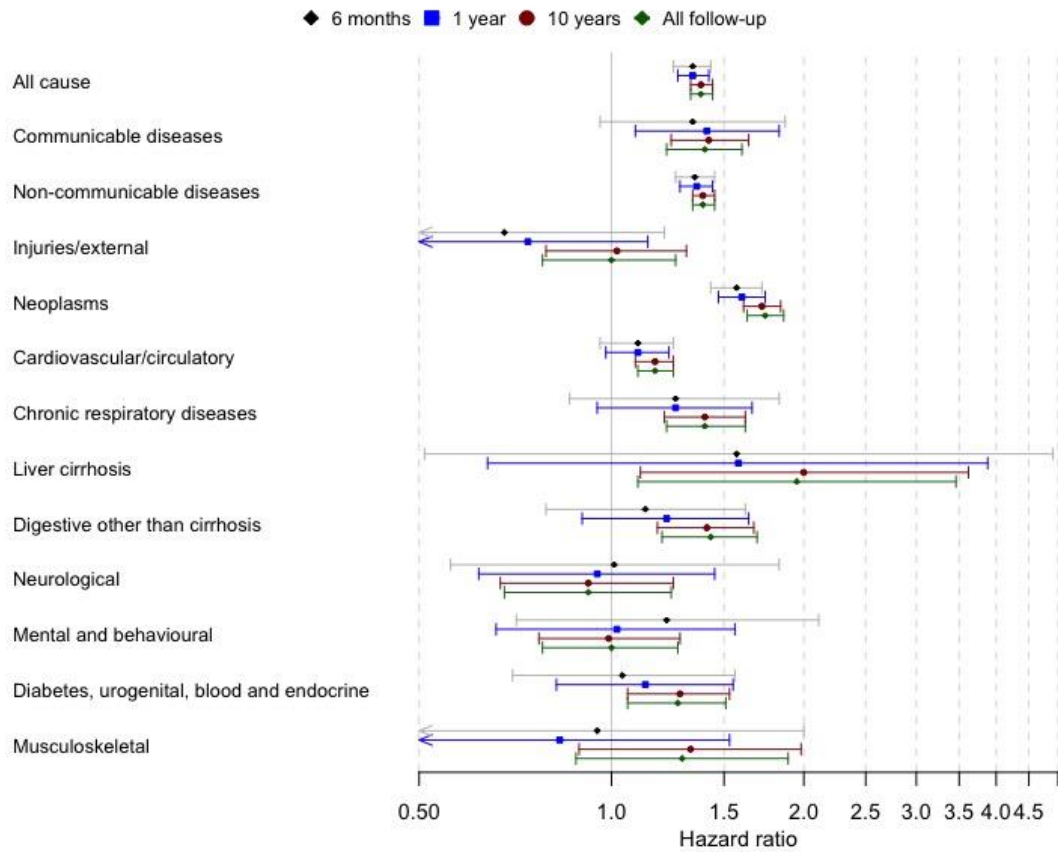
**Figure 5.2 Forest plot of the associations between PPI prescription and both all-cause and cause-specific mortality**

Hazard ratios and 95% CI are plotted here and listed in supplementary tables S3 and S4. Abbreviations: PPI, proton pump inhibitor; PS, propensity score; H2RA, H2 receptor antagonist; hd-PS, high-dimensional propensity score.



**Figure 5.3 Forest plot of the associations between PPI prescription and mortality from individual specified causes**

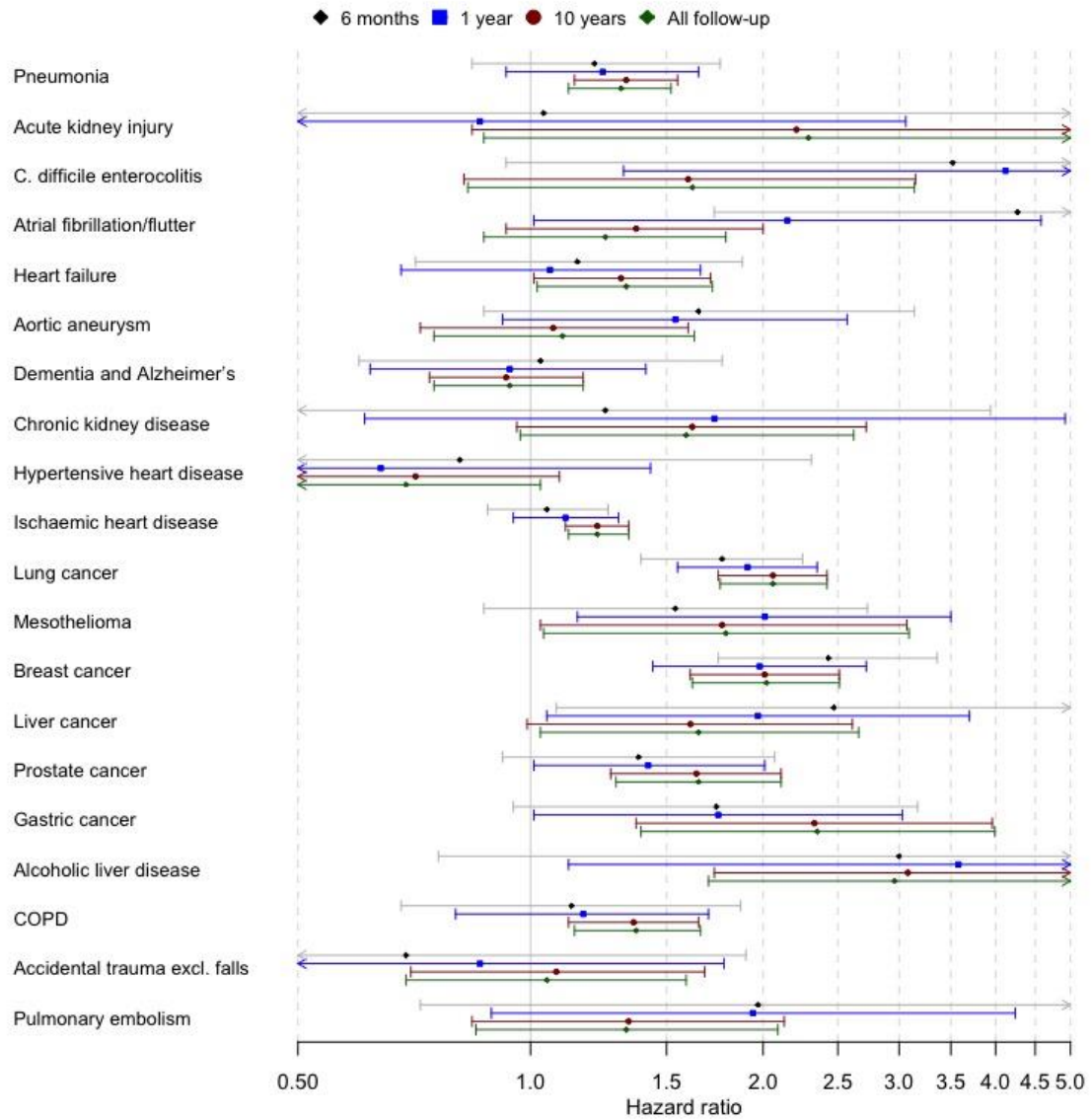
Hazard ratios and 95% CI are plotted here and listed in supplementary tables S3 and S4. For gastric cancer both the unweighted hazard ratio and 95% CI are outside of the x-axis. Abbreviations: PPI, proton pump inhibitor; PS, propensity score; H2RA, H2 receptor antagonist; hd-PS, high-dimensional propensity score.



**Figure 5.4 Forest plot of the associations between PPI prescription and both all-cause and broad-level cause-specific mortality over up to 6 months, 1 year, 10 years, and all follow-up**

Hazard ratios and 95% confidence intervals are plotted here and listed in supplementary table S5. All figures represent propensity score (based on investigator chosen covariates) weighted hazard ratios.





**Figure 5.5 Forest plot of the associations between PPI prescription and mortality from individual causes over up to 6 months, 1 year, 10 years, and all follow-up**

Hazard ratios and 95% confidence intervals are plotted here and listed in supplementary table S5. All figures represent propensity score (based on investigator chosen covariates) weighted hazard ratios.

## **CHAPTER 6. RESEARCH PAPER: ASSOCIATION BETWEEN FLUOROQUINOLONES AND HOSPITALIZATION WITH AORTIC ANEURYSM OR AORTIC DISSECTION**

### **Overview**

In this chapter I present a submitted research paper on the association between fluoroquinolone prescribing and hospitalisation with aortic aneurysm or aortic dissection.

In this paper I use self-controlled designs and active comparators to reduce unmeasured confounding.

## RESEARCH PAPER COVER SHEET

Please note that a cover sheet must be completed for each research paper included within a thesis.

### SECTION A – Student Details

|                     |   |       |     |
|---------------------|---|-------|-----|
| Student ID Number   | 368990  | Title | Mr. |
| First Name(s)       | Jeremy Philip   |       |     |
| Surname/Family Name | Brown   |       |     |
| Thesis Title        | Application of methods for handling unmeasured confounding in pharmacoepidemiological studies |       |     |
| Primary Supervisor  | Professor Ian Douglas   |       |     |

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

### SECTION B – Paper already published

|  |                 |   |                 |
|--|-----------------|---|-----------------|
| Where was the work published?  |                 |   |                 |
| When was the work published?   |                 |   |                 |
| If the work was published prior to registration for your research degree, give a brief rationale for its inclusion |                 |   |                 |
| Have you retained the copyright for the work?*   | Choose an item. | Was the work subject to academic peer review? | Choose an item. |

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### SECTION C – Prepared for publication, but not yet published

|   |  |
|---|--|
| Where is the work intended to be published?                       | JAMA Cardiology  |
| Please list the paper's authors in the intended authorship order. | Jeremy P Brown; Kevin Wing; Clémence Leyrat; Stephen Evans; Kathryn E. Mansfield; Angel YS Wong; Liam Smeeth; Nicholas W Galwey; Ian J Douglas |
| Stage of publication  | Submitted  |

**SECTION D – Multi-authored work**

|   |  |
|---|--|
| <p>For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)</p> | <p>I designed the study with the guidance of colleagues, conducted all data analyses, and wrote all drafts of the manuscript</p> |
|---|--|

## **Association between fluoroquinolones and hospitalization with aortic aneurysm or aortic dissection**

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### **6.1 Abstract**

#### **Importance**

Fluoroquinolone use has been associated with increased hospitalization with aortic aneurysm or dissection (AA/AD) in non-interventional studies, but causality is unclear.

#### **Objective**

To determine the association between fluoroquinolone use and AA/AD using multiple study designs and multiple databases to increase the robustness of findings.

#### **Design**

Cohort and case-crossover studies were conducted separately in two databases of UK primary care records.

#### **Setting**

Clinical Practice Research Datalink Aurum and GOLD primary care records linked to hospital admissions data.

#### **Participants**

Adults with a systemic fluoroquinolone or cephalosporin prescription between 1<sup>st</sup> April 1997 to 31<sup>st</sup> December 2019 were included in cohort studies. Adults hospitalized with AA/AD within the eligibility period were included in case-crossover studies. Cases were matched 1:3

to non-cases on age, sex, index date, and clinical practice to adjust for calendar trends in prescribing.

## **Exposures**

Systemic fluoroquinolone or comparator antibiotic.

## **Main Outcomes and Measures**

Hazard ratios (HR) were estimated in the cohort studies for the association between prescription of fluoroquinolones and AA/AD hospitalization using stabilized inverse probability of treatment weighted Cox regression. Odds ratios (OR) were estimated in the case-crossover studies for the association between systemic fluoroquinolone use and AA/AD hospitalization using a conditional logistic regression model. Estimates were pooled across databases using fixed-effects meta-analysis.

## **Results**

In the cohort studies we identified 3,134,231 adults in Aurum and 452,086 in GOLD prescribed fluoroquinolones or cephalosporins. In crude analyses fluoroquinolone relative to cephalosporin use was associated with increased AA/AD hospitalization (pooled HR 1.28, 95% CI 1.13-1.44,  $p < 0.001$ ), but after adjustment for potential confounders, this association disappeared (pooled adjusted HR 1.03, 95% CI 0.91-1.17,  $p = 0.649$ ). In the case-crossover studies we identified 84,841 individuals hospitalized with AA/AD in Aurum and 10,357 in GOLD. Relative to non-use, fluoroquinolones were associated with increased AA/AD hospitalization, but no association was found relative to other antibiotics (vs. cephalosporin pooled OR 1.05, 95% CI 0.87-1.27; vs. trimethoprim 0.89, 95% CI 0.75-1.06; vs. co-amoxiclav 0.98, 95% CI 0.82-1.18).

## **Conclusions and Relevance**

Our results suggest that associations of fluoroquinolones with AA/AD can be affected by confounding. When such confounding is accounted for no association is evident, providing reassurance on the safety of fluoroquinolones with respect to AA/AD.

## **6.2 Key points**

### **Question**

Does fluoroquinolone use increase the risk of hospitalization with aortic aneurysm or aortic dissection (AA/AD)?

### **Findings**

After covariate adjustment and relative to comparator antibiotics there was no evidence of an association between fluoroquinolone use and AA/AD. This finding was consistent across two databases, Aurum and GOLD, and two study designs, cohort and case-crossover. An association was evident in unadjusted cohort study analyses and relative to non-use in the case-crossover studies, which can be explained by confounding.

### **Meaning**

These findings suggest that fluoroquinolone use may not increase risk of AA/AD hospitalization and may instead be associated with AA/AD due to confounding.

## **6.3 Introduction**

Fluoroquinolones are a class of commonly prescribed and effective antibiotics used to treat a range of infections including urinary tract, prostate, skin and gastrointestinal infections.<sup>1</sup>

There have been safety concerns over fluoroquinolones given adverse events observed with fluoroquinolone use in case reports and non-interventional studies.<sup>2,3</sup> On the basis of these findings, the U.S. Food and Drug Administration (FDA) has over the last decade required a number of warnings be added to fluoroquinolone packaging.<sup>4-7</sup>

One major area of concern has been the safety of fluoroquinolones with respect to aortic aneurysm and aortic dissection (AA/AD). There is a long-recognized association between fluoroquinolones and tendon rupture which, based on cell biology and animal research, has been suggested to be due to the degradation of collagen.<sup>8-10</sup> Given that diseases of the aorta similarly involve the degradation of collagen<sup>11</sup>, a 2015 cohort study investigated the association between fluoroquinolones and AA/AD, finding an increased risk of hospitalization with AA/AD relative to non-use within 30 days of prescription.<sup>2</sup> There have been a number of subsequent related studies, with conflicting findings and differing conclusions on the potential causality of the association.<sup>2, 12-26</sup> It is estimated that abdominal aortic aneurysms are responsible for 1.3% of all deaths in men aged 65-85 in high-income countries.<sup>27</sup> Given the burden of AA/AD, a true causal association with fluoroquinolones would be of concern to clinicians, patients, and regulators.

The aim of this study was to estimate the association between fluoroquinolones and hospitalization with AA/AD using multiple study designs and study populations to increase the robustness of study findings.

## **6.4 Methods**

### **6.4.1 Data Sources**

Clinical Practice Research Datalink (CPRD) Aurum and GOLD are two databases of anonymized routinely collected electronic health records from over a thousand contributing general practices in the United Kingdom (UK). Collectively they contain primary care records of more than 10 million currently registered patients covering more than 20% of the UK population.<sup>28, 29</sup> They hold data from two separate primary care software systems, EMIS (Aurum) and Vision (GOLD). These datasets have been widely used for non-interventional



research and found to be broadly representative of the general population in terms of both age and sex.<sup>29-31</sup>

These primary care datasets were linked to Hospital Episode Statistics Admitted Patient Care (HES APC) and socioeconomic deprivation data. HES APC is a hospital admissions database, which contains the records of all admissions to National Health Service (NHS) hospitals in England.<sup>31</sup> Measures of socioeconomic deprivation are derived based on patient and practice postal codes.<sup>32</sup>

#### **6.4.2 Study design**

We conducted separate cohort and case-crossover studies in Aurum and GOLD to investigate the association between fluoroquinolones and hospitalization with AA/AD.

The case-crossover study is a self-controlled study design in which the frequency of an exposure is compared, within individuals, in the period immediately prior to the outcome relative to an earlier reference period.<sup>33</sup> If the exposure causes the outcome, then we anticipate increased frequency of exposure prior to outcome relative to during the reference period. Whereas in a cohort study we must typically adjust for covariates, the case-crossover study by design eliminates confounding by variables that are time-invariant or vary slowly over time (e.g., sex, genetic conditions). To control for temporal trends in prescribing, cases of hospitalization with AA/AD were matched (age, sex, calendar date, clinical practice) to non-cases. This is an extension of the case-crossover design, referred to as the case-time-control design.<sup>34,35</sup>

#### **6.4.3 Study eligibility**

For both cohort and case-crossover studies, we selected adults aged 18 years or older eligible for linkage to hospital (HES APC) and socioeconomic deprivation data. Individuals from practices present in both databases were excluded from the GOLD cohort.

The eligibility window was defined as starting at the latest of 1<sup>st</sup> April 1997, one year after current registration of patient at practice, 18<sup>th</sup> birthday, and one year after practice data deemed by CPRD to be of research quality (available in CPRD GOLD only). The eligibility window ended at the earliest of 31<sup>st</sup> December 2019, patient transferred out of practice date, death, and date of last data collection at practice.

#### **6.4.4 Cohort studies**

In the cohort studies we estimated the association between fluoroquinolone use, relative to cephalosporin use (an antibiotic used for similar indications), and hospitalization with AA/AD within 60 days of prescription (see eFigure 1 in the supplement for a graphical presentation of study design<sup>36</sup>). Adults with a systemic prescription for either a fluoroquinolone (ciprofloxacin, levofloxacin, moxifloxacin, norfloxacin or ofloxacin) or a cephalosporin within the eligibility window were selected. Adults with Marfan's Syndrome, a systemic genetic condition associated with increased risk of AA/AD, were excluded.

Multiple treatment episodes, defined by prescriptions more than 60 days apart, were included separately. Treatment episodes were censored at the earliest of hospitalization with AA/AD, death, prescription of alternative antibiotic (fluoroquinolone or cephalosporin), and 60 days following prescription. Only treatment episodes starting prior to first hospitalization with AA/AD were included.

#### **6.4.5 Case-crossover studies**

Adults with a first hospitalization for AA/AD within the eligibility window were selected. The frequency of fluoroquinolone prescribing was compared in an exposure risk period 0-60 days preceding the outcome relative to a reference period 90-150 days before the outcome. The association between fluoroquinolone prescribing and AA/AD was assessed relative to non-use and relative to one of several comparator antibiotics: cephalosporin, co-amoxiclav and trimethoprim.

To control for trends in prescribing, cases were matched, on index date, year of birth, sex, and clinical practice 1:3 to adults without a hospitalization for AA/AD (Figure 6.1).

#### **6.4.6 Outcomes**

The primary outcome was hospitalization with AA/AD as determined by an International Classification for Disease 10 (ICD-10) code recorded as a diagnosis on hospital admission in HES APC (i.e., within the first episode of a hospital admission). A positive control outcome, tendon rupture, was included in the cohort studies. There has been a long-recognized association between fluoroquinolone use and tendon rupture and therefore we would expect a positive association with this outcome.<sup>37</sup>

### **6.4.7 Covariates**

In the cohort studies potential confounders were adjusted for (see Box 1).

In the case-crossover studies, covariates were not included, due to the self-controlled design, which accounts for time-invariant confounders by design.

Code lists for the exposure, outcome and covariates are available online at LSHTM Data Compass (<https://doi.org/10.17037/DATA.00003243>).

#### **Box 1. Covariates adjusted for in cohort study**

- **Demographic and lifestyle variables:** age, sex, socioeconomic deprivation, body mass index (BMI), smoking status, alcohol consumption, ethnicity
- **Indicators of frailty and comorbidity in 6 months prior to baseline:** number of hospital admissions, number of GP appointments
- **Ever prior comorbidities:** coronary heart disease, hypertension, diabetes, uncontrolled diabetes, cerebrovascular disease, dementia, HIV, chronic liver disease, chronic kidney disease, peripheral vascular disease, myocardial infarction, carotid disease, multiple sclerosis
- **Additional risk factors for hospitalization with AA/AD:** statin use in 6 months prior, ever prior aortic aneurysm
- **Additional risk factors for tendon rupture:** corticosteroid use in 6 months prior, ever prior rheumatoid arthritis

### **6.4.8 Statistical analysis**

#### **Cohort studies**

In each cohort study covariates were adjusted for using propensity score weighting with stabilized inverse probability of treatment weights.<sup>38</sup> The propensity score was estimated using a multivariable logistic regression model. BMI and age were modelled with a restricted cubic spline.

Individuals with no recorded smoking status were categorized as not current smokers and those with no recorded alcohol consumption as not heavy drinkers.<sup>39</sup> Missingness in ethnicity and BMI was handled using multiple imputation through chained equations with 10 imputed datasets.<sup>40, 41</sup>

To estimate the hazard ratio for hospitalization with AA/AD within 60 days of exposure a weighted Cox proportional hazards model was fitted with robust variance estimation. Proportionality was assessed using a test of Schoenfeld's residuals. Hazard ratios estimates were pooled across databases using fixed-effects meta-analysis.

### **Case-crossover studies**

A conditional logistic regression model was fitted to estimate the odds ratio between use of fluoroquinolones and hospitalization with AA/AD. In the fitted model the main term for period corresponds to the effect of prescribing trends and an interaction term between case and period captures the association between exposure and outcome.<sup>34</sup> Odds ratios relative to comparator antibiotics were estimated using the simple ratio approach for active comparators in self-controlled studies.<sup>42</sup> Odds ratio estimates were pooled across databases through fixed-effect meta-analysis.

### **Sensitivity analyses**

In the cohort studies to assess the robustness of results to missing data assumptions, a sensitivity analysis using a complete case approach was conducted where individuals with missing ethnicity or BMI were excluded. In a post-hoc analysis the hazard ratio was estimated adjusting for sex only to explore the relative contribution to confounding of this variable.

The robustness of the case-crossover studies to time window chosen was assessed in sensitivity analyses by varying the length of exposure risk periods to 30 or 90 rather than 60 days and increasing the interval between case and control period from 30 to 60 days.

Data cleaning and manipulation were performed in Stata 17, with analyses conducted in R version 4.12.

## **6.5 Results**

### **6.5.1 Cohort studies**

In Aurum we identified 3,134,121 adults prescribed 2,279,956 fluoroquinolone treatment episodes and 4,524,703 cephalosporin treatment episodes. In GOLD we identified 452,086 adults prescribed 327,831 fluoroquinolone treatment episodes and 606,374 cephalosporin treatment episodes (eFigure 2).

Individual characteristics at first treatment episode are presented in Table 6.1 (see eTable 1 for characteristics at all treatment episodes). Cephalosporin and fluoroquinolone users were similar for many variables, but a higher proportion of cephalosporin users were female (71% vs. 48% in Aurum, 71% vs 50% in GOLD). Other differences were smaller and included a higher proportion of cephalosporin users treated before 2012 (88.3% vs 73.4% in Aurum, 92.8% vs. 82.6% in GOLD) and who had dementia (2.1% vs. 1.4% in Aurum, 2.0% vs. 1.2% in GOLD). A higher proportion of fluoroquinolone than cephalosporin users had high alcohol consumption (3.4% vs. 2.3% in Aurum, 2.9% vs. 2.0% in GOLD), use in prior 6 months of corticosteroids (7.2% vs. 5.7% in Aurum, 9.5% vs. 7.4% in GOLD) or statins (14% vs 12% in Aurum, 15% vs. 12% in GOLD), or were hospitalized in the prior 6 months (20% vs. 18% in Aurum, 20% vs. 19% in GOLD). Most prescriptions of fluoroquinolones were for ciprofloxacin (at first treatment episode 88.1% in Aurum and 87.7% in GOLD).

In unadjusted Cox regression (Figure 6.2) there was strong evidence of an association at first treatment episode between fluoroquinolone use and hospitalization with aortic aneurysm (pooled unadjusted hazard ratio [HR] 1.28, 95% CI 1.13-1.44,  $p < 0.001$ ). After adjustment for covariates there was no evidence of an association (pooled adjusted hazard ratio [aHR] 1.03, 95% CI 0.91-1.17,  $p = 0.649$ ), a finding which was consistent in both Aurum (aHR 1.04, 95% CI 0.91-1.19) and GOLD (aHR 0.97, 95% CI 0.68-1.38). Similar effect estimates were observed when including all treatment episodes (eTable 2). In sensitivity analyses a complete case approach, excluding individuals with missing BMI or ethnicity, had minimal effect on estimates (eTables 3 and 4). A post-hoc analysis adjusting for sex only resulted in a pooled adjusted hazard ratio of 0.98 (95% CI 0.85-1.12,  $p = 0.736$  – eTable 5).

Strong evidence of an association with tendon rupture was observed as anticipated in both Aurum and GOLD (Figure 6.2), both before and after adjustment (pooled aHR 1.98, 95% CI 1.56-2.50,  $p < 0.001$ ).

### **6.5.2 Case-crossover studies**

Cases hospitalized with AA/AD (84,841 in Aurum and 10,357 in GOLD) were matched 3:1 to controls (254,523 in Aurum, 31,071 in GOLD) on calendar date, year of birth, sex and clinical practice (see eFigure 3, eTables 6 and 7). The majority of cases were male (72% in Aurum, 73% in GOLD) and the median age was 77 in both Aurum and GOLD (interquartile range 70, 83).

Relative to non-use there was strong evidence for a positive association between fluoroquinolone prescribing and hospitalization with AA/AD (pooled odds ratio [OR] 1.58, 95% CI 1.37-1.83,  $p < 0.001$ ) – Figure 6.3. However, risk was elevated for comparator antibiotics (see eTable 8) and compared to the comparator antibiotics there was no evidence for a positive association with fluoroquinolones (Figure 6.3 - fluoroquinolone vs. cephalosporin pooled OR 1.05, 95% CI 0.87-1.27,  $p = 0.591$ ; fluoroquinolone vs. trimethoprim pooled OR 0.89, 95% CI 0.75-1.06,  $p = 0.204$ ; fluoroquinolone vs. co-amoxiclav pooled OR 0.98, 95% CI 0.82-1.18,  $p = 0.852$ ). This finding was consistent in both Aurum and GOLD. Varying the length of the periods under study and the time between periods in sensitivity analyses did not change findings (see eTables 9, 10, 11).

## **6.6 Discussion**

We found no evidence after covariate adjustment of increased hospitalization with AA/AD with use of fluoroquinolones relative to comparator antibiotics. This finding was consistent across study designs, cohort and case-crossover, and across databases, Aurum and GOLD. In the cohort studies, a crude association was observed, but no association was evident after covariate adjustment. In the case-crossover studies an association was apparent relative to non-use, but not relative to comparator antibiotics.

Increased hospitalization with AA/AD observed in the cohort studies in unadjusted analyses appeared to be primarily due to an imbalance in sex of fluoroquinolone and cephalosporin users, with cephalosporin users more likely female. After adjusting for sex there was no evidence of an association. In the case-crossover studies increased acute risk of AA/AD hospitalization was observed relative to non-use for multiple antibiotics, including fluoroquinolones, across different drug classes. Relative to comparator antibiotics no association between fluoroquinolones and AA/AD was evident. One potential explanation is that infection itself may increase risk of AA/AD. In a nested case-control study both genitourinary and lower respiratory tract infections were associated with increased risk of AA/AD hospitalization after adjustment for antibiotic usage.<sup>14</sup> One mechanism by which this could arise is through infected aneurysms, which although rare, frequently rupture.<sup>43</sup> Infections, including both urinary and respiratory tract infections, have previously been found to be associated with increased incidence of myocardial infarction and stroke with potential mechanistic explanations including inflammatory and prothrombotic effects of infection.<sup>44, 45</sup> Given the important role of inflammatory processes in aortic aneurysm development, as evident from animal models<sup>46</sup>, the inflammatory response to infection may also affect aortic aneurysms.

A number of previous studies have presented conflicting findings and come to differing conclusions on the presence and causality of an association between fluoroquinolones and AA/AD hospitalization.<sup>2, 12-26</sup> Most studies identifying an association used non-use, amoxicillin, or azithromycin as comparators.<sup>2, 12, 15-22, 24, 26</sup> It is not clear that these are appropriate comparators: non-users are likely to differ substantially from antibiotic users, in particular they will tend not to have an underlying infection. Amoxicillin and azithromycin have a different prescribing profile from fluoroquinolones.<sup>47</sup> Fluoroquinolones, cephalosporins, trimethoprim, and co-amoxiclav are commonly used to treat urinary tract

infections, whereas azithromycin is not. Amoxicillin is much more commonly used for cough and upper respiratory tract infections. Hence confounding by indication, and in particular by infection type, may explain previously observed associations. Further support for this view comes from null associations observed in earlier studies comparing fluoroquinolones to other antibiotics, namely co-amoxiclav, cephalosporins and combined trimethoprim and sulfamethoxazole (co-trimoxazole).<sup>13-15</sup> Confounding by indication may similarly explain the results of a previous cohort study, in which a strong association was observed relative to azithromycin (aHR 2.57, 95% CI 1.36-4.86), but no association was observed relative to co-trimoxazole (aHR 0.99, 95% CI 0.62-1.57).

Our study has several important strengths. We observed consistent results across different study populations from different databases, which increases the robustness of findings. Our use of comparator antibiotics, multiple study designs, and a positive control outcome likewise increase the reliability of our results. Cohort studies and self-controlled studies control for confounding by different mechanisms and hence consistent results across designs increases the robustness of findings.

One limitation is the potential for misclassification inherent to studies using routinely collected healthcare data. There may be some misclassification of exposure given adherence to prescribed medication is not captured. However, bias is likely to be small given high adherence to prescribed antibiotics among the UK public (estimated at 89% in two surveys<sup>48, 49</sup>). Ruptured aortic aneurysms and aortic dissections leading to death before hospitalization will not be included in our outcome definition. Given these are not anticipated to be differentially related to antibiotic chosen, and specificity of outcome definition is high, bias is expected to be minimal.<sup>50</sup> A further limitation is that most fluoroquinolone prescriptions (~88%) were for ciprofloxacin. While there could be an association with other fluoroquinolones, our findings suggest a class-wide effect is unlikely.

It is not clear for which infectious agents the risk of AA/AD is most increased or the exact mechanism of this increased risk. Further research to provide this information would be useful to inform patient management and infectious disease control and prevention.

Given the need for multiple antibiotics to combat antibiotic resistance, an informed understanding of the safety of the limited number of effective existing antibiotics is critical. Using multiple study designs and multiple databases, adjusting for potential confounders and comparing to antibiotics with similar indications, we consistently found no evidence for an



association with AA/AD hospitalization. This provides reassurance on the safety of fluoroquinolones, at least regarding this particular safety concern.

## **6.7 Acknowledgments**

This study is based in part on data from the Clinical Practice Research Datalink obtained under licence from the UK Medicines and Healthcare products Regulatory Agency. The data is provided by patients and collected by the NHS as part of their care and support. The interpretation and conclusions contained in this study are those of the author/s alone. The study was approved by the Independent Scientific Advisory Committee (protocol number: 20\_106RA). Ethics approval was granted by the LSHTM Research Ethics Committee (ref no 22592).

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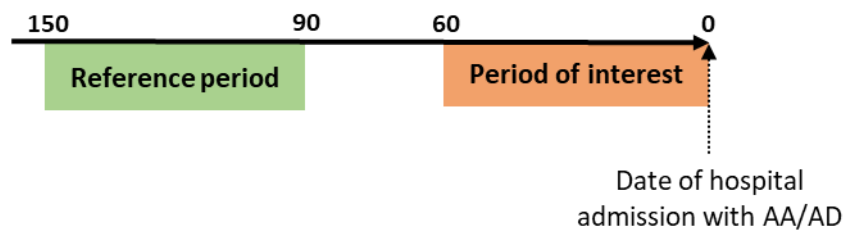
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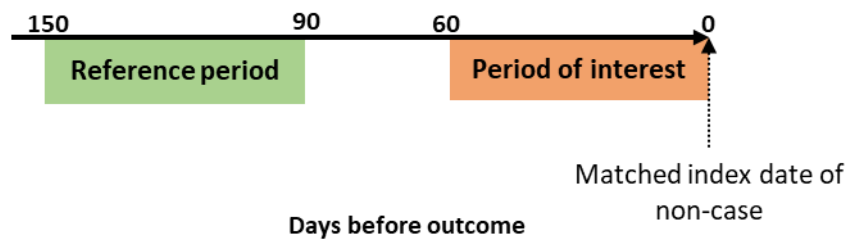
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## 6.9 Figures

### Case: hospital admission with AA/AD



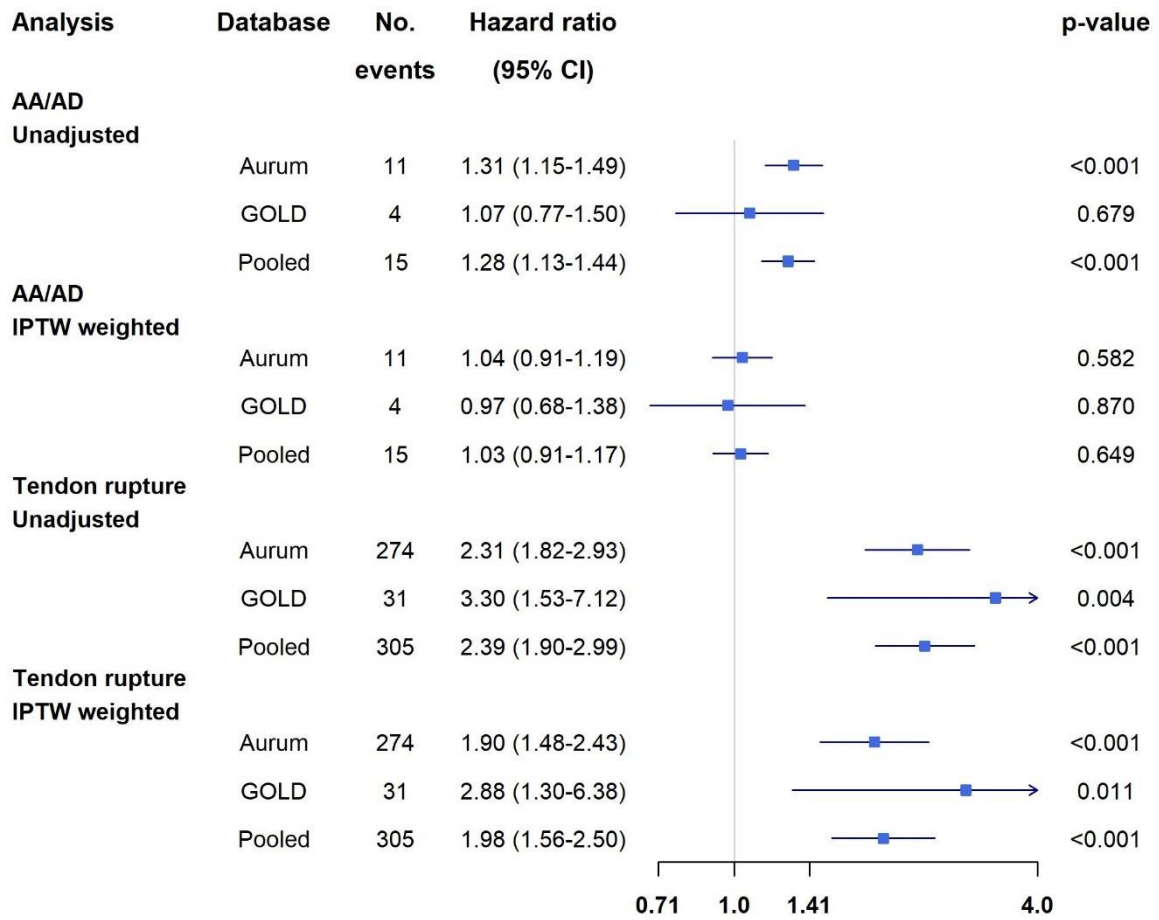
### Control: no hospital admission with AA/AD



**Figure 6.1 Case-crossover study design**

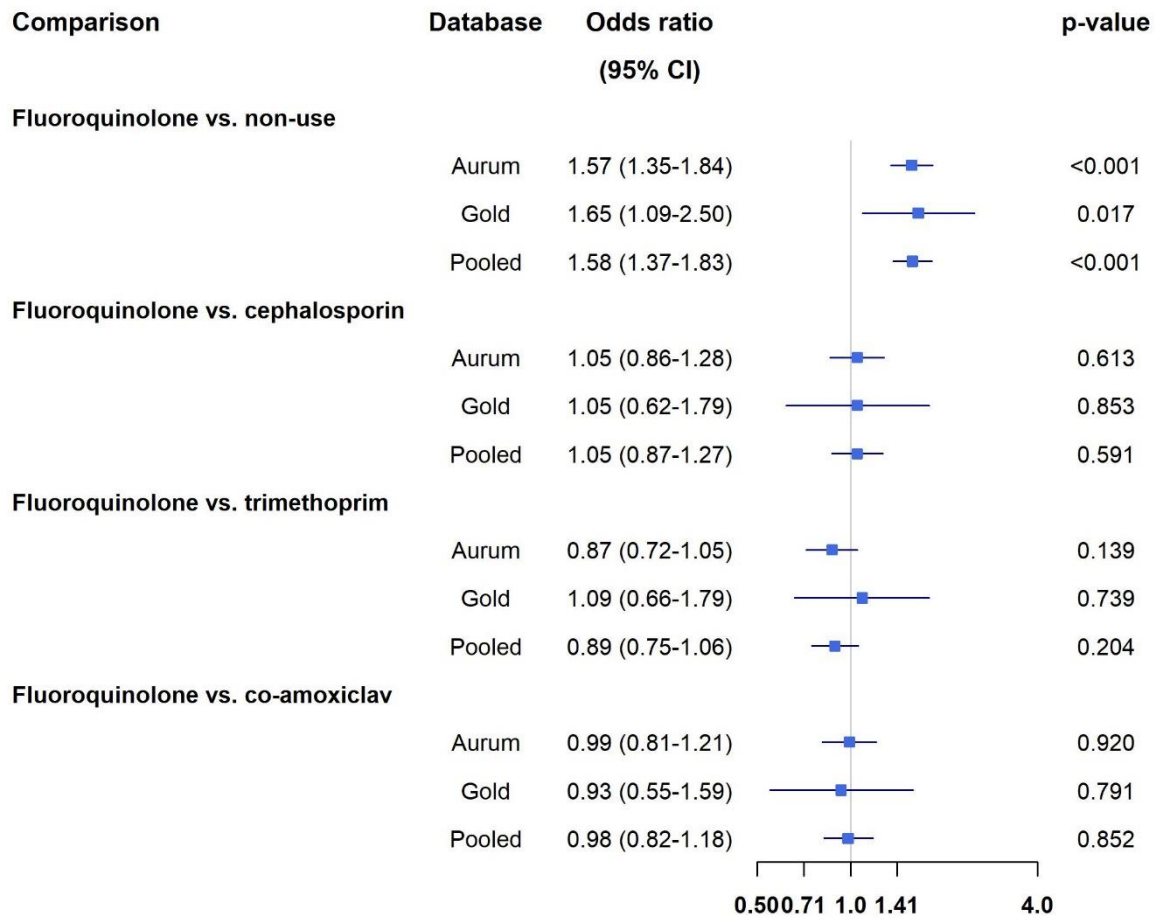
Definitions: AA/AD, aortic aneurysm or aortic dissection. Cases hospitalized with AA/AD were matched 1:1 to controls without AA/AD on calendar date, sex, year of birth and clinical practice. Odds of exposure prior to outcome occurrence relative to reference period were estimated using controls to adjust for trends in prescribing.





**Figure 6.2 Cohort studies - Hazard ratios comparing risk of AA/AD and tendon rupture after fluoroquinolone, relative to cephalosporin, prescription**

Definitions: AA/AD, aortic aneurysm or dissection; CI, confidence interval; IPTW, inverse probability of treatment weight



**Figure 6.3 Case-crossover studies - Odds ratios between fluoroquinolones and hospitalization with AA/AD relative to non-use and comparator antibiotics**

## 6.10 Tables

**Table 6.1 Cohort studies - Baseline characteristics of fluoroquinolone and cephalosporin users at first prescription**

| Characteristic                                       | Aurum                        |                                | GOLD                       |                              |
|--|------------------------------|--------------------------------|----------------------------|------------------------------|
|  | Cephalosporin, N = 2,056,537 | Fluoroquinolone, N = 1,077,584 | Cephalosporin, N = 291,450 | Fluoroquinolone, N = 160,636 |
| Age <sup>1</sup>                                     | 51 (34, 70)                  | 53 (37, 68)                    | 53 (36, 71)                | 55 (39, 70)                  |
| Female   | 1,456,580 (71%)              | 512,677 (48%)                  | 206,929 (71%)              | 79,573 (50%)                 |
| Calendar year  |                              |                                |                            |                              |
| 1997-2001  | 658,943 (32%)                | 245,102 (23%)                  | 77,171 (26%)               | 30,972 (19%)                 |
| 2002-2006  | 694,271 (34%)                | 289,565 (27%)                  | 117,356 (40%)              | 54,765 (34%)                 |
| 2007-2011  | 462,329 (22%)                | 256,093 (24%)                  | 75,987 (26%)               | 46,959 (29%)                 |
| 2012-2016  | 185,097 (9.0%)               | 194,355 (18%)                  | 18,053 (6.2%)              | 22,374 (14%)                 |
| 2017-2019  | 55,897 (2.7%)                | 92,469 (8.6%)                  | 2,883 (1.0%)               | 5,566 (3.5%)                 |
| Ethnicity  |                              |                                |                            |                              |
| White  | 1,746,817 (90%)              | 923,988 (91%)                  | 255,187 (95%)              | 141,487 (95%)                |
| South Asian  | 101,201 (5.2%)               | 45,262 (4.5%)                  | 6,959 (2.6%)               | 3,283 (2.2%)                 |
| Black  | 52,470 (2.7%)                | 25,626 (2.5%)                  | 2,951 (1.1%)               | 1,682 (1.1%)                 |
| Other  | 20,866 (1.1%)                | 10,269 (1.0%)                  | 2,744 (1.0%)               | 1,350 (0.9%)                 |
| Mixed  | 14,034 (0.7%)                | 7,447 (0.7%)                   | 1,080 (0.4%)               | 637 (0.4%)                   |
| Missing  | 121,149                      | 64,992                         | 22,529                     | 12,197                       |
| Below 10th percentile Carstairs Index                | 99,265 (4.8%)                | 59,340 (5.5%)                  | 11,139 (3.8%)              | 7,394 (4.6%)                 |
| BMI <sup>1</sup>                                     | 28 (24, 32)                  | 28 (24, 32)                    | 25.7 (22.7, 29.5)          | 26.1 (23.1, 29.7)            |
| Missing  | 375,309                      | 199,397                        | 30,884                     | 16,900                       |
| Current smoker                                       | 669,169 (33%)                | 337,182 (31%)                  | 91,894 (32%)               | 47,160 (29%)                 |
| Heavy drinker  | 47,340 (2.3%)                | 36,336 (3.4%)                  | 5,847 (2.0%)               | 4,678 (2.9%)                 |
| Number of GP appointments in prior 6m <sup>1,2</sup> | 1.0 (0.0, 5.0)               | 2.0 (0.0, 5.0)                 | 4.0 (2.0, 8.0)             | 5.0 (2.0, 9.0)               |
| Hospitalized in prior 6m                             | 374,199 (18%)                | 213,609 (20%)                  | 53,937 (19%)               | 32,535 (20%)                 |
| Statin in prior 6 months                             | 240,967 (12%)                | 154,578 (14%)                  | 35,651 (12%)               | 23,992 (15%)                 |
| Corticosteroid in prior 6 months                     | 117,259 (5.7%)               | 77,514 (7.2%)                  | 21,517 (7.4%)              | 15,271 (9.5%)                |
| Coronary heart disease                               | 177,028 (8.6%)               | 94,405 (8.8%)                  | 27,402 (9.4%)              | 15,110 (9.4%)                |
| Hypertension   | 440,438 (21%)                | 243,475 (23%)                  | 65,242 (22%)               | 37,887 (24%)                 |

| Characteristic              | Aurum                        |                                | GOLD                       |                              |
|-----------------------------|------------------------------|--------------------------------|----------------------------|------------------------------|
|                             | Cephalosporin, N = 2,056,537 | Fluoroquinolone, N = 1,077,584 | Cephalosporin, N = 291,450 | Fluoroquinolone, N = 160,636 |
| Diabetes                    | 152,140 (7.4%)               | 89,380 (8.3%)                  | 26,726 (9.2%)              | 16,134 (10%)                 |
| Uncontrolled diabetes       | 93,696 (4.6%)                | 57,910 (5.4%)                  | 12,651 (4.3%)              | 8,383 (5.2%)                 |
| Cerebrovascular disease     | 110,396 (5.4%)               | 54,326 (5.0%)                  | 16,286 (5.6%)              | 8,106 (5.0%)                 |
| Dementia                    | 42,638 (2.1%)                | 15,197 (1.4%)                  | 5,871 (2.0%)               | 1,961 (1.2%)                 |
| HIV                         | 1,541 (<0.1%)                | 1,783 (0.2%)                   | 128 (<0.1%)                | 120 (<0.1%)                  |
| Chronic liver disease       | 6,703 (0.3%)                 | 5,708 (0.5%)                   | 837 (0.3%)                 | 742 (0.5%)                   |
| Chronic kidney disease      | 250,855 (12%)                | 127,059 (12%)                  | 41,223 (14%)               | 22,318 (14%)                 |
| Peripheral vascular disease | 38,486 (1.9%)                | 23,113 (2.1%)                  | 6,520 (2.2%)               | 4,064 (2.5%)                 |
| Myocardial infarction       | 61,886 (3.0%)                | 34,520 (3.2%)                  | 9,583 (3.3%)               | 5,565 (3.5%)                 |
| Carotid artery disease      | 5,151 (0.3%)                 | 3,071 (0.3%)                   | 854 (0.3%)                 | 531 (0.3%)                   |
| Aortic aneurysm             | 4,140 (0.2%)                 | 2,547 (0.2%)                   | 609 (0.2%)                 | 379 (0.2%)                   |
| Multiple sclerosis          | 9,039 (0.4%)                 | 4,981 (0.5%)                   | 1,502 (0.5%)               | 822 (0.5%)                   |
| Rheumatoid arthritis        | 28,902 (1.4%)                | 12,818 (1.2%)                  | 6,444 (2.2%)               | 3,083 (1.9%)                 |

1. Median (interquartile range)
2. Ability to characterize primary care appointment type by type (i.e., primary care physician appointment versus other appointment) is limited in Aurum

# **CHAPTER 7. RESEARCH PAPER: ASSOCIATION BETWEEN SYSTEMIC FLUOROQUINOLONE USE AND RISK OF PERIPHERAL NEUROPATHY**

## **Overview**

In this chapter I present a drafted research paper on the association between fluoroquinolone prescribing and incidence of peripheral neuropathy. In this paper I use active comparators to reduce potential confounding and quantitative bias analysis to quantify the potential impact of an unmeasured confounder on study findings.

## RESEARCH PAPER COVER SHEET

Please note that a cover sheet must be completed for each research paper included within a thesis.

### SECTION A – Student Details

|                     |   |       |     |
|---------------------|---|-------|-----|
| Student ID Number   | 368990  | Title | Mr. |
| First Name(s)       | Jeremy Philip   |       |     |
| Surname/Family Name | Brown   |       |     |
| Thesis Title        | Application of methods for handling unmeasured confounding in pharmacoepidemiological studies |       |     |
| Primary Supervisor  | Professor Ian Douglas   |       |     |

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

### SECTION B – Paper already published

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| If the work was published prior to registration for your research degree, give a brief rationale for its inclusion |                 |   |                 |
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### SECTION C – Prepared for publication, but not yet published

|   |  |
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| Where is the work intended to be published?                       | JAMA Neurology or BMC Medicine   |
| Please list the paper's authors in the intended authorship order. | Jeremy P Brown; Kevin Wing; Clémence Leyrat; Stephen Evans; Kathryn E. Mansfield; Angel YS Wong; Liam Smeeth; Nicholas W Galwey; Ian J Douglas |
| Stage of publication  | Not yet submitted  |

**SECTION D – Multi-authored work**

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| <p>For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)</p> | <p>I designed the study with the guidance of colleagues, conducted all data analysis, and wrote all drafts of the manuscript</p> |
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## **Association between systemic fluoroquinolone use and risk of peripheral neuropathy**

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### **7.1 Abstract**

#### **Background**

Fluoroquinolone use has been associated with peripheral neuropathy in case reports, but there have been few non-interventional studies validating this association, and causality is unclear.

#### **Objectives**

To estimate the association between systemic fluoroquinolone use and incident peripheral neuropathy, using multiple databases to increase the precision and robustness of results.

#### **Methods**

Cohort studies were conducted separately in two databases of UK electronic primary care records, Clinical Practice Research Datalink Aurum and GOLD. Eligible adults prescribed a fluoroquinolone or a comparator class of antibiotic, cephalosporins, between 1<sup>st</sup> April 1997 and 31<sup>st</sup> December 2019 were selected. Hazard ratios were estimated between fluoroquinolone prescription and peripheral neuropathy within 60 days of prescription, using stabilised inverse probability of treatment weighted Cox regression. Risk differences were estimated with a weighted Kaplan-Meier estimator. Estimates were pooled across databases using fixed-effects meta-analysis.

#### **Results**

In total 2,933,969 individuals in Aurum and 994,010 in GOLD prescribed fluoroquinolones or cephalosporins were included. Of these individuals, at first treatment episode 1,000,921



(34.1%) in Aurum and 380,803 (38.3%) in GOLD were prescribed fluoroquinolones. There was weak evidence of an association between fluoroquinolones and peripheral neuropathy at first treatment episode (pooled adjusted hazard ratio [aHR] 1.15, 95% CI 0.99-1.33; p=0.07), and stronger evidence for an association over all treatment episodes (pooled aHR 1.21, 95% CI 1.11-1.32; p<0.001). Absolute risk differences per 100,000 treatment episodes were 2.71 (95% CI -0.87 to 6.32) at first treatment episode and 6.84 (95% CI 3.80 to 9.88) over all treatment episodes.

### **Conclusions**

We found some evidence for increased risk of peripheral neuropathy with fluoroquinolone use. However, the estimated increase in absolute and relative risk was small and could plausibly be explained by residual confounding.

## **7.2 Introduction**

Fluoroquinolones are a class of commonly prescribed broad-spectrum antibiotics. They are used to treat a range of infections including prostate, urinary tract, gastrointestinal, and respiratory infections.<sup>1</sup> There have been concerns around the safety of fluoroquinolones given adverse events reported in case reports and non-interventional studies.<sup>2-6</sup> Based on these findings, both the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) have recommended the addition of warnings to product labelling and restrictions on usage.<sup>7-11</sup>

It has been suggested that fluoroquinolone use may cause peripheral neuropathy. Case reports provided initial evidence for an association. Peripheral neuropathy was observed, often with rapid onset, following fluoroquinolone prescription.<sup>12,13</sup> A review of case reports by the FDA led the agency to require strengthened warnings to be added to fluoroquinolone packaging in 2013.<sup>14</sup> Two case-control studies and one cohort study have been conducted subsequently to estimate the association, all of which found increased risk of peripheral neuropathy with fluoroquinolone use.<sup>2,15,16</sup> However, it is uncertain to what extent associations observed may be due to underlying differences between comparator groups. For the two case-control studies, the primary comparison was with non-users of fluoroquinolones, who differ substantially from those prescribed fluoroquinolones including on infection status. The cohort study, which used a comparator group of patients prescribed one of several antibiotics found a much smaller association (adjusted HR 1.09, 95% CI 1.07-1.11), which may still be confounded by differences in prescribing between fluoroquinolones and the antibiotics studied (amoxicillin, azithromycin, co-amoxiclav, and cefixime).

The aim of this study was to estimate the relative and absolute risk of peripheral neuropathy with prescribing of systemic fluoroquinolones, relative to a comparator class of antibiotics, cephalosporins, using multiple study populations to increase the precision and robustness of results. Fluoroquinolones are compared to cephalosporins, rather than to non-use, because cephalosporins have not been linked to peripheral neuropathy, but are prescribed for similar indications to fluoroquinolones.<sup>17</sup> Hence their use as the comparator reduces potential confounding by indication.

## **7.3 Methods**

### **7.3.1 Data Sources**

Included individuals were selected from two databases of anonymised UK primary care records: Clinical Practice Research Datalink (CPRD) Aurum and GOLD.<sup>18,19</sup> These databases contain records of more than 20 million registered individuals from over a thousand primary care practices using two software systems (EMIS in Aurum, Vision in GOLD).<sup>20,21</sup> Both datasets have been used extensively for clinical and epidemiological research.<sup>22,23</sup> Primary care records from Aurum and GOLD were linked to socioeconomic deprivation data based on primary care practice postal code.<sup>24,25</sup>

### **7.3.2 Study design**

Cohort studies were conducted separately in Aurum and GOLD to estimate the association between fluoroquinolones and incidence of peripheral neuropathy within 60 days of prescription (see Appendix Figure 1 for a graphical description of the study design).<sup>26</sup>

### **7.3.3 Study eligibility**

We selected, in both Aurum and GOLD, adults aged  $\geq 18$  years with a systemic prescription for either a fluoroquinolone or the comparator class of antibiotic, cephalosporins, during the eligibility window. As noted in the introduction, this choice of comparator is intended to minimise the potential for confounding.

The eligibility window started at the latest of the following dates: 1<sup>st</sup> April 1997; one year after current registration of patient at practice; 18<sup>th</sup> birthday; or one year after practice data was deemed by the data provider to be of research quality (date available in GOLD only). The eligibility window ended at the earliest of 31<sup>st</sup> December 2019, patient transferred out of practice date, last data collection at practice, or death.

Individuals with the following prior conditions, strongly associated with peripheral neuropathy, were excluded: diabetes, human immunodeficiency virus (HIV), Charcot-Marie-Tooth, Lyme's disease, Sjogren's syndrome, systemic lupus erythematosus, and amyloidosis.<sup>27,28</sup> Severity of these conditions is poorly recorded in electronic health records and therefore restriction to those without these conditions is more suitable than statistical adjustment to reduce potential confounding. Individuals registered at primary care practices

present in both databases were excluded from the GOLD cohort. Only individuals at practices which could be linked to socioeconomic deprivation data were included.

#### **7.3.4 Outcomes**

The primary outcome was peripheral neuropathy identified by a medical code in Aurum or GOLD primary care records. We also included a positive-control outcome, tendon rupture. As there has been a long-recognised association between fluoroquinolones and tendon rupture we anticipated increased risk of tendon rupture with use of fluoroquinolones in this study.<sup>29</sup>

Clinical events are coded with Read codes in GOLD and with a mixture of Read, SNOMED and local EMIS codes in Aurum.<sup>18, 19</sup> Code lists for the outcomes, exposures and covariates can be found in the Appendix.

#### **Exposure**

Exposure was defined by a systemic prescription for fluoroquinolones (ciprofloxacin, levofloxacin, moxifloxacin, norfloxacin or ofloxacin) or cephalosporins.

Multiple treatment episodes, defined by prescriptions more than 60 days apart, were included separately. Treatment episodes were censored at the earliest of the following dates: peripheral neuropathy diagnosis; 60 days after prescription; patient prescription of alternative antibiotic (FQ or cephalosporin); 31<sup>st</sup> December 2019; patient transferred out of practice date; date of last data collection at practice; or death date. Only treatment episodes starting prior to first recorded peripheral neuropathy or tendon rupture were included.

### 7.3.5 Covariates

Potential confounders, specified in Box 1, were adjusted for, using methods detailed in the statistical analysis section.

#### **Box 1. Covariates adjusted for in cohort study**

- **Demographic and lifestyle variables:** age, sex, socioeconomic deprivation, body mass index (BMI), smoking status, alcohol consumption, ethnicity
- **Indicators of frailty and comorbidity in 6 months prior to baseline:** number of GP appointments
- **Ever prior comorbidities:** coronary heart disease, hypertension, cerebrovascular disease, dementia, chronic liver disease, chronic kidney disease, peripheral vascular disease, myocardial infarction, carotid disease, multiple sclerosis
- **Additional risk factors for peripheral neuropathy:** nitrofurantoin, phenytoin, or metronidazole use in last 6 months; ever previous Shingles, rheumatoid arthritis, or herpes simplex virus (HSV) type 1 infection
- **Additional risk factors for tendon rupture:** corticosteroid use in 6 months prior, ever prior rheumatoid arthritis

Socioeconomic deprivation was ascertained based on practice postal code using deciles of the Carstairs's Index, a measure of deprivation based upon male unemployment, car ownership, overcrowding, and socioeconomic class.<sup>30, 31</sup> The median number of GP appointments in GOLD and Aurum are not directly comparable due to differences in reporting of appointment type, but both should nevertheless be a marker of underlying comorbidity.

### 7.3.6 Statistical analysis

We adjusted for covariates through propensity score weighting using stabilised inverse probability of treatment weights.<sup>32</sup> The propensity score was modelled using multivariable logistic regression. Age was included in the model using a restricted cubic spline.

Individuals with no recorded alcohol consumption status were categorised as not heavy drinkers and with no recorded smoking status as not current smokers.<sup>33</sup> Missing values of ethnicity and BMI were imputed using multiple imputation with chained equations.<sup>34, 35</sup>

Treatment effect estimates in these cases were combined across 10 imputed datasets using Rubin's rules.<sup>36</sup> No imputation was performed when estimating the adjusted risk difference, and individuals with missing ethnicity or BMI were excluded from this analysis

Hazard ratios for peripheral neuropathy within 60 days of exposure were estimated using weighted Cox regression models with robust variance estimation. Proportionality was assessed using a test of Schoenfeld's residuals. Adjusted risk differences were estimated using a weighted Kaplan-Meier estimator.<sup>37, 38</sup> Estimates were pooled across databases using fixed-effects meta-analysis.

Data cleaning and management was performed in Stata 17, with statistical analyses conducted in R version 4.12.

### **7.3.7 Sensitivity analyses**

To assess the robustness of results the following sensitivity analyses were conducted: 1) limiting the cohort to adults with a suspected urinary tract infection (UTI) coded in their primary care record in the two weeks prior to treatment, to further minimise possible confounding by indication, 2) limiting the cohort to treatment episodes before 2013, i.e. prior to strengthened FDA warnings which might have influenced prescribing, 3) a complete-records approach where individuals with missing ethnicity or BMI were excluded, to assess sensitivity to missing-data assumptions 4) calculation of E-values and Cornfield conditions, to assess sensitivity of results to potential unmeasured confounding.

## **7.4 Results**

In the Aurum database we selected 2,933,969 individuals prescribed fluoroquinolones or cephalosporins (see Appendix Figure 2 for a study flow chart). At first treatment episode, 1,000,921 (34.1%) of these individuals were prescribed fluoroquinolones and 1,933,048 cephalosporins. Including treatment episodes subsequent to the first there were 2,030,151 treatment episodes of fluoroquinolones and 4,088,238 of cephalosporins.

In GOLD we selected 994,010 individuals prescribed fluoroquinolones or cephalosporins. At first treatment episode, 380,803 individuals (38.3%) were prescribed fluoroquinolones and 613,207 cephalosporins. Across all treatment episodes there were 755,855 treatment episodes of fluoroquinolones and 1,263,022 of cephalosporins.

Individual characteristics at first treatment episode were similar for fluoroquinolone users relative to cephalosporin users for most studied characteristics except sex (see Table 7.1). A lower proportion of those prescribed fluoroquinolones were female than of those prescribed cephalosporins (48.2% vs. 71.8% in Aurum – corresponding similar values for all descriptive statistics in GOLD are presented in Table 7.1). A greater proportion of fluoroquinolone users were prescribed treatment from 2012 onwards (25.8% vs. 11.1%). A slightly lower proportion of fluoroquinolone than cephalosporin users were current smokers (31.7% vs. 32.9%) or had dementia (1.2% vs. 1.98%). A slightly higher proportion of fluoroquinolone users were prescribed in individuals in the following categories: 6 months prior nitrofurantoin (4.1% vs. 3.1%) or corticosteroids (6.8% vs. 5.4%); heavy drinkers (3.4% vs. 2.3%); registered at a practice in an area of socioeconomic deprivation below the 10<sup>th</sup> percentile of the Carstairs' index (5.6% vs. 4.9%).

The pooled unadjusted hazard ratio between prescription of fluoroquinolones, relative to cephalosporin prescription, and peripheral neuropathy was 1.39 (95% CI 1.20-1.60;  $p < 0.001$ ) at first treatment episode and 1.39 (95% CI 1.28-1.51;  $p < 0.001$ ) over all treatment episodes. Adjustment for covariates reduced the hazard ratios towards the null. After adjustment for covariates, there was some weak evidence of an association between fluoroquinolones and peripheral neuropathy at first treatment episode (pooled adjusted hazard ratio [aHR] 1.15, 95% CI 0.99-1.33;  $p = 0.07$  – Figure 7.1), and stronger evidence of an association over all treatment episodes (pooled aHR 1.21, 95% CI 1.11-1.32;  $p < 0.001$  – Figure 7.2).

Strong evidence of an association with tendon rupture was observed, as anticipated, in Aurum and GOLD at first treatment episode (pooled aHR 2.17, 95% CI 1.71-2.74;  $p < 0.001$  – Figure 7.1) and all treatment episodes (pooled aHR 1.88, 1.63-2.17,  $p < 0.001$  – Figure 7.2). This finding was consistent in both Aurum and GOLD.

The estimated absolute difference in risk of peripheral neuropathy among fluoroquinolone relative to cephalosporin users was, adjusting for covariates, 2.72 per 100,000 (95% CI -0.87 to 6.32;  $p = 0.138$ ) at first treatment episode, and 11.14 per 100,000 (95% CI 8.14-14.15;  $p < 0.001$ ) over all treatment episodes (Table 7.2).

### **Secondary and sensitivity analyses**

In sensitivity analyses, findings were similar though estimated hazard ratios were slightly larger when restricting to individuals with a UTI, at first treatment episode (pooled aHR 1.34, 95% CI 0.92-1.97) and over all treatment episodes (1.49, 95% CI 1.23-1.80) (Appendix Tables 2 and 3). There was little difference in estimates when using a complete records approach, rather than multiple imputation, to handle missing BMI and ethnicity (Appendix Tables 4 and 5). Limiting to treatment episodes before the 2013 FDA warning had only minor effect on estimates (Appendix Tables 6 and 7).

For an unmeasured confounder to potentially account for the association observed over all treatment episodes, such that if the confounder were adjusted for the association would be null, the confounder would need to be associated with either fluoroquinolone prescription or peripheral neuropathy by at least risk ratio (RR) 1.71 (E-value for point estimate; E-value for CI lower bound 1.46) and with both of these exposures by at least RR 1.21 (Cornfield condition for point estimate; Cornfield condition for CI lower bound 1.11) – see Appendix Figure 3 for an E-value plot.<sup>39</sup>



## **7.5 Discussion**

In this study, we found some evidence of increased risk of peripheral neuropathy after treatment with a fluoroquinolone compared with a cephalosporin, with a 21% increased risk across all treatment episodes, corresponding to an absolute risk increase of 11 additional cases for each 100,000 treatment episodes.

However, the observed increase in relative risk was small, and could plausibly be explained by one or a few unmeasured or partially measured confounders of small magnitude.<sup>40</sup> Our sensitivity analyses could not rule out unmeasured confounding as an explanation. One potential unmeasured confounder is pre-diabetes, which is a known risk factor for peripheral neuropathy and can increase risk of infections but is not typically captured by routinely collected datasets.<sup>41, 42</sup>

Elevated risk of peripheral neuropathy associated with fluoroquinolone use has been observed in the three prior epidemiological studies conducted in adults.<sup>2, 15, 16</sup> Etminan and colleagues reported an elevated adjusted rate ratio (1.83, 95% CI 1.49-2.27) for current use compared to non-use in a nested case-control study.<sup>2</sup> Morales et al. reported an adjusted rate ratio of 1.47 (95% CI, 1.13-1.92) for current use versus non-use in a separate nested case-control study.<sup>15</sup> Ellis and colleagues reported an adjusted hazard ratio of 1.09 (95% CI 1.07-1.11) relative to comparator antibiotics (azithromycin, amoxicillin, co-amoxiclav, cefixime) for symptoms of peripheral nervous system dysfunction in a cohort study.<sup>16</sup>

Effect estimates are smaller in our study and in the cohort study by Ellis and colleagues than in the two previous case-control studies. One potential explanation is a difference in the primary comparator between studies, with Morales and Etminan both primarily comparing to non-users, rather than comparator antibiotic users, the former type of comparison being typically prone to greater residual confounding by indication.<sup>43</sup> Alternatively differing effect estimates could be due to chance or differences between study populations.

Initial evidence for an association came from spontaneous case reports.<sup>12, 13</sup> A review of US case reports in the FDA adverse events reporting system (FDAERS) reported between 1997 and 2012 found that there was a disproportionately high number of peripheral neuropathy cases relative to what would be expected.<sup>44</sup> The majority of cases did not have diabetes at peripheral neuropathy onset (98.0%, 528/539). Similar findings were reported in a study of

international cases in the VigiBase database.<sup>45</sup> The specific mechanism of any effect is uncertain.

There is limited evidence available from clinical trials, though a meta-analysis of randomised controlled trials did find an elevated risk of central nervous system related adverse events for fluoroquinolone relative to comparator antibiotics (pooled odds ratio 1.40, 95% CI 1.12-1.75), but did not specifically examine risk of peripheral neuropathy which limits relevance.<sup>46</sup>

Taking into consideration evidence from case reports, non-interventional studies, and trials there is evidence for an association, but it is not clear whether that association is causal, given small effect sizes and likely residual confounding. One or a few mismeasured confounders could have affected associations observed in both our and previous studies.

There are several major strengths of the present study. Consistency of findings across databases increases robustness of results and the use of two databases, by virtue of increased sample size, improves precision of estimates.

One limitation is the potential for misclassification of both exposure and outcome. There will likely be some outcome misclassification given that peripheral neuropathy is not acute and as such may not be reported immediately on presentation. However, bias due to outcome misclassification should be minimal given high specificity of the outcome definition and given that we do not anticipate outcome misclassification to be differentially related to the exposure.<sup>47</sup> With regard to misclassification of exposure, it should be noted that prescribing in secondary care is not captured in Aurum or GOLD. However, by comparing two antibiotics, we restricted the study population to those with a definite prescription. A lack of adherence with the prescribed antibiotics would be expected to bias our results towards no association, assuming adherence to be similar for fluoroquinolone and cephalosporin users. We excluded individuals at high risk of neuropathy to reduce confounding, but due to this restriction our findings may not generalise to these individuals.

In conclusion, the results of this study provide some evidence of an association between fluoroquinolones and peripheral neuropathy. However, the absolute and relative increase in risk is small and could possibly be explained by one or a few unmeasured or poorly measured confounders.

## **7.6 Acknowledgments**

This study is based in part on data from the Clinical Practice Research Datalink obtained under licence from the UK Medicines and Healthcare products Regulatory Agency. The data is provided by patients and collected by the NHS as part of their care and support. The interpretation and conclusions contained in this study are those of the author/s alone. The study was approved by the Independent Scientific Advisory Committee (protocol number: 20\_106RA). Ethics approval was granted by the LSHTM Research Ethics Committee (ref no 22592).

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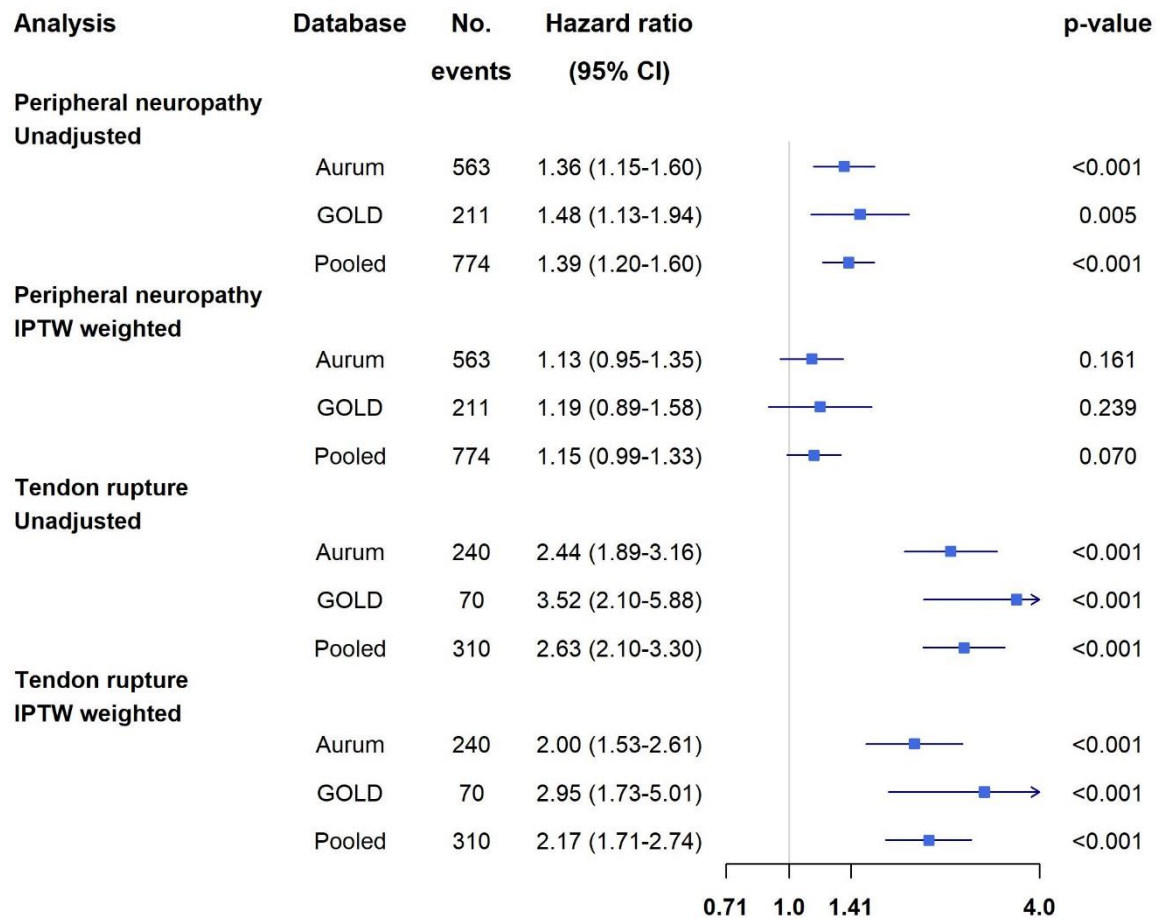
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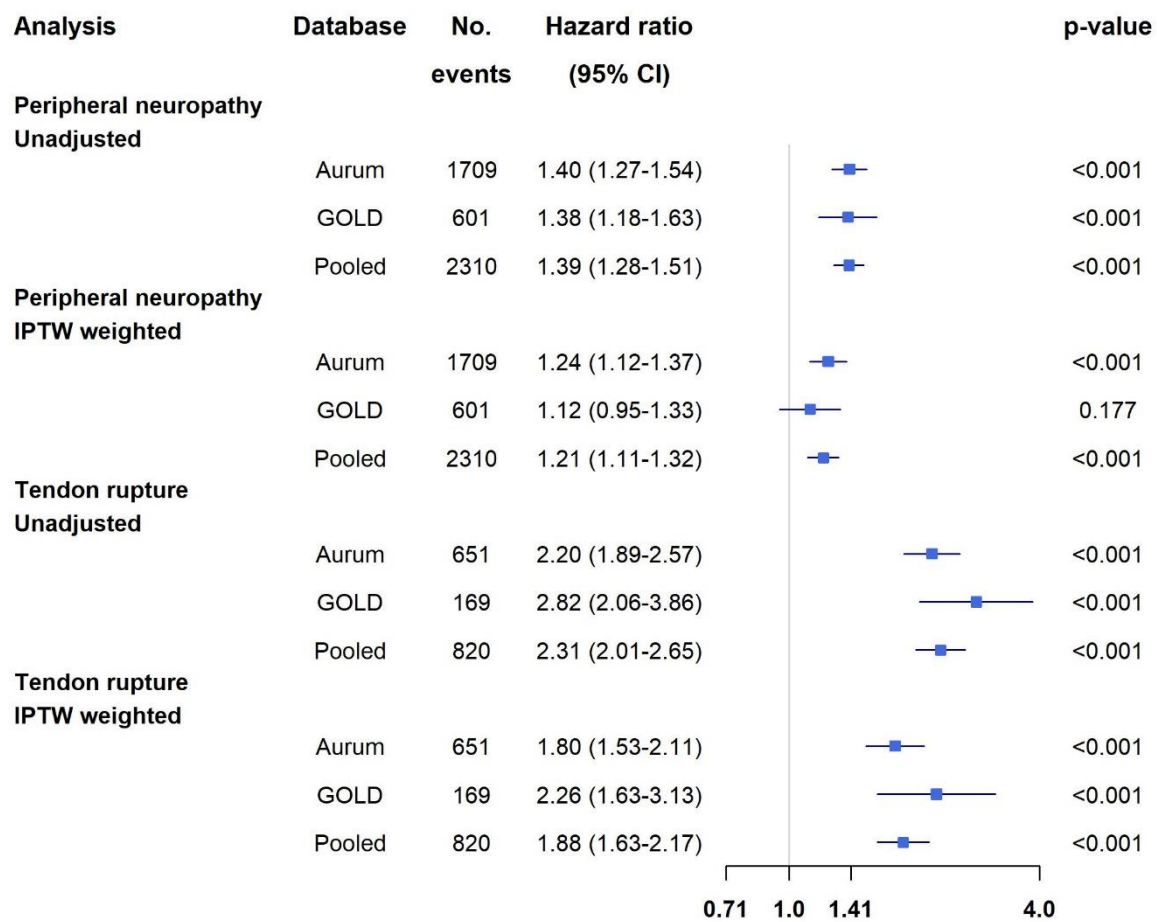
## 7.8 Figures



**Figure 7.1 Hazard ratios for association between fluoroquinolone use and peripheral neuropathy or tendon rupture at first treatment episode**

Definitions: CI, confidence interval; IPTW, inverse probability of treatment weight





**Figure 7.2 Hazard ratios for association between fluoroquinolones and peripheral neuropathy or tendon rupture at all treatment episodes**

Definitions: CI, confidence interval; IPTW, inverse probability of treatment weight

## 7.9 Tables

**Table 7.1 Baseline characteristics of fluoroquinolone users and cephalosporin users at first prescription**

| Characteristic                        | Aurum                        |                                | GOLD                       |                              |
|---------------------------------------|------------------------------|--------------------------------|----------------------------|------------------------------|
|                                       | Cephalosporin, N = 1,933,048 | Fluoroquinolone, N = 1,000,921 | Cephalosporin, N = 613,207 | Fluoroquinolone, N = 380,803 |
| Age, median (IQR)                     | 49 (33, 68)                  | 51 (36, 67)                    | 51 (34, 68)                | 52 (38, 67)                  |
| Female                                | 1,387,706 (71.8)             | 482,516 (48.2)                 | 446,232 (72.8)             | 185,287 (48.7)               |
| Calendar year                         |                              |                                |                            |                              |
| 1997-2001                             | 633,375 (32.8)               | 234,098 (23.4)                 | 126,238 (20.6)             | 51,109 (13.4)                |
| 2002-2006                             | 654,452 (33.9)               | 271,971 (27.2)                 | 246,880 (40.3)             | 121,521 (31.9)               |
| 2007-2011                             | 429,568 (22.2)               | 236,957 (23.7)                 | 180,427 (29.4)             | 117,734 (30.9)               |
| 2012-2016                             | 166,656 (8.6)                | 175,829 (17.6)                 | 48,906 (8.0)               | 65,514 (17.2)                |
| 2017-2019                             | 48,997 (2.5)                 | 82,066 (8.2)                   | 10,756 (1.8)               | 24,925 (6.5)                 |
| Ethnicity                             |                              |                                |                            |                              |
| White                                 | 1,632,066 (90.7)             | 854,578 (91.9)                 | 345,820 (95.4)             | 210,568 (96.1)               |
| South Asian                           | 88,176 (4.9)                 | 37,536 (4.0)                   | 7,948 (2.2)                | 3,861 (1.8)                  |
| Black                                 | 46,989 (2.6)                 | 21,959 (2.4)                   | 3,721 (1.0)                | 1,930 (0.9)                  |
| Other                                 | 19,660 (1.1)                 | 9,452 (1.0)                    | 3,476 (1.0)                | 1,969 (0.9)                  |
| Mixed                                 | 13,195 (0.7)                 | 6,861 (0.7)                    | 1,368 (0.4)                | 824 (0.4)                    |
| Missing                               | 132,962                      | 70,535                         | 250,874                    | 161,651                      |
| Below 10th percentile Carstairs Index | 95,540 (4.9)                 | 56,224 (5.6)                   | 23,161 (3.8)               | 18,178 (4.8)                 |
| BMI, median (IQR)                     | 27.3 (24.0, 31.5)            | 27.3 (24.2, 31.1)              | 25.7 (22.6, 29.5)          | 26.1 (23.1, 29.7)            |
| Missing                               | 351,663                      | 183,970                        | 67,889                     | 46,289                       |
| Current smoker                        | 636,763 (32.9)               | 317,015 (31.7)                 | 192,709 (31.4)             | 111,526 (29.3)               |
| Heavy drinker                         | 44,987 (2.3)                 | 34,369 (3.4)                   | 16,268 (2.7)               | 16,524 (4.3)                 |
| <b>Prior 6 months</b>                 |                              |                                |                            |                              |
| Number of GP appointments             | 1.0 (0.0, 4.0)               | 1.0 (0.0, 5.0)                 | 4.0 (1.0, 8.0)             | 4.0 (2.0, 8.0)               |
| Nitrofurantoin                        | 59,915 (3.1)                 | 40,910 (4.1)                   | 19,378 (3.2)               | 14,438 (3.8)                 |
| Phenytoin                             | 8,107 (0.4)                  | 2,995 (0.3)                    | 2,586 (0.4)                | 1,037 (0.3)                  |
| Metronidazole                         | 30,527 (1.6)                 | 18,962 (1.9)                   | 10,362 (1.7)               | 7,863 (2.1)                  |
| Corticosteroid                        | 104,160 (5.4)                | 68,117 (6.8)                   | 43,709 (7.1)               | 34,449 (9.0)                 |
| <b>Ever prior</b>                     |                              |                                |                            |                              |
| Coronary heart disease                | 140,217 (7.3)                | 73,069 (7.3)                   | 49,657 (8.1)               | 31,208 (8.2)                 |

| Characteristic              | Aurum                           |                                   | GOLD                          |                                 |
|-----------------------------|---------------------------------|-----------------------------------|-------------------------------|---------------------------------|
|                             | Cephalosporin,<br>N = 1,933,048 | Fluoroquinolone,<br>N = 1,000,921 | Cephalosporin,<br>N = 613,207 | Fluoroquinolone,<br>N = 380,803 |
| Hypertension                | 355,878 (18.4)                  | 192,908 (19.3)                    | 122,708 (20.0)                | 78,290 (20.6)                   |
| Cerebrovascular disease     | 90,319 (4.7)                    | 43,457 (4.3)                      | 29,478 (4.8)                  | 16,965 (4.5)                    |
| Dementia                    | 36,453 (1.9)                    | 12,488 (1.2)                      | 12,150 (2.0)                  | 4,950 (1.3)                     |
| Chronic liver disease       | 5,033 (0.3)                     | 4,188 (0.4)                       | 1,848 (0.3)                   | 1,824 (0.5)                     |
| Chronic kidney disease      | 195,624 (10.1)                  | 97,269 (9.7)                      | 66,370 (10.8)                 | 39,708 (10.4)                   |
| Peripheral vascular disease | 30,830 (1.6)                    | 18,197 (1.8)                      | 11,737 (1.9)                  | 8,200 (2.2)                     |
| Myocardial infarction       | 48,608 (2.5)                    | 26,543 (2.7)                      | 17,393 (2.8)                  | 12,107 (3.2)                    |
| Carotid artery disease      | 4,032 (0.2)                     | 2,319 (0.2)                       | 1,739 (0.3)                   | 1,175 (0.3)                     |
| Multiple sclerosis          | 8,342 (0.4)                     | 4,518 (0.5)                       | 3,192 (0.5)                   | 1,943 (0.5)                     |
| HSV1 infection              | 27,352 (1.4)                    | 13,341 (1.3)                      | 14,153 (2.3)                  | 7,339 (1.9)                     |
| Shingles                    | 69,373 (3.6)                    | 41,660 (4.2)                      | 29,464 (4.8)                  | 18,698 (4.9)                    |
| Rheumatoid arthritis        | 25,052 (1.3)                    | 10,854 (1.1)                      | 12,957 (2.1)                  | 6,477 (1.7)                     |

Definitions: BMI, body mass index; HSV1, herpes simplex virus 1; GP, general practitioner; IQR, interquartile range.

Note: Unless otherwise specified numbers represent counts, with corresponding percentages in brackets.

**Table 7.2 Risk difference (RD) estimated per 100,000 treatment episodes**

| Treatment episode | Analysis      | Aurum |            |         | GOLD  |             |         | Pooled |            |         |
|-------------------|---------------|-------|------------|---------|-------|-------------|---------|--------|------------|---------|
|                   |               | RD    | 95% CI     | p-value | RD    | 95% CI      | P-value | RD     | 95% CI     | P-value |
| First             | Unadjusted    | 6.32  | 2.32-10.32 | 0.002   | 9.89  | 1.23-18.55  | 0.025   | 6.95   | 3.32-10.57 | <0.001  |
|                   | IPTW weighted | 2.54  | -1.39-6.48 | 0.205   | 3.63  | -5.21-12.48 | 0.420   | 2.72   | -0.87-6.32 | 0.138   |
| All               | Unadjusted    | 10.75 | 7.44-14.06 | <0.001  | 13.00 | 5.84-20.15  | <0.001  | 11.14  | 8.14-14.15 | <0.001  |
|                   | IPTW weighted | 7.18  | 3.82-10.55 | <0.001  | 5.31  | -1.79-12.41 | 0.142   | 6.84   | 3.80-9.88  | <0.001  |

Definitions: RD, risk difference; IPTW, inverse probability of treatment weight.

# **CHAPTER 8. RESEARCH PAPER: ASSOCIATIONS BETWEEN SYSTEMIC FLUOROQUINOLONE USE AND RISK OF UVEITIS AND RETINAL DETACHMENT**

## **Overview**

In this chapter I present a drafted research paper on the associations between fluoroquinolone prescribing and incidence of uveitis and retinal detachment. In this paper I use active comparators and self-controlled studies to reduce bias due to unmeasured confounding.

## RESEARCH PAPER COVER SHEET

Please note that a cover sheet must be completed for each research paper included within a thesis.

### SECTION A – Student Details

|                     |   |       |     |
|---------------------|---|-------|-----|
| Student ID Number   | 368990  | Title | Mr. |
| First Name(s)       | Jeremy Philip   |       |     |
| Surname/Family Name | Brown   |       |     |
| Thesis Title        | Application of methods for handling unmeasured confounding in pharmacoepidemiological studies |       |     |
| Primary Supervisor  | Professor Ian Douglas   |       |     |

If the Research Paper has previously been published please complete Section B, if not please move to Section C.

### SECTION B – Paper already published

|  |                 |   |                 |
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### SECTION C – Prepared for publication, but not yet published

|   |   |
|---|---|
| Where is the work intended to be published?                       | JAMA Ophthalmology or BMC Medicine  |
| Please list the paper's authors in the intended authorship order. | Jeremy P Brown, Kevin Wing, Stephen Evans, Clémence Leyrat, Kathryn E. Mansfield, Liam Smeeth, Angel YS Wong, David Yorston, Nicholas W Galwey, Ian J Douglas |
| Stage of publication  | Not yet submitted   |

**SECTION D – Multi-authored work**

|   |  |
|---|--|
| <p>For multi-authored work, give full details of your role in the research included in the paper and in the preparation of the paper. (Attach a further sheet if necessary)</p> | <p>I designed the study with the guidance of colleagues, conducted all data analyses, and wrote all drafts of the manuscript</p> |
|---|--|

## **Associations between systemic fluoroquinolone use and risk of uveitis and retinal detachment**

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### **8.1 Abstract**

#### **Background**

Fluoroquinolone use has been associated with increased risk of both uveitis and retinal detachment in non-interventional studies, but findings have been conflicting and causality is unclear.

#### **Objectives**

To estimate the association between systemic fluoroquinolone prescribing and two ocular outcomes, acute uveitis and retinal detachment, using multiple study designs and multiple databases to increase the robustness of results.

#### **Methods**

Cohort and self-controlled case series studies were conducted separately in two UK databases of anonymised primary care records (Clinical Practice Research Datalink Aurum and GOLD), linked to hospital admissions and socioeconomic deprivation data. In the cohort studies eligible adults prescribed a fluoroquinolone or a comparator antibiotic, cephalosporin, between 1<sup>st</sup> April 1997 and 31<sup>st</sup> December 2019 were selected. Hazard ratios were estimated between fluoroquinolone prescription and both uveitis and retinal detachment using stabilised inverse probability of treatment weighted Cox regression. In self-controlled case series adults with uveitis or retinal detachment were included. Rate ratios (RR) were estimated comparing outcome rates in risk periods exposed to fluoroquinolones compared to baseline unexposed



time, using conditional Poisson regression. Estimates were pooled across databases using fixed-effects meta-analysis.

## **Results**

In total 3,001,256 individuals in Aurum and 434,754 in GOLD prescribed fluoroquinolones or cephalosporins were included in cohort studies. There was no evidence of an association between fluoroquinolone use, relative to cephalosporins, and uveitis at first treatment episode (pooled adjusted hazard ratio (aHR) 0.92; 95% CI 0.72-1.19) or all treatment episodes (pooled aHR 1.05, 95% CI 0.89-1.24); and similarly for retinal detachment at first (pooled aHR 1.42, 95% CI 0.81-2.50) or all treatment episodes (pooled aHR 1.22; 95% CI 0.87-1.71). In self-controlled case series there was little evidence for an association between fluoroquinolone use, relative to non-use, and uveitis (pooled adjusted rate ratio [(aRR) [95% CI]: days 1-29 of exposure 1.13 [0.97-1.31]; days 30-59 1.16 [1.00-1.34]; days 60+ 0.98 [0.74-1.31]) or retinal detachment (pooled aRR [95% CI]: days 1-29 1.15 [0.86-1.54]; days 30-59 0.94 [0.69-1.30]; days 60+ 1.03 [0.59-1.78]).

## **Conclusions**

These findings do not support a class-effect of fluoroquinolones on uveitis or retinal detachment. While we cannot rule out any effect of fluoroquinolones on these ocular outcomes, study results indicate any absolute increase in risk would be small and hence of limited clinical significance.

## **8.2 Introduction**

Fluoroquinolones are a class of widely prescribed broad-spectrum antibiotics used to treat a number of infections including urogenital, respiratory tract, and skin infections.<sup>1,2</sup> Safety concerns have arisen given adverse events observed among fluoroquinolone users in case reports and non-interventional studies.<sup>3-5</sup> Both the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) have, as a result of available evidence, advised restrictions on usage and the addition of warnings to product labelling.<sup>6-10</sup>

It has been suggested that oral fluoroquinolones may cause both acute uveitis and retinal detachment. Case reports of uveitis with the use of oral fluoroquinolones, particularly moxifloxacin, prompted investigators to conduct non-interventional studies investigating the association.<sup>11</sup> These studies produced conflicting findings with elevated risk observed in two case-control studies, but no increased risk in a cohort study.<sup>12-14</sup> There has been a long-recognised association between fluoroquinolones and tendon rupture, thought based on animal and lab studies to be mediated by the effect of fluoroquinolones on collagen<sup>5, 15, 16</sup> Given that collagen is an important component of the retina, and on the basis of case reports of retinal detachment with fluoroquinolone use, investigators conducted a non-interventional study, finding elevated risk of retinal detachment with oral fluoroquinolone use relative to non-use.<sup>15</sup> Subsequent non-interventional studies produced divergent results and came to conflicting conclusions with regard to presence and causality of the association.<sup>17</sup> Given the limited number of effective antibiotics available, and the requirement for multiple antibiotics in the face of increasing antimicrobial resistance, it is important to understand the safety profile of fluoroquinolones.

The aim of this study was to estimate the association between prescribing of systemic fluoroquinolones and two ocular outcomes, acute uveitis and retinal detachment, using multiple study populations and study designs for more robust triangulation of the possible effects.<sup>18</sup>

## **8.3 Methods**

### **8.3.1 Data Sources**

Included individuals were selected from two databases of anonymised routinely collected UK primary care records: Clinical Practice Research Datalink (CPRD) Aurum and GOLD.<sup>19, 20</sup> Together the two databases contain records of more than 10 million currently registered patients from over a thousand primary care practices using one of two software systems (EMIS in Aurum; Vision in GOLD).<sup>21, 22</sup> Both databases are broadly representative of the general population in terms of age and sex.<sup>19, 20</sup>

These primary care databases, Aurum and GOLD, were linked to secondary care hospital admissions in Hospital Episode Statistics Admitted Patient Care (HES APC) and to area-level deprivation data. HES APC contains the records of all hospital admissions funded by the National Health Service (NHS) in England.<sup>23</sup> Area-level deprivation data contain measures of socioeconomic deprivation based on patient and practice postal code.<sup>24</sup>

### **8.3.2 Study design**

Cohort and self-controlled case series (SCCS) studies were conducted separately in Aurum and GOLD to estimate the associations between fluoroquinolone use and both uveitis and retinal detachment.

The SCCS is a self-controlled design where the frequency of the outcome is compared, within individuals, during exposed time, relative to non-exposed time.<sup>25</sup> Unlike a cohort study, where it is necessary to adjust for all potential confounders, the SCCS eliminates, by design, confounding that is time-invariant over the study period, though not time-varying confounding. We adjusted in analyses for potential time-varying confounding by age and calendar time.

### **8.3.3 Study eligibility**

We selected, in both the SCCS and the cohort studies, adults aged 18 years or older who were eligible for linkage to hospital admission and socioeconomic deprivation data. Individuals from overlapping practices present in both Aurum and GOLD were removed from the GOLD dataset. Overlaps occur due to practices switching software system (e.g., from EMIS to Vision).

The eligibility window started at the latest of: 1<sup>st</sup> April 1997; one year after practice data deemed by CPRD to be of research quality (date provided in GOLD only); one year after current registration of patient at practice; and 18<sup>th</sup> birthday. The eligibility window ended at the earliest of: 31<sup>st</sup> December 2019; death; patient transferred out of practice; and date of last practice data collection.

#### **8.3.4 Exposure**

Systemic fluoroquinolone prescription (ciprofloxacin, levofloxacin, moxifloxacin, norfloxacin, or ofloxacin) was the exposure of interest. Comparator antibiotics were chosen that are prescribed for similar indications but have not been linked to uveitis or retinal detachment.<sup>26</sup> In the cohort studies the comparator was prescription of a systemic cephalosporin. In the SCCS the comparators were both non-use of fluoroquinolones and the active comparators<sup>27</sup>: prescription of systemic cephalosporin, trimethoprim or co-amoxiclav.. Prescriptions were identified from primary care records.

#### **8.3.5 Outcomes**

The primary outcomes were acute uveitis and retinal detachment identified in primary care or hospital admissions. The hypothesised mechanism of detachment associated with fluoroquinolone use is thought to affect rhegmatogenous rather than tractional or serous retinal detachment, so we excluded codes for non-rhegmatogenous detachments from our definition of retinal detachment.<sup>28, 29</sup> To increase specificity of the outcome definition for retinal detachment we required a clinical code followed by a subsequent surgical operation to treat retinal detachment (scleral buckle, pneumatic retinopexy or vitrectomy), recorded within 30 days. Tendon rupture was included in the cohort studies as a positive control outcome. We anticipate an association with tendon rupture given the long-recognised association between fluoroquinolone use and tendon rupture.<sup>5</sup> In order to limit the studies to incident outcomes, only first record of each outcome per person was included. Restricting SCCS to the first recorded outcome can introduce bias, but this bias should be minimal if the outcome is rare, as is the case here.<sup>30</sup>

#### **8.3.6 Cohort study**

In the cohort study we estimated the association between systemic fluoroquinolone use, relative to systemic cephalosporin use, and uveitis and retinal detachment within 60 days of prescription (Appendix Figure 1 for a graphical depiction of the study design<sup>31</sup>). Adults with

a prescription within the eligibility window for a systemic fluoroquinolone or cephalosporin were included.<sup>25</sup>

Individuals in the following categories were excluded: Marfan's or Stickler's syndrome, systemic conditions associated with retinal detachment; prior diabetic retinopathy, given the association between this condition and tractional retinal detachment; endophthalmitis or conditions predisposing to endophthalmitis (aphakia, ocular surgery, intravitreal injection, head or ocular injury) in the prior 90 days, given that oral fluoroquinolones may be used in the treatment of this condition, and the condition itself increases the risk of retinal detachment<sup>32, 33</sup>; and ever prior tuberculosis or Lyme's disease, as these bacterial infections are strongly associated with fluoroquinolone/cephalosporin prescribing and with both exudative retinal detachment and uveitis.

Multiple treatment episodes, defined by prescriptions occurring more than 60 days apart, were included separately. Treatment episodes were censored at the earliest of death, prescription of alternative antibiotic (fluoroquinolone or cephalosporin), outcome occurrence, and 60 days following prescription. Only treatment episodes starting prior to any recorded uveitis, retinal detachment, or tendon rupture code were included, to limit the cohort to incident events.

### **8.3.7 Covariates**

Potential confounders, specified in Box 1, were adjusted for in the cohort studies.

### **Box 1. Covariates adjusted for in cohort study**

- **Demographic and lifestyle variables:** age, sex, socioeconomic deprivation, body mass index (BMI), smoking status, alcohol consumption, ethnicity
- **Indicators of frailty and comorbidity in 6 months prior to baseline:** number of hospital admissions, number of GP appointments
- **Ever prior comorbidities:** coronary heart disease, hypertension, diabetes, uncontrolled diabetes, cerebrovascular disease, dementia, HIV, chronic liver disease, chronic kidney disease, peripheral vascular disease, myocardial infarction, carotid artery disease, multiple sclerosis
- **Additional risk factors for retinal detachment or uveitis:** ever prior glaucoma, cataract, HSV1 infection, posterior vitreous detachment,
- **Additional risk factors for tendon rupture:** corticosteroid use in 6 months prior, ever prior rheumatoid arthritis

Socioeconomic deprivation was defined based on practice postal code using deciles of the Carstairs's Index, a measure of deprivation based upon male unemployment, overcrowding, car ownership, and socioeconomic class.<sup>34, 35</sup>

In the SCCS the potential time-varying confounders calendar time (in 5-year categories) and age (in 1-year categories) were adjusted for in analysis.

Code lists for the exposures, outcomes, and covariates are available online in the appendix.

#### **8.3.8 Self-controlled case series**

Separate SCCS were conducted for uveitis and retinal detachment in Aurum and GOLD, to estimate the rate ratio for each outcome with systemic fluoroquinolone use, relative to non-use or to use of one of the following comparator antibiotics: cephalosporins, co-amoxiclav, and trimethoprim. Adults with a first occurrence of the outcome within the eligibility window were selected. The observation period between start and end of eligibility was categorised by exposure status.

Prescriptions occurring more than 60 days apart were categorised as separate treatment episodes. We subcategorised the treatment episode into the following exposure windows:

days 1-29, day 30-59, and days 60+ (Figure 8.1), with exposure windows starting at the day after first prescription and lasting for 60 days following final prescription within a treatment episode. Day 0 is separated from other exposure windows as timing of exposure and outcome are unclear on this day, and given we anticipate higher reporting of clinical events on this day due to the primary care appointment. We separated a 30-day pre-exposure period from baseline time to prevent bias from any short-term effect of the outcome on likelihood of prescribing.<sup>36</sup>

### **8.3.9 Statistical analysis**

Data management was performed using Stata 17, and statistical analyses were conducted in R version 4.12.

#### **Cohort studies**

In the cohort studies, propensity score weighting, using stabilised inverse probability of treatment weights, was used to adjust for covariates.<sup>37</sup> Propensity scores were estimated using a logistic regression model. The continuous covariates, age and BMI, were modelled using a restricted cubic spline.

The hazard ratios for retinal detachment and uveitis within 60 days of exposure were estimated using weighted Cox regression models with robust variance estimation. Schoenfeld's residuals were used to assess hazard proportionality. A weighted Kaplan-Meier estimator was used to estimate adjusted risk differences.<sup>38,39</sup> Estimates were pooled across databases using fixed-effects meta-analysis.

Missing BMI and ethnicity values were imputed using multiple imputation with chained equations with 10 imputed datasets, assuming a missingness at random mechanism.<sup>40,41</sup> Propensity scores and treatment effect were estimated in each imputed dataset, and combined using Rubin's rules.<sup>42</sup> Individuals without recorded alcohol consumption were defined as not heavy drinkers and those with no recorded smoking status as not current smokers.<sup>43</sup>

#### **Self-controlled case series**

In the SCCS conditional Poisson regression models, conditional on the individual and adjusted for age and calendar time, were fitted to estimate rate ratios between fluoroquinolone use and each outcome. Rate ratios relative to comparator antibiotics were estimated using the

simple ratio approach for active comparators in self-controlled studies.<sup>27</sup> Estimated rate ratios were pooled across databases using fixed-effect meta-analysis.

### **8.3.10 Sensitivity analyses**

In a sensitivity analysis, in both the cohort and the SCCS, the definition of uveitis was limited to exclude posterior or intermediate uveitis codes, given that case reports raised concern specifically in relation to anterior uveitis.<sup>12</sup> Additionally, the definition of retinal detachment was relaxed to include any relevant clinical code, regardless of the presence of a subsequent procedure.

Further sensitivity analyses were conducted in the cohort studies, namely we: 1) excluded individuals with subsequent cataract surgery within 30 days of prescription, to prevent the potential inclusion of patients with pre-existing cataracts, prescribed fluoroquinolones as prophylaxis prior to cataract surgery; 2) restricted to individuals with an indication for urinary tract infection within two weeks prior, to mitigate confounding by indication; 3) restricted to first prescription only (i.e. to new users); 4) excluded individuals with prior diabetes, to reduce the likelihood of inclusion of tractional retinal detachment; 5) restricted to oral antibiotic prescriptions; 6) restricted to the most commonly prescribed fluoroquinolone in UK, namely ciprofloxacin.



## **8.4 Results**

### **8.4.1 Cohort**

In the Aurum database we identified 3,001,256 adults prescribed fluoroquinolones or cephalosporins (Appendix Figure 2). Of these, at first treatment episode 1,027,341 (34.2%) were prescribed fluoroquinolones and 1,973,915 cephalosporins. Across all treatment episodes there were 2,131,292 (33.3%) treatment episodes of fluoroquinolones and 4,266,152 of cephalosporins.

In GOLD we identified 434,754 individuals prescribed fluoroquinolones or cephalosporins. At first treatment episode, 153,854 (35.4%) were prescribed fluoroquinolones and 280,900 cephalosporins. In total there were 309,349 (34.9%) treatment episodes of fluoroquinolones and 577,082 of cephalosporins.

Individual characteristics at first treatment episode are presented in Table 8.1 (Appendix Table 1 presents characteristics over all treatment episodes). Fluoroquinolone and cephalosporin users were similar with regard to most studied characteristics except sex. There was a lower proportion of female fluoroquinolone users than cephalosporin users (47.7% vs. 71.1% in Aurum - similar numbers in GOLD presented in Table 8.1). A slightly lower proportion of fluoroquinolone users than of cephalosporin users had dementia (1.6% vs. 2.2% in Aurum). A slightly higher proportion of fluoroquinolone users than of cephalosporin users were heavy drinkers (2.9% vs. 2.0% in Aurum), hospitalised in the 6 months prior (23.1% vs. 20.4% in Aurum), or had corticosteroid use in the prior 6 months (14.1% vs. 11.0% in Aurum). Most fluoroquinolone prescriptions were for ciprofloxacin (87.4% in Aurum and 87.1% in GOLD at first treatment episode – Appendix Tables 2 & 3) while the majority of prescriptions of cephalosporins were for cefalexin (72.5% in Aurum and 71.0% in GOLD at first treatment episode).

There was no evidence of an association at first treatment episode (Figure 8.2) between fluoroquinolone use, relative to cephalosporin use, and uveitis (pooled adjusted hazard ratio [aHR] 0.92, 95% CI 0.72-1.19) or retinal detachment (pooled aHR 1.42, 95% CI 0.81-2.50). Similarly, there was no evidence of an association across all treatment episodes (Figure 8.2) for uveitis (pooled aHR 1.05, 95% CI 0.89-1.24) or retinal detachment (pooled aHR 1.22, 95% CI 0.87-1.71). These findings were consistent across Aurum and GOLD.

As anticipated, there was strong evidence of an association of fluoroquinolone use, relative to cephalosporin use, with tendon rupture in both Aurum and GOLD at first treatment episode (pooled aHR 2.03, 95% CI 1.57-2.63) and all treatment episodes (pooled aHR 1.92, 95% CI 1.65-2.23) (Figure 8.2).

The pooled adjusted absolute difference in 60-day risk between cephalosporins and fluoroquinolones per 100,000 first-treatment episodes was -0.91 (95% CI -3.73 to 1.91) cases of uveitis and 0.76 (95% CI -0.48 to 2.01) retinal detachments (Table 8.2). Across all treatment episodes, the pooled adjusted 60-day risk difference per 100,000 treatment episodes was 0.58 (95% CI -1.29 to 2.45) uveitis cases and 0.52 (95% CI, -0.37 to 1.42) retinal detachments (Appendix Table 4).

#### **8.4.2 Self-controlled case series**

We identified and included the following numbers of cases: uveitis – 72,251 in Aurum and 8,301 in GOLD; retinal detachment – 23,395 in Aurum and 2,761 in GOLD. Median follow-up was 16.4 years in Aurum and 12.5 years in GOLD for uveitis cases, and 18.6 years in Aurum and 13.5 years in GOLD for retinal detachment cases.

There was little evidence for an association between fluoroquinolone use, relative to non-use, and uveitis (pooled adjusted rate ratio [aRR] for days 1-29 of exposure 1.13, 95% CI 0.97-1.31; days 30-59 aRR 1.16, 95% CI 1.00-1.34; days 60+ aRR 0.98, 95% CI 0.74-1.31), and no evidence for a harmful association with uveitis relative to either cephalosporins or co-amoxiclav (Figure 8.3). There was weak evidence of an association at days 30-59 relative to trimethoprim use (aRR 1.20; 95% CI 1.01-1.43), but this association was not consistent across exposure windows or comparators.

There was no evidence for an association between fluoroquinolone use and retinal detachment relative to non-use (pooled aRR days 1-29 1.15, 95% CI 0.86-1.54; days 30-59 aRR 0.94, 95% CI 0.69-1.30; days 60+ aRR 1.03, 95% CI 0.59-1.78), and no evidence for an association relative to either cephalosporins, co-amoxiclav, or trimethoprim (Figure 8.3).

#### **8.4.3 Sensitivity analyses**

Sensitivity analysis modifying the outcome definition had minimal impact on results of the cohort studies or SCCS (Appendix Figure 3 & 4). Other sensitivity analyses similarly had minimal impact on study results (Appendix Tables 5 to 15).

## **8.5 Discussion**

There was little evidence, after adjusting for covariates, for increased risk of uveitis or retinal detachment with fluoroquinolone use. These findings were consistent across two different study designs, cohort studies and SCCS, conducted in two separate clinical record databases, CPRD Aurum and GOLD.

While we cannot rule out a small increase in risk of uveitis or retinal detachment with fluoroquinolones, it is apparent from the estimated risk differences that any increase in absolute risk is likely minimal (<1 in 10,000 treatment episodes) and of questionable clinical significance.

Two previous nested case-control studies found increased risk of uveitis with fluoroquinolone use, relative to non-use.<sup>12-14</sup> However, a subsequent US cohort study comparing fluoroquinolone to beta-lactam use did not find evidence for an association after adjustment for covariates.<sup>14</sup> Individuals prescribed antibiotics are likely to differ considerably from non-users, not least due to the presence of an infection. These differences might explain the increased risk observed in these earlier case-control studies. Further evidence to support this argument is that in the US cohort study, fluoroquinolone use was also found to be associated with increased incidence of systemic diseases that are known to be associated with uveitis (e.g., sarcoidosis, systemic lupus erythematosus, inflammatory bowel disease).

One nested case-control study identified a large association for current fluoroquinolone use relative to non-use and retinal detachment (adjusted rate ratio 4.50, 95% CI 3.56-5.70).<sup>28</sup> However, this study was conducted in a selected population of adults attending ophthalmology clinics, thereby introducing the possibility of selection bias.<sup>44</sup> Furthermore, the analysis controlled for few covariates. Subsequent studies, including our own, found either no evidence for an association or evidence for an association of smaller magnitude (relative risk < 2).<sup>29, 45-55</sup> Individuals with conditions leading to elevated risk of retinal detachment, such as cataracts or diabetes, may be more likely to receive oral fluoroquinolones (e.g., for prophylaxis for cataract surgery or to treat diabetes-associated urinary tract infections), which may explain associations observed in some studies. There was evidence to support this argument in our cohort studies, where there was a crude association between fluoroquinolones and retinal detachment, but no evidence for an association after adjusting for covariates.

Our study had multiple strengths including the large population size and the use of two databases, two study designs, and multiple sensitivity analyses to increase the robustness of findings. Self-controlled studies inherently control for time-invariant covariates (e.g., myopia) by estimating within person effects. The cohort study design enabled the estimation of absolute risk of the outcome.

However, there were also study limitations. There is likely to be a degree of outcome misclassification. Some individuals identified as having a retinal detachment may have non-rhegmatogenous detachments. The inclusion of non-rhegmatogenous detachments was reduced by specifying surgical treatment, which is not typically used in the treatment of serous detachment, as an inclusion criterion, and by excluding people with diabetic retinopathy, as these individuals are prone to tractional detachment. Further sensitivity analysis, varying the outcome definition of uveitis and retinal detachment, and excluding individuals with diabetes, had minimal impact on estimates.

The majority of prescriptions for fluoroquinolone antibiotics were for ciprofloxacin, with few prescriptions for moxifloxacin, the fluoroquinolone antibiotic for which the strongest safety signals concerning uveitis from case reports and non-interventional studies have been observed.<sup>11</sup> While there was no evidence for an association with uveitis overall in the US cohort study, there was evidence for an association in the case of moxifloxacin, and furthermore the observed risk was greater with moxifloxacin, relative to other fluoroquinolones, in one of the nested case-control studies.<sup>13, 14</sup> While our study cannot rule out an effect of moxifloxacin, it does provide some reassurance against a class-wide effect. Moxifloxacin is prescribed differently to other fluoroquinolones, including more frequent prescribing for ocular indications because of its high ocular penetration following oral administration.<sup>56</sup> Non-interventional studies examining moxifloxacin safety need to account carefully for this potential confounding, given the potential for residual bias.

In conclusion, whilst prescribing of antibiotics should always aim to account for potential risks as well as benefits, taken together, our findings indicate that restrictions on usage of fluoroquinolones on the basis of uveitis or retinal detachment may be unwarranted.

## **8.6 Acknowledgments**

This study is based in part on data from the Clinical Practice Research Datalink obtained under licence from the UK Medicines and Healthcare products Regulatory Agency. The data is provided by patients and collected by the NHS as part of their care and support. The interpretation and conclusions contained in this study are those of the author/s alone. The study was approved by the Independent Scientific Advisory Committee (protocol number: 20\_106RA). Ethics approval was granted by the LSHTM Research Ethics Committee (ref no 22592).

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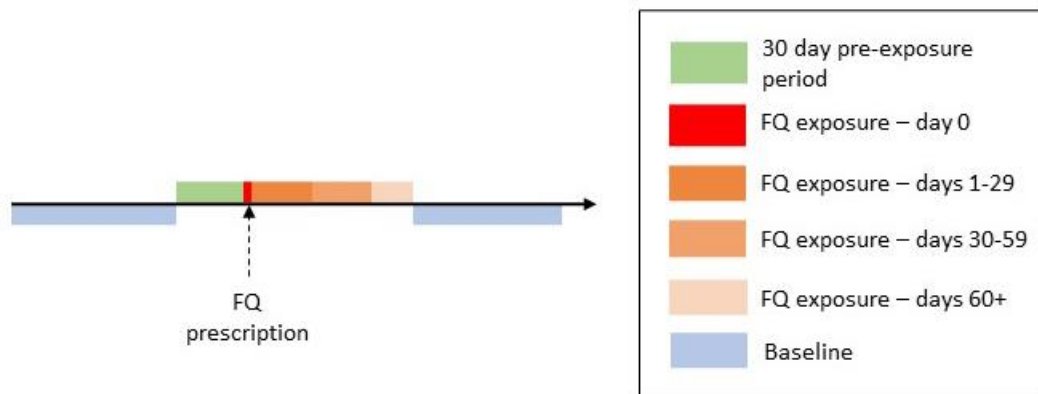
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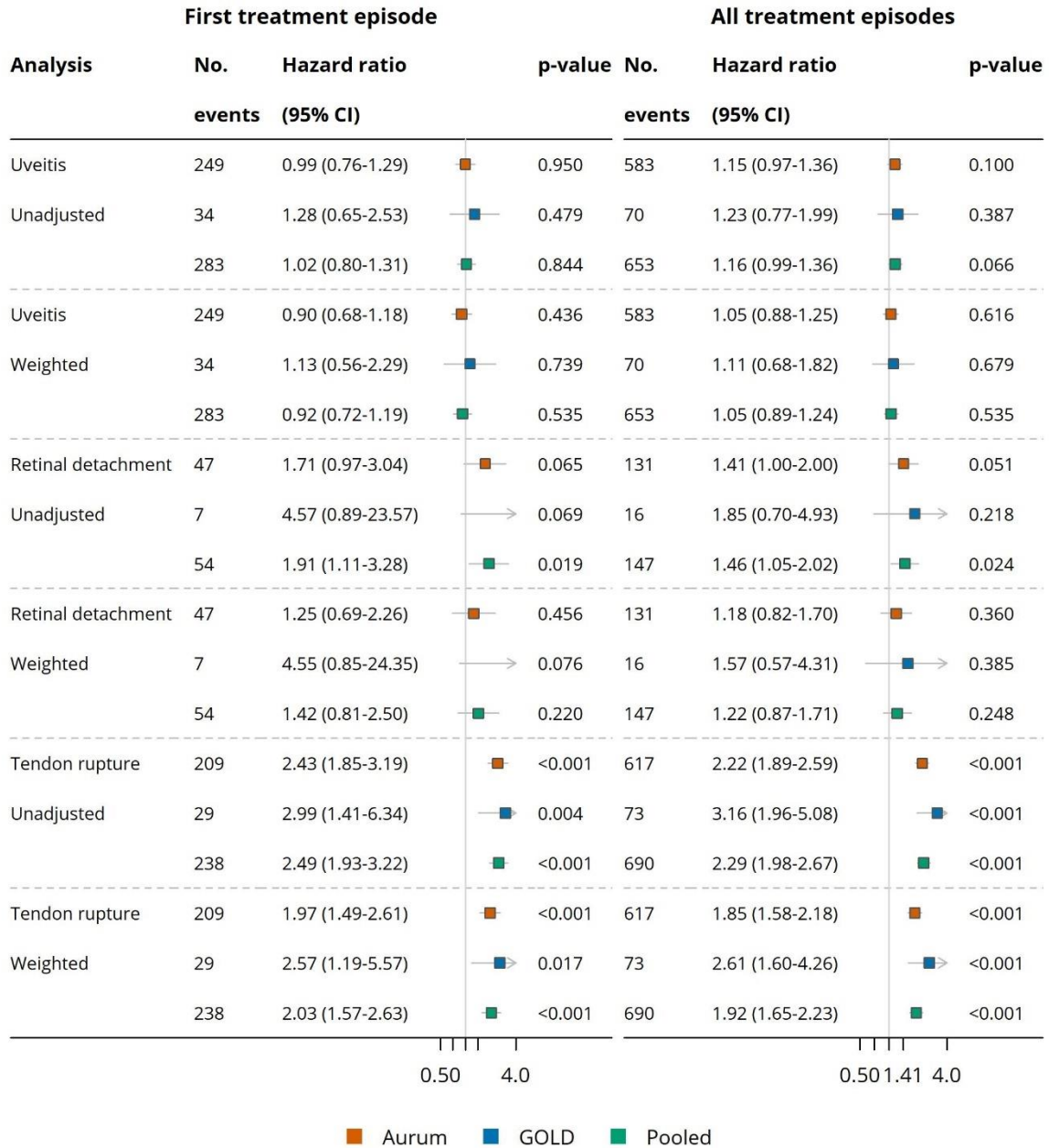
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## 8.8 Figures



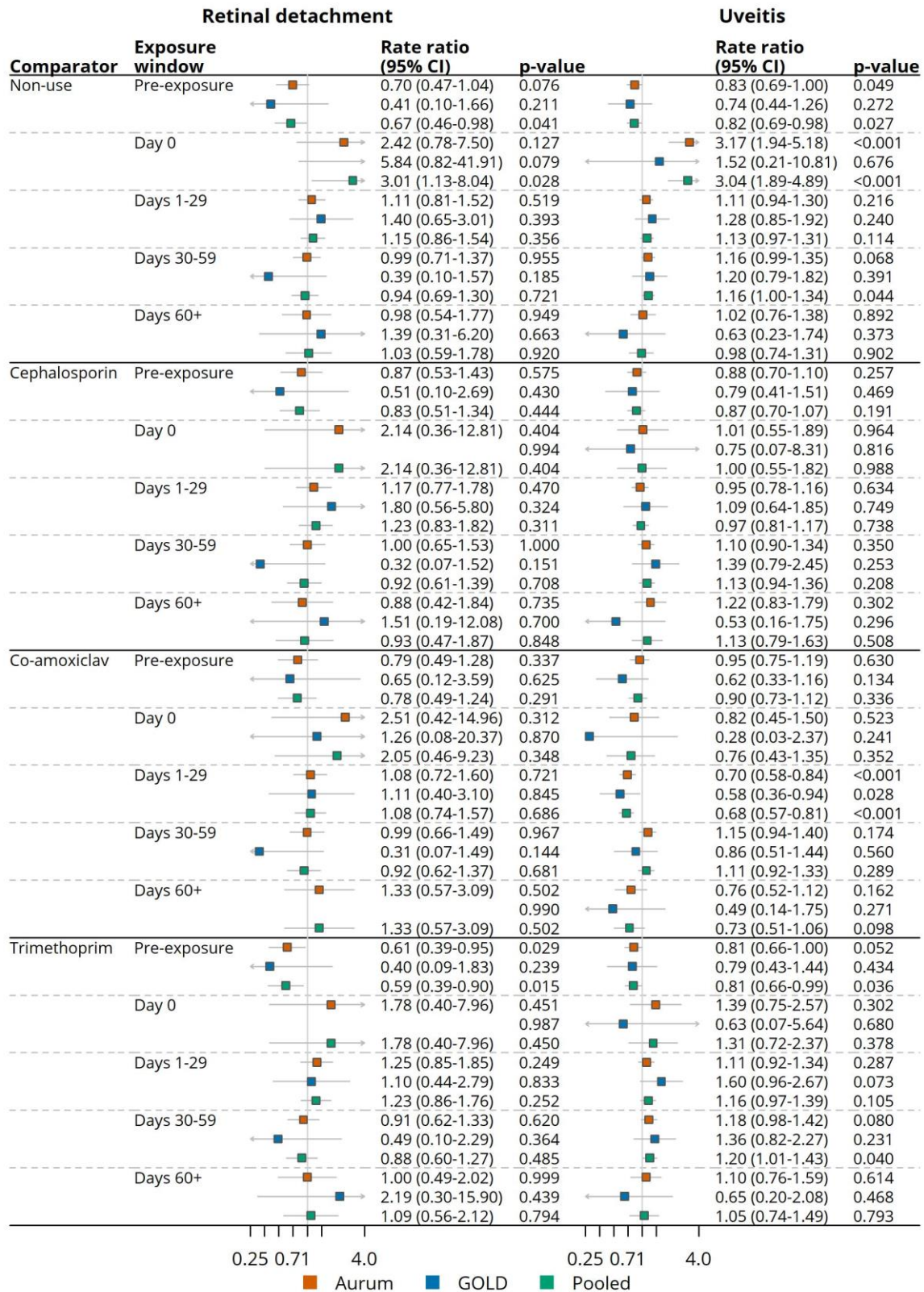
**Figure 8.1 Definition of exposure windows in SCCS**

Definitions: FQ, fluoroquinolone



**Figure 8.2 Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture following fluoroquinolone prescription, relative to cephalosporin prescription**

Definitions: CI, confidence interval



**Figure 8.3 Self-controlled case series - Rate ratios for uveitis and retinal detachment comparing fluoroquinolone use to non-use or to use of comparator antibiotics**

Definitions: CI, confidence interval.

## 8.9 Tables

**Table 8.1 Cohort studies - Baseline characteristics of fluoroquinolone and cephalosporin users at first treatment episode**

| Characteristic                           | Aurum                           |                                   | GOLD                          |                                 |
|--|---------------------------------|-----------------------------------|-------------------------------|---------------------------------|
|  | Cephalosporin, N<br>= 1,973,915 | Fluoroquinolone, N<br>= 1,027,341 | Cephalosporin, N<br>= 280,900 | Fluoroquinolone, N<br>= 153,854 |
| Age, median (IQR)                        | 50 (34, 69)                     | 52 (37, 68)                       | 53 (35, 70)                   | 54 (39, 69)                     |
| Female                                   | 1,403,191 (71.1)                | 490,370 (47.7)                    | 199,911 (71.2)                | 76,348 (49.6)                   |
| Calendar year                            |                                 |                                   |                               |                                 |
| 1997-2001                                | 640,472 (32.4)                  | 237,294 (23.1)                    | 74,556 (26.5)                 | 29,827 (19.4)                   |
| 2002-2006                                | 668,811 (33.9)                  | 278,322 (27.1)                    | 113,411 (40.4)                | 52,750 (34.3)                   |
| 2007-2011                                | 440,157 (22.3)                  | 243,405 (23.7)                    | 73,001 (26.0)                 | 44,769 (29.1)                   |
| 2012-2016                                | 172,802 (8.8)                   | 182,231 (17.7)                    | 17,180 (6.1)                  | 21,217 (13.8)                   |
| 2017-2019                                | 51,673 (2.6)                    | 86,089 (8.4)                      | 2,752 (1.0)                   | 5,291 (3.4)                     |
| Ethnicity                                |                                 |                                   |                               |                                 |
| White                                    | 1,680,597 (90.6)                | 883,403 (91.7)                    | 246,015 (95.0)                | 135,536 (95.5)                  |
| South Asian                              | 92,419 (5.0)                    | 40,166 (4.2)                      | 6,437 (2.5)                   | 2,961 (2.1)                     |
| Black                                    | 48,855 (2.6)                    | 23,311 (2.4)                      | 2,774 (1.1)                   | 1,541 (1.1)                     |
| Other                                    | 20,076 (1.1)                    | 9,750 (1.0)                       | 2,619 (1.0)                   | 1,275 (0.9)                     |
| Mixed                                    | 13,464 (0.7)                    | 7,064 (0.7)                       | 1,040 (0.4)                   | 612 (0.4)                       |
| Missing                                  | 118,504                         | 63,647                            | 22,015                        | 11,929                          |
| Below 10th percentile<br>Carstairs Index | 95,571 (4.8)                    | 56,777 (5.5)                      | 10,753 (3.8)                  | 7,179 (4.7)                     |
| BMI, median (IQR)                        | 27.5 (24.2, 31.8)               | 27.5 (24.3, 31.4)                 | 25.7 (22.7, 29.4)             | 26.0 (23.1, 29.7)               |
| Missing                                  | 360,885                         | 190,228                           | 30,094                        | 16,532                          |
| Current smoker                           | 647,063 (32.8)                  | 324,144 (31.6)                    | 89,351 (31.8)                 | 45,596 (29.6)                   |
| Heavy drinker                            | 45,668 (2.3)                    | 34,817 (3.4)                      | 5,671 (2.0)                   | 4,480 (2.9)                     |
| Prior 6 months                           |                                 |                                   |                               |                                 |
| Number of GP appointments                | 1.0 (0.0, 4.0)                  | 2.0 (0.0, 5.0)                    | 4.0 (2.0, 8.0)                | 5.0 (2.0, 9.0)                  |
| Hospitalised                             | 348,572 (17.7)                  | 196,013 (19.1)                    | 50,663 (18.0)                 | 30,147 (19.6)                   |
| Corticosteroid use                       | 138,116 (7.0)                   | 85,869 (8.4)                      | 24,543 (8.7)                  | 16,613 (10.8)                   |
| Ever prior                               |                                 |                                   |                               |                                 |
| Coronary heart disease                   | 161,295 (8.2)                   | 84,819 (8.3)                      | 25,510 (9.1)                  | 13,847 (9.0)                    |

| Characteristic                | Aurum                           |                                   | GOLD                          |                                 |
|-------------------------------|---------------------------------|-----------------------------------|-------------------------------|---------------------------------|
|                               | Cephalosporin, N<br>= 1,973,915 | Fluoroquinolone, N<br>= 1,027,341 | Cephalosporin, N<br>= 280,900 | Fluoroquinolone, N<br>= 153,854 |
| Hypertension                  | 402,367 (20.4)                  | 219,421 (21.4)                    | 60,823 (21.7)                 | 34,822 (22.6)                   |
| Diabetes                      | 120,111 (6.1)                   | 65,860 (6.4)                      | 32,563 (11.6)                 | 18,006 (11.7)                   |
| Uncontrolled diabetes         | 61,976 (3.1)                    | 35,710 (3.5)                      | 9,404 (3.3)                   | 5,856 (3.8)                     |
| Cerebrovascular disease       | 100,972 (5.1)                   | 48,986 (4.8)                      | 15,139 (5.4)                  | 7,428 (4.8)                     |
| Dementia                      | 39,360 (2.0)                    | 13,779 (1.3)                      | 5,559 (2.0)                   | 1,829 (1.2)                     |
| HIV                           | 1,402 (0.1)                     | 1,633 (0.2)                       | 121 (0.0)                     | 114 (0.1)                       |
| Chronic liver disease         | 6,082 (0.3)                     | 5,118 (0.5)                       | 775 (0.3)                     | 685 (0.4)                       |
| Chronic kidney disease        | 225,982 (11.4)                  | 113,033 (11.0)                    | 38,120 (13.6)                 | 20,331 (13.2)                   |
| Peripheral vascular disease   | 36,959 (1.9)                    | 22,247 (2.2)                      | 6,390 (2.3)                   | 3,862 (2.5)                     |
| Myocardial infarction         | 56,426 (2.9)                    | 31,012 (3.0)                      | 8,921 (3.2)                   | 5,127 (3.3)                     |
| Carotid artery disease        | 4,631 (0.2)                     | 2,726 (0.3)                       | 787 (0.3)                     | 481 (0.3)                       |
| Multiple sclerosis            | 8,679 (0.4)                     | 4,772 (0.5)                       | 1,452 (0.5)                   | 785 (0.5)                       |
| Cataract                      | 127,840 (6.5)                   | 64,078 (6.2)                      | 19,854 (7.1)                  | 10,415 (6.8)                    |
| Glaucoma                      | 36,292 (1.8)                    | 19,275 (1.9)                      | 6,041 (2.2)                   | 3,219 (2.1)                     |
| Posterior vitreous detachment | 11,273 (0.6)                    | 7,697 (0.7)                       | 1,692 (0.6)                   | 1,165 (0.8)                     |
| HSV1 infection                | 27,712 (1.4)                    | 13,550 (1.3)                      | 6,942 (2.5)                   | 3,398 (2.2)                     |
| Rheumatoid arthritis          | 26,804 (1.4)                    | 11,762 (1.1)                      | 6,059 (2.2)                   | 2,856 (1.9)                     |

Definitions: BMI, body mass index; GP, general practitioner; HSV1, herpes simplex virus 1; HIV, human immunodeficiency virus; IQR, interquartile range.

Main value in each table cell is number of patients, and value in brackets is percentage of individuals, except for age and BMI where median and interquartile range are presented.

**Table 8.2 Cohort studies - Risk differences between fluoroquinolone and cephalosporin users for uveitis, retinal detachment, and tendon rupture at first treatment episode**

| Outcome            | Analysis      | Aurum          |             |         | GOLD           |              |         | Pooled         |             |         |
|--------------------|---------------|----------------|-------------|---------|----------------|--------------|---------|----------------|-------------|---------|
|                    |               | RD per 100,000 | 95% CI      | p-value | RD per 100,000 | 95% CI       | p-value | RD per 100,000 | 95% CI      | p-value |
| Uveitis            | Unadjusted    | -0.10          | -3.10, 2.90 | 0.948   | 2.78           | -5.27, 10.84 | 0.498   | 0.25           | -2.56, 3.07 | 0.861   |
|                    | IPTW weighted | -1.22          | -4.23, 1.79 | 0.426   | 1.31           | -6.75, 9.38  | 0.749   | -0.91          | -3.73, 1.91 | 0.526   |
| Retinal detachment | Unadjusted    | 1.25           | -0.17, 2.67 | 0.086   | 3.58           | -0.68, 7.84  | 0.100   | 1.48           | 0.13, 2.83  | 0.031   |
|                    | IPTW weighted | 0.50           | -0.82, 1.81 | 0.460   | 2.97           | -0.81, 6.76  | 0.124   | 0.76           | -0.48, 2.01 | 0.229   |
| Tendon rupture     | Unadjusted    | 9.25           | 6.10, 12.41 | <0.001  | 11.09          | 2.75, 19.42  | 0.009   | 9.48           | 6.53, 12.43 | <0.001  |
|                    | IPTW weighted | 6.86           | 3.83, 9.90  | <0.001  | 8.86           | 1.07, 16.65  | 0.026   | 7.13           | 4.30, 9.95  | <0.001  |

Definitions: RD, risk difference; IPTW, inverse probability of treatment weighting; CI, confidence interval.



## CHAPTER 9. SUMMARY AND DISCUSSION

### Overview

In this chapter I summarise and discuss the results of the pharmacoepidemiological studies I conducted. I appraise the use and findings of methods to handle unmeasured confounding in these studies, and I assess what evidence there is for a causal effect of PPIs and fluoroquinolones on the studied outcomes.

The methods applied to diagnose, reduce, and quantify unmeasured confounding include negative control outcomes, a secondary comparator group, the high-dimensional propensity score, sensitivity analyses with varying time periods, quantitative bias analysis, and self-controlled studies with active comparators. I discuss what these methods can show and what they revealed in the studies I conducted investigating the safety of PPIs and fluoroquinolones.

Considering findings from these methods, I discuss the overall evidence for and against a causal association between PPIs, fluoroquinolones, and the outcomes under investigation.

I end the chapter with a discussion of the strengths and limitations of the conducted research, areas for future investigation, and overall conclusions of the project.

## **9.1 Summary of results**

In the earlier chapters of this thesis, I have presented, in a series of research papers, the results of studies estimating the associations between PPIs and mortality (Chapter 5) and between fluoroquinolones and uveitis, retinal detachment, hospitalisation with AA/AD, and peripheral neuropathy (Chapters 6-8). Here I will briefly summarise the findings from these studies.

### **9.1.1 PPIs and mortality**

In a cohort study of adults in GOLD, I found evidence for increased all-cause mortality among PPI users relative to both H2RA users (aHR 1.38, 95% CI 1.33-1.44) and matched non-users (aHR 1.96, 95% CI 1.94-1.99). Mortality was increased from communicable diseases (aHR 1.40, 95% CI 1.22-1.60) and from non-communicable diseases (aHR 1.39, 95% CI 1.35-1.45). Examining hazard ratios for cause-specific mortality, increased mortality was observed among PPI users relative to H2RA users for several causes, including neoplasms (aHR 1.74, 95% CI 1.63-1.86), cardiovascular or circulatory causes (aHR 1.43, 95% CI 1.20-1.69), chronic respiratory diseases (aHR 1.40, 95% CI 1.22-1.62), liver cirrhosis (aHR 1.95, 95% CI 1.10-3.46), and digestive causes other than cirrhosis (aHR 1.43, 95% CI 1.20-1.69).

### **9.1.2 Fluoroquinolones and risk of hospitalisation with AA/AD**

In cohort studies of adults in Aurum and GOLD, I found no evidence for increased risk of hospitalisation with AA/AD within 60 days of prescribing a fluoroquinolone compared with a cephalosporin, after adjustment for measured covariates (pooled aHR at first treatment episode 1.03, 95% CI 0.91-1.17; across all treatment episodes 1.02, 95% CI 0.94-1.11).

In case-crossover studies of adults in Aurum and GOLD hospitalised for AA/AD there was evidence of increased fluoroquinolone prescribing immediately prior to the outcome relative to an earlier reference period (pooled OR 1.58, 95% CI 1.37-1.83), but there was also evidence for increased risk with the other comparator antibiotics. Relative to these antibiotics, there was no evidence of an association between fluoroquinolones and AA/AD hospitalisation (pooled OR vs. cephalosporins 1.05, 95% CI 0.87-1.27; pooled OR vs. trimethoprim 0.89, 95% CI 0.75-1.06; pooled OR vs. co-amoxiclav 0.98, 95% CI 0.82-1.18).

### **9.1.3 Fluoroquinolones and risk of peripheral neuropathy**

In cohort studies in Aurum and GOLD I found weak evidence at first treatment episode for increased risk of peripheral neuropathy within 60 days of fluoroquinolone relative to cephalosporin prescription (pooled aHR 1.15, 95% CI 0.99-1.22). When considering all treatment episodes, not just the first, I found stronger evidence for an association (pooled aHR 1.21, 95% CI 1.11-1.32). However, the observed effect estimate was small and could potentially be explained by one or a few unmeasured or partially measured confounders. The estimated E-value (minimum RR for association between unmeasured confounder and either exposure or outcome required to potentially explain the observed association – see Section 1.2.3) was 1.71 for the point estimate and 1.46 for the lower bound of the effect estimate. Estimated absolute risk differences were small (pooled weighted risk difference per 100,000 at first treatment episode 2.72, 95% CI -0.87 to 6.32; over all treatment episodes 6.84, 95% CI 3.80 to 9.88).

### **9.1.4 Fluoroquinolones and risk of uveitis and retinal detachment**

In cohort studies of adults in Aurum and GOLD prescribed fluoroquinolones I found no evidence for increased risk relative to cephalosporin prescribing at first treatment episode of uveitis (pooled aHR 0.92, 95% CI 0.72-1.19) or retinal detachment (pooled aHR 1.42, 95% CI 0.81-2.50), and over all treatment episodes of uveitis (pooled aHR 1.05, 95% CI 0.98-1.24) or retinal detachment (pooled aHR 1.42, 95% CI 0.81-2.50). Estimated absolute differences in risk were small, with a pooled adjusted difference in 60-day risk per 100,000 individuals of -0.91 (95% CI -3.73 to 1.91) cases of uveitis and 0.52 (95% CI -0.37 to 1.42) cases of retinal detachment, at first treatment episode.

In self-controlled case series conducted in Aurum and GOLD there was little evidence for an association between fluoroquinolone use and uveitis or retinal detachment, either relative to non-use, or relative to use of comparator antibiotics. Relative to non-use, the pooled rate ratios for uveitis were at days 1-29 of exposure 1.13 (95% CI 0.97-1.31), at 30-59 days 1.16 (95% CI 1.00-1.34), and at 60+ days 0.98 (95% CI 0.74-1.31). For retinal detachment the pooled rate ratios relative to non-use were at 1-29 days 1.15 (95% CI 0.86-1.54), at 30-59 days 0.94 (95% CI 0.69-1.30), and at 60+ days 1.03 (95% CI 0.59-1.78).

### **9.1.5 Overall summary**

Overall, in cohort studies there was strong evidence for associations between PPI prescribing and both all-cause and cause-specific mortality, and some evidence for an association between fluoroquinolone prescribing and peripheral neuropathy.

There was little or no evidence, either in self-controlled studies or in cohort studies after covariate-adjustment, for associations between fluoroquinolone prescribing, relative to cephalosporin prescribing, and uveitis, retinal detachment, or AA/AD.

## **9.2 Approaches for handling unmeasured confounding**

### **9.2.1 Unmeasured confounding in the conducted studies**

In the background chapter of this thesis (Chapter 1), I provided an overview of unmeasured confounding, and I introduced two drug safety areas in which unmeasured confounding is a potential concern: PPIs prescribing and mortality, and fluoroquinolone prescribing and risk of uveitis, retinal detachment, AA/AD, and peripheral neuropathy.

For the study of PPIs and mortality (Chapter 5), unmeasured confounding in non-interventional studies was a concern due to potential non-causal relationships between the exposure and the outcome. PPIs are often given to patients who are unwell, for example to those who are critically unwell for the prevention or treatment of stress ulcers,<sup>1</sup> and as gastroprotection for patients prescribed NSAIDs, corticosteroids, or aspirin for other medical conditions.<sup>2</sup> A large number of medical conditions are associated with increased mortality and hence are potential confounders.<sup>3</sup> It is unclear whether previous epidemiological studies have included all potential confounders or have even been in a position to do so. When using routinely collected data, such as electronic health records or insurance claims data, we are limited to variables collected as part of routine practice.

For the investigation of fluoroquinolone safety (Chapters 6-8), unmeasured confounding was similarly a concern. Fluoroquinolones are prescribed for a wide range of infections, and often these infections are more common in patients with underlying health conditions associated with the medical conditions under investigation, such as diabetes.<sup>4-8</sup> Infection type and severity is poorly recorded in routinely collected healthcare data, and may potentially confound non-interventional studies of antibiotics. Unmeasured confounding due to infection status and severity is possible given limitations in the recording of infection status,

differences in prescribing between antibiotics, and associations of both infections, and risk factors for infections, with the studied outcomes.

In view of the potential for unmeasured confounding of these associations, I applied, in the studies conducted, methods to reduce, diagnose, and quantify potential unmeasured confounding.

### **9.2.2 Active comparators**

One of the simplest, and in practice most effective, methods to reduce confounding in pharmacoepidemiological studies, including confounding by potential unmeasured confounders, is to use an active comparator group.<sup>9</sup> An active comparator is typically chosen to be an alternative drug prescribed for the same indication as the primary product under investigation. By limiting the study population to users of drugs with the same indication, our aim is that the patient populations are similar to each other, and that after adjusting for measured covariates, all differences in the outcomes between the two populations relate only to the assigned drug (i.e. in the language of the causal inference literature, that the two populations are exchangeable<sup>10</sup>).

If we are interested in comparative effectiveness or safety, we can compare the drug of interest to another drug that we anticipate may also have a causal effect on the outcome, to determine whether the primary product is beneficial for safety or effectiveness.<sup>11</sup> However, when we want to measure safety or effectiveness relative to non-use (e.g. when the question of a causal relationship is unanswered) then it is preferable to choose comparators that we do not anticipate will causally affect the outcome. This latter approach is the one I used in the studies of PPIs (Chapter 5) and fluoroquinolones (Chapters 6-8). I did not anticipate that the active comparator to PPIs, namely H2RAs, or the active comparator to fluoroquinolones, namely cephalosporins, would causally affect the outcomes under investigation.

In the PPI study, I observed strong evidence of an association between prescribing of PPIs, relative to the active comparator H2RAs, and both all-cause mortality (aHR 1.38, 95% CI 1.33-1.44) and cause-specific mortality from communicable (aHR 1.40, 95% CI 1.22-1.60) and non-communicable (aHR 1.39, 95% CI 1.34-1.45) diseases. However, a concern in this study is that the active comparator population is not similar enough to PPI users, and hence that there may be unmeasured or otherwise uncontrolled residual confounding. It is

challenging to find an appropriate active comparator for many drugs, because even drugs used for the same indication are seldom prescribed completely interchangeably.

In the study of fluoroquinolones and AA/AD (Chapter 6), there was evidence for an association between fluoroquinolone prescription and AA/AD relative to non-use in the case-crossover study (pooled OR at first treatment episode 1.58, 95% CI 1.37-1.83), but there was no evidence of an association relative to comparator antibiotics. All antibiotics studied, covering three different classes of drug, were similarly associated with elevated risk of AA/AD. There was similarly no evidence of an association between fluoroquinolones relative to cephalosporins and AA/AD in the cohort study (pooled aHR 1.03, 95% CI 0.91-1.17) after adjustment for measured covariates. One explanation for these findings is that the infections for which these antibiotics are prescribed increase acute cardiovascular risk. This explanation is in accordance with other epidemiological studies that have found increased cardiovascular risk with respiratory tract infections.<sup>12</sup>

Previous studies investigating the association between fluoroquinolones and AA/AD found evidence of an association (Chapter 4). However, those studies typically used non-use, amoxicillin or azithromycin as comparators and it is not clear that these are valid comparators, given that there are major differences in their prescribing relative to fluoroquinolones.<sup>13</sup> For example, neither amoxicillin (without concomitant clavulanic acid – a combination known as co-amoxiclav) or azithromycin are typically prescribed for urinary tract infections in the UK, whereas this is one of the largest use cases for fluoroquinolones.<sup>14</sup> <sup>15</sup> Studies that used co-amoxiclav, cephalosporins, and combined trimethoprim with sulfamethoxazole, which are used more commonly for urinary tract infection, did not report an association. More generally, choosing an active comparator prescribed as similarly as possible to the drug of interest helps to reduce potential confounding.

### **9.2.3 Self-controlled studies**

Another approach applied to reduce unmeasured confounding is the use of self-controlled study designs. Self-controlled studies such as the case-crossover study<sup>16</sup>, and its extension the case-time-control study<sup>17, 18</sup>, and self-controlled case series<sup>19</sup> can handle unmeasured time-invariant confounding by design. In the case-crossover study, exposure occurrence is compared, within each case, in the period immediately prior to the outcome to some earlier reference period. In the self-controlled case series, the rate of outcome occurrence is compared, within each case, during periods of hypothesised high risk following drug

exposure, relative to non-exposed time. Comparisons are made within individuals, and therefore potential confounders that are time-invariant within an individual over the study duration (e.g., genetic factors) do not affect results. Choice of duration of follow-up is important given that some confounders (e.g., smoking, alcohol consumption, and BMI) will not change substantially over short time frames but may change considerably over longer time frames spanning years.

One limitation of standard self-controlled studies is that they do not typically account for confounders that vary over the study period, except for confounding by age or calendar time which can be readily incorporated into the conditional Poisson regression model.<sup>20</sup> While the analysis could adjust for other covariates, this can be technically challenging and can lead to problems as the analysis may then be conditioning on the effect of treatment itself. More recently, methodology for including active comparators within self-controlled studies has been developed, which may be used to reduce time-varying confounding.<sup>21</sup> Self-controlled studies are typically used to study transient exposures. Transient drug exposures may be prescribed for an acute clinical state (e.g., infection), which could lead to time-varying confounding by indication. Active comparators in self-controlled studies, prescribed for the same indication, can reduce this temporal confounding.

To study the association between fluoroquinolone-prescribing and hospitalisation with AA/AD (Chapter 6), I conducted such a case-crossover study with active comparators. Relative to non-use, an association was observed (pooled OR at first treatment episode 1.58, 95% CI 1.37-1.83), but relative to each of the active comparators there was no evidence of an association (pooled OR vs. cephalosporins 1.05, 95% CI 0.87-1.27; pooled OR vs. trimethoprim 0.89, 95% CI 0.75-1.06; pooled OR vs. co-amoxiclav 0.98, 95% CI 0.82-1.18). One possible explanation is that the observed association is not causal but is due to time-varying confounding by infection status. This finding highlights the limitations of conventional self-controlled studies, and the potential value of active comparators with this study design.

Self-controlled studies are only valid for particular types of exposure and outcome:<sup>22</sup> primarily, transient exposures that are anticipated to have only a short-term effect on an acute outcome. In my study of peripheral neuropathy (Chapter 7), no self-controlled studies were applied, because there may be a lag between development of peripheral neuropathy, and presentation and diagnosis at a primary care practice. Similarly, self-controlled studies were

not applied in my study of proton pump inhibitors, as the causal effect of these drugs was thought to be a potential long-term, rather than acute, effect.

#### **9.2.4 Secondary comparator groups**

One method that can be used to diagnose potential unmeasured confounding is a secondary comparator group. Secondary comparators can be valuable for diagnosing potential residual confounding that has not been controlled by design or through statistical analyses.<sup>23, 24</sup>

Assuming that neither comparator has a causal effect on the outcome, and that there is little heterogeneity of the treatment effect, we would expect similar effect estimates, after adjusting for potential confounders, when using different comparator groups. Hence differences between the effect estimates may indicate residual confounding.

In choosing the primary comparator group we will often seek to include individuals who are as similar as possible to those prescribed the drug of interest. As outlined in the section on active comparators, in pharmacoepidemiology we will often choose, as a comparator group, patients who have been prescribed a different drug for the same indication. For a secondary comparator group, it can be useful to choose a group in which residual confounding is expected to be severe, such as a non-use cohort. In this situation, we anticipate that if the primary comparison is biased due to unmeasured or partially measured confounders, then the secondary comparison will be even more confounded, and hence the effect estimate will be further from the null.

In the PPI study (Chapter 5), H2RA users were chosen as the primary comparator group because H2RAs are prescribed for the same indications as PPIs.<sup>25</sup> A secondary comparator group of non-users was chosen, in which it was anticipated that confounding would be more severe, given that both PPI and H2RA users are expected to be at higher risk of mortality than non-users as a result of underlying conditions prompting acid-suppression therapy.<sup>26</sup>

There was a considerable difference in effect estimates between comparator groups, as might be expected if adjustment for measured covariates had been unable to control all confounding. The adjusted hazard ratio for all-cause mortality for PPI use relative to non-use was 1.96 (95% CI 1.94-1.99), which was substantially higher than the hazard ratio relative to H2RA use (aHR 1.38, 95% CI 1.33-1.44). To ensure that in both comparisons I was estimating the same estimand, I applied weighted Cox regression using ‘average effect of



treatment in the treated' (ATT) weights<sup>27</sup>, which estimate the effect of treatment in the treated group (i.e. PPI users in this comparison).

It is possible that the primary comparison is unconfounded and is representative of the true causal association, but that due to differences in confounding between control groups, the secondary comparison remains confounded. However, it is also plausible, and perhaps even likely, that both comparisons are confounded. If we are unable to control for confounding in the non-user comparison, this reduces our confidence that we can control confounding, by adjusting for the same measured covariates, in the primary analysis.

### **9.2.5 Negative control outcomes**

Another approach which can be used to diagnose potential unmeasured confounding is the use of negative control outcomes. These are outcomes that we do not anticipate to be causally affected by exposure, but that we expect may be subject to similar confounding as our outcome of interest.<sup>28, 29</sup> If, after adjustment for measured confounders, an association between the exposure and the negative control outcome is observed, this may indicate that measured confounders are insufficient to control confounding of the association between exposure and the primary outcome. However, absence of an association with the negative control outcome does not necessarily indicate a lack of confounding of the primary association, given that the confounding structures may differ.

Negative control outcomes will only indicate residual confounding due to unmeasured confounders if the unmeasured confounders are associated similarly with the primary outcome and the negative control outcome. Therefore, it is important to choose the negative control outcome carefully.

In the cohort study that I conducted investigating the association between PPIs and mortality (Chapter 5), mortality from pulmonary embolism was chosen as a negative control outcome. Individuals in poorer health for a number of reasons (such as heart disease, hypertension and cancer) are at higher risk of pulmonary embolism.<sup>30</sup> These comorbidities may be confounders of the association between PPI prescribing and both mortality from pulmonary embolism, and mortality from other causes. There is no evidence to suggest a causal link between PPIs and pulmonary embolism mortality, which makes it suitable as a negative control outcome.

In this study the adjusted hazard ratio for mortality from pulmonary embolism was 1.33 (95% CI 0.85-2.09). Thus, there was no evidence of an association between PPI prescribing and

this outcome. However, in view of the wide confidence interval, this finding does not provide reassurance that unmeasured confounding is absent. For the negative control outcome to have been more useful here, we would have needed greater precision. This conclusion illustrates that it is advisable to conduct power calculations for all negative control outcomes.

One challenge in the choice of a negative control outcome is that good negative control outcomes will be subject to similar confounding as the primary outcome. Hence, especially if the literature is extensive, there may already be non-interventional studies reporting, and potentially suggesting as causal, an association due to confounding between the exposure and the candidate negative control outcome. If an association has already been reported and suggested to be potentially causal, then the outcome cannot be used as a negative control. For instance, inflammatory bowel disease might be considered a potential negative control outcome for the fluoroquinolone-uveitis association. Both uveitis and inflammatory bowel disease may be subject to similar confounding by infection, as both can be immune-mediated and hence may be triggered by the infection for which a fluoroquinolone is prescribed.<sup>31,32</sup> However, associations have been reported between fluoroquinolone prescribing and inflammatory bowel disease in the literature, precluding its use as a negative control outcome.<sup>33</sup>

### **9.2.6 High-dimensional propensity score**

To diagnose potential unmeasured confounding, we can use a high-dimensional propensity score. This is an algorithmic approach for deriving a large number (i.e. hundreds) of covariates from codes within routinely collected data, for inclusion in a propensity score model.<sup>34</sup> The most prevalent codes that are most strongly associated with both exposure and outcome are selected. It is thought that these codes may pick up additional confounding that is not captured by measured covariates, for instance that selected codes may be unmeasured confounders or proxies of unmeasured confounders. This method was developed in insurance claims data, but has since been applied to UK electronic health records.<sup>35</sup>

In the PPI study (Chapter 5), as a secondary analysis, a high-dimensional propensity score, including both investigator-chosen and algorithmically derived covariates, was used to weight hazard ratios comparing PPI to H2RA use. The high-dimensional propensity score weighted estimate was closer to the null (aHR 1.31, 95% CI 1.26-1.37) than the estimate based on investigator-chosen covariates only (aHR 1.38; 95% CI 1.33-1.44), but there was still strong evidence of an association.

The reduction in effect estimates towards the null with high-dimensional propensity score adjustment may be due to residual confounding in the primary analysis using investigator-specified covariates. However, the high-dimensional propensity score itself provides no guarantee to control all unmeasured confounding. It may be that unmeasured confounders are not captured in the routinely collected data, or that the algorithm does not effectively capture these. Therefore, we cannot be confident that the high-dimensional propensity score estimate reflects the true causal association. This finding does indicate, however, that residual confounding is a concern for the investigator-specified propensity score analysis.

### **9.2.7 Sensitivity analysis of time periods**

To diagnose potential unmeasured confounding, when investigating possible causal effects, we can use sensitivity analyses varying the study follow-up time.

We will often anticipate that a causal effect occurs over a specified time span. For example, for some diseases we do not anticipate a short-term causal effect of exposure on incidence of the outcome, and therefore any short-term association that we do observe may be due to residual confounding.

In the PPI study (Chapter 5), I specified as a sensitivity analysis an observation period of 6 months following treatment initiation. I then estimated mortality, within this period, from causes which I would not expect to develop from initiation to an extent which affects prognosis in such a short time, including dementia and Alzheimer's disease<sup>36</sup>; mesothelioma<sup>37</sup>; and lung, liver, breast and prostate cancer<sup>38-41</sup>. All-cause mortality was elevated within 6 months of prescription (aHR 1.34, 95% CI 1.25-1.43), as was mortality from lung cancer (aHR 1.77, 95% CI 1.39-2.25), breast cancer (aHR 2.43, 95% CI 1.75-3.36), and liver cancer (aHR 2.47, 95% CI 1.08-5.63), but there was not strong evidence of an association within 6 months with mesothelioma (aHR 1.54, 95% CI 0.87-2.73) or with dementia and Alzheimer's disease (aHR 1.03, 95% CI 0.60-1.77).

I would not expect that these malignancies could develop and affect mortality within 6 months of PPI initiation based on knowledge of lead times (time between screen detection and usual clinical presentation and diagnosis) of lung cancer, breast cancer and liver cancer estimated from screening studies<sup>38, 40, 41</sup>

Aside from chance, there are two potential explanations for these observed elevated hazard ratios at 6 months: 1) residual confounding leading to the observed associations with cancer-

specific mortality, 2) PPIs causally increase mortality of patients with these conditions. Though we cannot rule out the latter causal explanation for findings, we equally cannot rule out that our findings are due to unmeasured confounding. If the outcome of the study had been cancer incidence, rather than mortality, we would have been even more confident that any observed short-term association was due to residual confounding.

It is more challenging to apply this type of sensitivity analysis when we expect a short term, but not a long-term, effect of a drug. While we can estimate period-specific risk (e.g. risk within the following 3 months for those who survived without the outcome for 12 months), these estimates may be biased by depletion of susceptibles.<sup>42, 43</sup> Individuals susceptible to disease may develop it sooner in the treatment group, and later in the comparator group, with the resulting potential for a treatment that causes the disease to appear protective when follow-up is started later than treatment initiation. Furthermore, we may not be able to detect time-varying confounding with these estimates. For example, the association between uveitis and fluoroquinolones observed in previous studies might be immune-mediated and hence caused by the underlying infection for which fluoroquinolones were prescribed.<sup>13</sup> In this situation we might anticipate short-term unmeasured confounding by the type and severity of the underlying infection, but not anticipate longer-term confounding of the effect, post-infection.

### **9.2.8 Quantitative bias analyses**

To quantify potential bias due to unmeasured confounding I applied quantitative bias analysis methods. As outlined in Chapters 1 and 4, these are methods for quantitatively assessing the sensitivity of observed results to potential bias including unmeasured confounding. Broadly, quantitative bias analyses can be classified into methods to estimate the bias given assumptions about the unmeasured confounding, and methods to bound the potential bias.<sup>44-46</sup>

One of the bounding methods is the E-value, which represents the minimum strength of association that either the exposure-confounder or the confounder-outcome association must satisfy to potentially account for the observed association: that is, the confounder-outcome association required so that if the confounder was adjusted for, the observed exposure-outcome association could potentially be reduced to the null or to some other specified level.<sup>45, 47</sup> If the unmeasured confounder is more weakly associated with both exposure and outcome than the E-value, then that particular unmeasured confounder could not by itself

reduce the observed association to the null (or to another specified value). To calculate the E-value, all we need is the observed effect estimate.

While the E-value is simple to implement, it has important limitations. Even if the E-value is small, we cannot say that an unmeasured confounder of given strength of association with exposure and outcome would necessarily explain our observed estimate, only that it potentially could. The true extent of confounding would depend on the prevalence of the unmeasured confounder, which is not specified in the calculation of the E-value. While E-values have been very popular, they have often been applied with little thought given to the underlying unmeasured confounders, and have been frequently misinterpreted, which has led to criticism of their use.<sup>48-51</sup> E-values can be applied for multiple unmeasured confounders, but are challenging to interpret in this setting.

In the PPI and mortality study (Chapter 5), I calculated the E-value for the association between PPI prescribing and all-cause mortality relative to H2RA use (aHR 1.38, 95% CI 1.33-1.44). To potentially explain the lower bound of the E-value confidence interval (i.e., 1.33), at least one of the confounder-outcome and exposure-confounder associations, conditional on measured covariates, must be greater than a risk ratio of 1.99, and both of these associations must be greater than a risk ratio of 1.33. I could not, based on these findings, rule out unmeasured confounding as a potential explanation for the observed association. PPI users may be less healthy than H2RA users for several reasons, and this difference in frailty and comorbidity may be difficult or impossible to fully capture using routinely collected data. In previous studies, frailty has been associated with mortality with risk ratios above 2 (i.e. above the E-value).<sup>52</sup> There may be multiple unmeasured or poorly measured confounders, which could confound the association.

Separate to my main thesis, but reflecting my wider interest in quantitative bias analysis, I contributed quantitative bias analysis to two rapidly conducted COVID-19 pharmacoepidemiological studies conducted by colleagues using OpenSafely.<sup>53, 54</sup> These studies have not featured so far in my thesis as they were primarily conducted by colleagues, with only the quantitative bias analysis conducted by me. However, they demonstrate the utility of quantitative bias analysis as an approach for quantifying the potential impact of unmeasured confounding, and for this reason I will discuss them here.

In one study estimating the association between the ongoing, routine use of inhaled corticosteroids and COVID-19 death, I applied E-values. This study found increased risk of

COVID-19 deaths for people with COPD-prescribed inhaled corticosteroids, relative to long-acting  $\beta$  agonist plus long-acting muscarinic antagonist (LABA–LAMA) combinations (aHR 1.39, 95% CI 1.10-1.76).<sup>53</sup> Unmeasured confounding by disease severity was considered likely given that COPD exacerbation history could not be fully ascertained without secondary care data, which was unavailable. Furthermore, other markers of severity, such as use of home oxygen therapy use, are not recorded in the routinely collected primary care data used (OpenSafely). In this study I could not rule out unmeasured confounding due to disease severity based on the E-value (E-value for lower bound of CI 1.43) given possible unmeasured confounding by disease severity.

While the E-value can be used to rule out unmeasured confounding from one or more confounders as an explanation for findings, it cannot be used to calculate a bias-adjusted estimate, unlike bias formulas and probabilistic bias analysis.<sup>46,55</sup> Such estimates require additional information and assumptions, namely the prevalence of the unmeasured confounder in the exposure groups, and the association between the unmeasured confounder and the outcome. For unknown parameters relating to the unmeasured confounder (i.e., prevalence and association with outcome) we specify a single value or range of values (bias formulas), or a distribution of values (probabilistic bias analysis).

In a second COVID-19 pharmacoepidemiological study, carried out by colleagues investigating the association between routine, ongoing use of hydroxychloroquine and COVID-19 mortality among individuals with rheumatoid arthritis or systemic lupus erythematosus, I conducted quantitative bias analyses using bias formulas.<sup>54</sup> In this study, after adjustment there was no association between hydroxychloroquine use and COVID-19 mortality (HR 1.03, 95% CI 0.80-1.33). Use of biologics was hypothesised to be a potential unmeasured confounder, which may hide a true protective association (i.e., bias a truly protective association towards the null). Biologics may affect COVID-19 mortality and are an alternative treatment to hydroxychloroquine. However, they are prescribed in secondary care, and secondary care prescribing data was at the time unavailable in the dataset used (OpenSAFELY). Estimates of prevalence of biologic use among hydroxychloroquine users and non-users were obtained from the literature, and a range of plausible values for the association between biologics and COVID-19 mortality was specified. Bias-adjusted estimates ranged from aHR 0.97 (95% CI 0.75-1.26) to aHR 1.09 (95% CI 0.84-1.40)

indicating that the findings were robust to this one confounder under the specified assumptions.

A frequent challenge in the application of quantitative bias analysis methods in pharmacoepidemiological studies is that there may be multiple unmeasured confounders, as well as some partially measured confounders, and the characteristics of these confounders may not be known. E-values, bias adjustment formulas and other quantitative bias analysis methods can be used in these circumstances,<sup>45, 46, 56, 57</sup> but become difficult to specify accurately given that the extent of confounding depends on the joint association of exposure, outcome, measured covariates and unmeasured confounders, and on the mechanism of misclassification or measurement error in the measured variables.

### **9.2.9 Other methods**

There are further methods that can be applied for handling unmeasured confounding, but which were not applied as part of this thesis.<sup>58, 59</sup> One popular method that was not applied is to use an instrumental variable, which is not associated with the confounder, but is a proxy for exposure, to estimate an unbiased exposure-outcome relationship. Physician or practice-level prescribing preferences can be used as an instrumental variable.<sup>60, 61</sup> However, instrumental variable estimates using prescribing preference can have high variance and in some circumstances may be biased.<sup>62, 63</sup>

## **9.3 Unmeasured confounding in pharmacoepidemiology**

Unmeasured confounding is, and will be in the future, a concern in pharmacoepidemiological studies. Prescribing preferences are complex, leading to subtle differences between exposure groups. Many diseases are multifactorial, and a number of the aetiological pathways may be associated with exposure. If all potential confounders were correctly measured then they could be controlled, but in routinely collected healthcare datasets, such as CPRD, many variables will not be collected or will be imperfectly recorded. Given the data in most EHR sources exist to facilitate clinical care rather than for research, this limitation will not be solved through data collection.

To minimise residual confounding, we need to think carefully about potential confounders at the study design stage, and to use design techniques, such as self-controlled studies and active comparators. In some settings it will not be possible to control all unmeasured confounding, and therefore it is useful to apply diagnostics that can help detect residual confounding, such

as negative control outcomes, secondary comparator groups, and sensitivity analyses at varying time periods. Finally, when it is not possible to control for an unmeasured confounder, quantitative bias analysis can be used to quantify the sensitivity of observed results.

#### **9.4 Causality of the association between PPIs and mortality**

While there was strong evidence for increased mortality with PPI prescribing, there are reasons to think that unmeasured confounding may explain observed findings.

The association between PPIs and mortality was much stronger when compared to a secondary comparator group of non-users than when compared to the active comparator H2RA use. Short term associations were observed with cause-specific mortality from causes which would be expected to take years to develop from initiation. A high-dimensional propensity score reduced the observed estimate towards the null and cannot be guaranteed to have controlled all residual confounding. Quantitative bias analyses could not rule out unmeasured confounding by patient frailty as an explanation for observed results.

Further indication that findings may be due to unmeasured confounding comes from a randomised controlled trial, which did not find increased mortality with PPI use relative to placebo (HR 1.03, 95% CI 0.92–1.15) over a median follow-up of 3.1 years.<sup>64</sup>

#### **9.5 Causality of the association between fluoroquinolones and uveitis, retinal detachment, AA/AD, and peripheral neuropathy**

##### **9.5.1 Fluoroquinolones and hospitalisation with AA/AD**

The evidence for a causal association between fluoroquinolones and hospitalisation with AA/AD, based on both the review of the literature (Chapter 2) and on the cohort and case-crossover studies conducted within this project (Chapter 6), is weak.

There was no association observed relative to active comparators in either the cohort study or case-crossover study. While an association was observed relative to non-use in the case-crossover study, this may be explained by increased acute cardiovascular risk associated with the infection for which the antibiotics are prescribed. There is a possibility that all antibiotics studied increase the risk of AA/AD, but this does not seem likely given that four different medicinal products covering three different product classes were studied.



### **9.5.2 Fluoroquinolones and peripheral neuropathy**

The few epidemiological studies previously conducted all found elevated incidence of peripheral neuropathy with use of fluoroquinolones (Chapter 2).<sup>65-67</sup> In a cohort study I conducted I found limited evidence of an association at first treatment episode, and stronger evidence over all treatment episodes. However, the effect estimates were small, particularly in my study and in another previous cohort study using an active comparator.<sup>67</sup> Larger effect estimates were observed in case-control studies<sup>65, 66</sup>, but the primary comparator in these studies was non-use rather than an active comparator, and hence these studies may be more strongly confounded. It is possible that there is a causal effect of fluoroquinolones, but equally, one or a few unmeasured or partially measured confounders could potentially explain the observed associations.

### **9.5.3 Fluoroquinolones and uveitis and retinal detachment**

There was no evidence of an association in cohort studies or self-controlled case series of an association between fluoroquinolone, relative to cephalosporin, prescribing and either retinal detachment or uveitis.

Two previous case-control studies found increased risks of uveitis with fluoroquinolone prescribing, but this was relative to non-use, a comparison more likely to be biased due to residual confounding.<sup>68, 69</sup> A subsequent cohort study comparing fluoroquinolone to beta-lactam use did not find evidence of an association with uveitis.<sup>70</sup> Taken together these findings bring into question the existence of a causal relationship between fluoroquinolones and uveitis.

For retinal detachment, an initial case-control study identified an elevated rate ratio compared to non-use of 4.50 (95% CI 3.56-5.70).<sup>71</sup> However, both my study and other subsequent studies find either no association or evidence of an association of considerably smaller magnitude (RR < 2).<sup>72-84</sup> Fluoroquinolones are likely prescribed more frequently to individuals at greater risk of retinal detachment, for example to diabetics, and this may confound previous non-interventional studies. In a meta-analysis of non-interventional studies there was no evidence of an association in self-controlled case series, contrary to the findings from between-person study designs such as cohort studies.<sup>85</sup> Likewise in my self-controlled case series I found no evidence of an association. Confounding may be an explanation of the discrepancy between results with different study designs, given that self-

controlled studies inherently control for unmeasured or mismeasured time-invariant confounders. Overall, there is reason to suspect that there may not be a causal relationship between fluoroquinolones and retinal detachment.

## **9.6 Strengths**

### **9.6.1 Methods for handling unmeasured confounding**

A considerable strength of this thesis, and of the studies conducted within this project, has been the application of multiple methods to reduce, diagnose or quantify unmeasured confounding. While these methods do not ‘cure’ the problem of unmeasured confounding in all circumstances, they can help to produce less confounded estimates, to better characterise, and understand, underlying confounding, and to ensure that inappropriate conclusions are not drawn from potentially confounded results.

### **9.6.2 Multiple datasets**

In the studies looking at fluoroquinolone safety, two datasets of primary care records were used: CPRD Aurum and GOLD. Consistency of results across study populations provides evidence for the robustness of study findings. By pooling results, I achieved greater precision than with either database alone. Clinical and prescribing events are coded differently in the two datasets, and therefore for each database different code lists must be developed. Similar frequencies of covariates across databases, and similar results when adjusting for those covariates, indicates robustness both against code-list misspecification, and against differences in recording by clinicians using the two different software systems (EMIS in Aurum, Vision in GOLD).<sup>86, 87</sup>

### **9.6.3 Multiple study designs**

The use of both cohort and self-controlled studies enables a better understanding of risk and of potential confounding. In cohort studies we can control for measured covariates, time-varying or time-invariant, through statistical methods such as multivariable regression. Self-controlled studies are invulnerable to unmeasured confounders that are time-invariant over the study period. However, these studies are vulnerable to time-varying confounders (both measured and unmeasured). Discrepancies between the different study designs can provide useful information about underlying confounding or causation.<sup>88</sup> Consistency of results between study designs, such as that observed with AA/AD, uveitis, and retinal detachment, increases confidence in the robustness of study findings.

## **9.7 Limitations**

### **9.7.1 Exposure misclassification**

There may be exposure misclassification in the studies I conducted looking at the safety of PPI and fluoroquinolone prescribing. Both PPIs and H2RAs are available as over the counter (OTC) medicines, and this OTC usage is not captured in the CPRD data used. However, sensitivity analyses restricting follow-up to 31<sup>st</sup> December 2014, before PPIs became available OTC, had little effect on estimates. There is still potential for bias given that PPIs were available pharmacy-only prior to this date, which would not be reported to the GP, and given that H2RAs were available OTC prior to 2015. As I do not anticipate that H2RAs have a causal effect on mortality, I might expect that if PPIs do have a causal effect, then the presence of H2RA users taking pharmacy-only PPIs could bias results towards the null.

Hospital prescribing data was not available for either the PPI or the fluoroquinolone studies. One potential concern is that patients who are unwell and hospitalised may be more likely to start these drugs in hospital than to start the active comparator, and that prescribing of the same drug will continue in primary care. Such hospitalised patients are likely to have underlying health conditions, which may increase their risk of the outcomes under investigation. I do, however, adjust for the number of hospital admissions within the 6 months prior to treatment initiation, in studies of fluoroquinolones and PPIs using HES APC data.

Adherence is not recorded in CPRD, or in many other routinely collected healthcare datasets. There may be some misclassification of exposure where individuals prescribed the drug do not take the medicine. This is particularly a concern for PPIs and H2RAs, which are indicated for less severe and acute indications than fluoroquinolones. Given I anticipate this misclassification to be non-differential with respect to the outcome, I would expect this misclassification could introduce some bias towards the null.

### **9.7.2 Outcome misclassification**

It is anticipated that ONS date of death is accurate. It is a legal requirement in England and Wales for all deaths to be promptly registered.<sup>89</sup> In England and Wales, cause of death is ascertained by a medical professional, or by a coroner after a post-mortem if the cause of death is unclear, and recorded on a Certificate of Cause of Death. However, specification of a single underlying cause of death will often be an oversimplification.<sup>90,91</sup> Therefore, in the PPI

study I conducted a sensitivity analysis where I looked at cause-specific mortality, with cause of death based on all recorded causes rather than just the specified underlying cause. This sensitivity analysis had little effect on observed estimates.

The degree of misclassification in the fluoroquinolone studies is likely to be dependent on the specific outcome. Hospitalisation is a well-defined event, and aortic aneurysm or dissection are clearly classified by ICD-10 code. Hence, for this outcome, misclassification is of less concern. In contrast, peripheral neuropathy is an umbrella term for multiple neuropathies affecting the peripheral nervous system and is not a well-defined clinical entity.<sup>92</sup>

Furthermore, it may not be reported to the clinician promptly by the patient. Hence there may be misclassification of this outcome, though it is not clear that this misclassification will be associated with exposure status. For retinal detachment, to increase specificity of outcome classification, on the basis of advice from an ophthalmologist, the primary definition of retinal detachment required both a diagnostic clinical code and a procedural code. Sensitivity analysis varying the definition of retinal detachment and uveitis had little effect on estimates.

### **9.7.3 Covariate misclassification**

Residual bias in the studies may exist due to partial recording of some confounders.

Furthermore, binary indicators of disease presence or absence do not capture differences in severity or stage of disease that may exist between groups. Methods to detect residual confounding by unmeasured confounders, such as negative control outcomes, should also detect residual confounding due to misclassified confounders.

## **9.8 Future research**

For the investigation of PPIs, the study findings highlight the challenges in inferring causal effects regarding PPI safety from observational data. Future researchers investigating this safety area with epidemiological studies would do well to be cautious about this potential bias. It may be that only further randomised controlled trial evidence can fully settle safety questions for this class of medication.

Further investigation of the risk of aortic aneurysms or dissections by infection type could be informative for the issue of fluoroquinolone, and other antibiotic safety. If particular infections pose increased risk, then it may be possible to manage risk of AA/AD among these patients, and thereby reduce the occurrence of ruptured aortic aneurysms and aortic dissections, which are frequently fatal events.<sup>93</sup>

For uveitis there was little evidence for a causal effect of fluoroquinolones, but the study was not powered to examine risk with moxifloxacin for which most spontaneous case reports of uveitis have been reported. Analysis of risk with moxifloxacin in larger databases could be useful, though careful control for confounding and use of methods to handle unmeasured confounding would be key. Moxifloxacin is prescribed differently from other fluoroquinolones, including increased use in some ocular indications, so there is clear potential for confounding of the association.

Investigators looking at fluoroquinolone safety with respect to peripheral neuropathy and retinal detachment should be careful to choose an appropriate comparator and to apply methods to diagnose, reduce and quantify unmeasured confounding. In addition to the methods outlined in this thesis, other methods including target trial emulation and trial benchmarking show promise for more robust estimation of causal effects.<sup>94, 95</sup>

In terms of methods, further research is needed on how best to apply quantitative bias analysis methods with multiple unmeasured confounders and partially measured confounders. Furthermore, additional software that make the application of quantitative bias analysis easier would facilitate greater uptake of these methods.

## **9.9 Conclusions**

In conclusion, unmeasured confounding is a major concern in pharmacoepidemiological studies. However, there are approaches that can be used to detect residual confounding due to unmeasured confounders, to reduce the extent of unmeasured confounding present, and to quantitatively assess the robustness of observed results to this unmeasured confounding. These approaches, which include negative control outcomes, a secondary comparator group, the high-dimensional propensity score, sensitivity analyses with varying time periods, quantitative bias analyses, and self-controlled studies with active comparators, were applied in this project to two drug safety issues: the association between prescribing of PPIs and mortality; and the associations between fluoroquinolone prescribing and uveitis, retinal detachment, hospitalisation with AA/AD, and peripheral neuropathy.

When investigating these drug safety issues, methods for handling unmeasured confounding provided insight. An association was observed in a cohort study between PPIs and increased mortality but, based on secondary analyses and sensitivity analyses including quantitative bias analysis, there were reasons to suggest unmeasured confounding as an explanation. An

association was observed between fluroquinolones and hospitalisation with AA/AD relative to non-use, but not relative to active comparators, indicating possible unmeasured confounding of the non-use comparison by the underlying infection for which antibiotics are prescribed. For peripheral neuropathy, E-values and Cornfield conditions indicated the strength of unmeasured confounding necessary to potentially explain the observed association.

Further development and application of methods for handling unmeasured confounding, alongside increased rigorous thinking concerning confounders, both measured and unmeasured, at the study design stage, has the potential to improve pharmacoepidemiological studies and to reduce the number of false associations reported in the literature. The methods presented in this thesis allow investigators to reduce, diagnose, and quantify potential unmeasured confounding. For non-interventional evidence to be useful to regulators the extent of potential unmeasured confounding must be clear.

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**APPENDIX 1: SUPPLEMENTARY INFORMATION FOR  
MANUSCRIPT ON QUANTITATIVE BIAS ANALYSIS**

## **Supplement 1: Commonly applied bias formulas and bounding methods**

### **Quantitative bias analysis for unmeasured confounding**

#### **Bias formulas**

##### Risk ratios

The simplest setting is when there is a binary exposure  $Z$ , binary outcome  $Y$ , binary unmeasured confounder  $U$ , and no effect measure modification of the unmeasured confounder-outcome association by the exposure on the risk ratio scale.

In this situation a bias formula can be applied to the observed risk ratio,  $RR_{ZY(Obs)}$ , to calculate a bias-corrected risk ratio  $RR_{ZY(BiasCorr)}$ . The bias formula (1) is based on the risk ratio between unmeasured confounder and outcome  $RR_{UY|Z}$  adjusted for exposure, the prevalence of the unmeasured confounder amongst exposed,  $P(U = 1|Z = 1)$ , and unexposed,  $P(U = 1|Z = 0)$ , and the observed risk ratio  $RR_{ZY}$ .<sup>1</sup>

$$RR_{ZY(BiasCorr)} = RR_{ZY(Obs)} \frac{1 + P(U = 1|Z = 0)(RR_{UY|Z} - 1)}{1 + P(U = 1|Z = 1)(RR_{UY|Z} - 1)} \quad (1)$$

##### Categorical and multiple unmeasured confounders

We can instead specify that  $U$  is categorical, with reference level  $u'$ . In this setting we must specify stratum-specific prevalence of the unmeasured confounder and associations between each level of unmeasured confounder  $u$  and outcome, relative to the reference level  $u'$ . Again, we assume no effect modification of the unmeasured confounder-outcome association by the exposure on the risk ratio scale, leading to the bias formula (2).<sup>2</sup>

$$RR_{ZY(BiasCorr)} = RR_{ZY(Obs)} \frac{P(U = u'|Z = 0) + \sum_u RR_{uu'|Y|Z} P(U = u|Z = 0)}{P(U = u'|Z = 1) + \sum_u RR_{uu'|Y|Z} P(U = u|Z = 1)} \quad (2)$$

To incorporate multiple unmeasured confounders, we can specify multiple variables as one categorical variable (e.g., for alcohol and tobacco consumption: non-smoker non-drinker, smoker non-drinker, non-smoker drinker, smoker drinker).



### Risk difference

We can calculate a bias-corrected risk difference,  $RD_{ZY(BiasCorr)}$ , with a simple formula assuming a binary unmeasured confounder and no effect modification by the exposure, on the risk difference scale, of the unmeasured confounder-outcome association. We need only specify the observed risk difference,  $RD_{ZY(Obs)}$ , the risk difference for the unmeasured confounder-outcome association adjusted for exposure,  $RD_{UY|Z}$ , and the difference in prevalence of the unmeasured confounder between exposure groups, as follows<sup>2</sup>:

$$RD_{ZY(BiasCorr)} = RD_{ZY(Obs)} - RD_{UY|Z}(P(U = 1|Z = 1) - P(U = 1|Z = 0)) \quad (3)$$

Formulas for more general cases relaxing these assumptions are available, such as for categorical unmeasured confounders, though these formulas become more complicated to specify.<sup>2</sup>

### Other effect estimates

We can use formulas (1) and (2) for rate ratios, replacing all risk ratios in the equation with rate ratios.

If the outcome is rare, and hence the odds ratio is a good approximation to the risk ratio, we can substitute the odds ratio for the risk ratio in formulas (1) and (2).<sup>2</sup> Exact formulas for the bias of the odds ratio are available, but are more difficult to specify practically.<sup>2</sup> If the outcome is rare, the hazard ratio approximates the risk ratio, and can be substituted for the risk ratio in formulas (1) and (2).<sup>3</sup> Bias formulas are also available for marginal treatment effects such as the average effect of treatment in the overall study population, the average effect of treatment among the treated group, and the average effect of treatment amongst the untreated group.<sup>2</sup>

### Random error

Formulas (1-3) can be applied to the bounds of the 95% CI to account for random error.<sup>2</sup> Alternatively, bootstrapping can be used to calculate confidence intervals.<sup>2</sup> Random error can also be incorporated as part of a probabilistic bias analysis.<sup>4</sup>

### **Incorporating measured covariates**

We can apply formulas (1-3) to effect measures conditioned on measured covariates. However, we then need to use ratios or differences between unmeasured confounder and outcome within strata of measured covariates, and the prevalence of the unmeasured confounder within each stratum of the measured covariates.

If we assume no effect modification of the exposure-outcome association by the measured covariates, then we can use prevalence of unmeasured confounder within any one stratum of measured covariates to calculate a bias-corrected association (e.g., if adjusting for binary [yes/no] diabetes status, then prevalence of unmeasured confounder amongst exposed and unexposed diabetics).

Alternatively, measured covariates can be incorporated as part of a probabilistic bias analysis with correction performed at the patient record-level.<sup>4</sup>

## **Bounding methods**

### Cornfield conditions

We can specify bounds on the bias-corrected estimate. In order for an unmeasured confounder positively associated with the outcome to potentially reduce the positive bias-corrected risk ratio between exposure and outcome to a specific value (e.g. a risk ratio of one, a typical null-hypothesis value), the association between unmeasured confounder and outcome  $RR_{UY|Z}$ , and between exposure and unmeasured confounder  $RR_{ZU}$ , must be greater than the ratio of the observed risk ratio  $RR_{ZY(Obs)}$  to the bias-corrected risk ratio (4, 5).<sup>1, 5, 6</sup> These bounds are known as Cornfield conditions.

$$RR_{UY|Z} \geq \frac{RR_{ZY(Obs)}}{RR_{ZY(BiasCorr)}} \quad (4)$$

$$RR_{ZU} \geq \frac{RR_{ZY(Obs)}}{RR_{ZY(BiasCorr)}} \quad (5)$$

These bounds also apply exactly to rate ratios (replacing risk ratios with the outcome with rate ratios), and approximately to odds ratio or hazard ratios when the outcome is rare.<sup>7</sup>

These bounds, while true, are very conservative. We can only rule out unmeasured confounding as an explanation if either of these inequalities is not true. We cannot say that unmeasured confounding is likely if these inequalities are satisfied.

### E-values

A less conservative bound, known as the E-Value, can also be specified if we consider jointly the association between unmeasured confounder and outcome  $RR_{UY|Z}$  and between exposure and unmeasured confounder  $RR_{UZ}$ .<sup>5</sup> One of the exposure-unmeasured confounder and unmeasured confounder-outcome associations must be as large as or larger than the threshold

(6) to potentially reduce the observed estimate to the specified (usually null) bias-corrected estimate. The calculated E-Value will be larger in value than the Cornfield conditions,

$$\max(RR_{ZU}, RR_{UY|Z}) \geq RR_{ZY(Obs)} + \left\{ \sqrt{RR_{ZY(Obs)}(RR_{ZY(Obs)} - RR_{ZY(BiasCorr)})} \right\} / RR_{ZY(BiasCorr)} \quad (6)$$

If both of these risk ratios are below this threshold, then the unmeasured confounder cannot reduce the observed association to the specified bias-corrected value.

This formula can also be applied to the rate ratio, and assuming the outcome is rare, to the odds ratio or hazard ratio.

### Random error

Formulas (4) to (6) can be applied to the limits of the 95% confidence interval to account for random error.<sup>5</sup>

### Positive associations

These formulas assume positive associations between unmeasured confounder and outcome and between exposure and outcome. For protective (i.e., negative) associations we can redefine the reference level of the outcome.

### Incorporating measured covariates

A major advantage of bounding methods is the ease of application to adjust for bias with covariate-adjusted estimates. We can apply the bounding formulas to covariate-adjusted estimates without the need to specify strata-specific prevalence of unmeasured confounder.

### *Quantitative bias analysis for misclassification*

#### **Bias formulas**

We can apply bias formulas for exposure or outcome misclassification to 2x2 tables.<sup>4</sup>

#### Exposure misclassification

Consider a 2x2 table with true binary exposure Z, misclassified binary exposure Z', and binary outcome Y.

|              | <b>Z' = 1</b> | <b>Z' = 0</b> |
|--------------|---------------|---------------|
| <b>Y = 1</b> | a             | b             |
| <b>Y = 0</b> | c             | d             |

We can calculate a corrected table using the sensitivity [Se] (i.e., proportion of those who truly are exposed who are categorised as exposed), false negative probability [Fn] (i.e., 1-Se) , specificity [Sp] (i.e. proportion of those who are unexposed who are categorised as unexposed), and false positive probability [Fp] (i.e., 1-Sp). If misclassification is differential (i.e., it depends on the outcome value) then we have to specify sensitivity and specificity separately amongst those with and without outcome (as indicated by  $Se_{Y1}$ , etc.).

|              | <b>Z = 1</b>  | <b>Z = 0</b>    |
|--------------|---|-----------------|
| <b>Y = 1</b> | $A = \frac{aSp_{Y1} + bFp_{Y1}}{Sp_{Y1}Se_{Y1} - Fn_{Y1}Fp_{Y1}}$ | $B = a + b - A$ |
| <b>Y = 0</b> | $C = \frac{cSp_{Y0} + dFp_{Y0}}{Sp_{Y0}Se_{Y0} - Fn_{Y0}Fp_{Y0}}$ | $D = c + d - C$ |

### Outcome misclassification

Consider a 2x2 table with misclassified binary outcome Y' and binary exposure Z.

|               | <b>Z= 1</b> | <b>Z = 0</b> |
|---------------|-------------|--------------|
| <b>Y' = 1</b> | a           | b            |
| <b>Y' = 0</b> | c           | d            |

We can calculate a corrected table using the sensitivity [Se] (i.e., proportion of those who truly have the outcome who are categorised as having the outcome), false negative probability [Fn] (i.e., 1-Se) , specificity [Sp] (i.e. proportion of those who truly do not have outcome who are categorised as not having the outcome), and false positive probability [Fp] (i.e., 1-Sp). If misclassification is differential (i.e. it depends on the exposure value) then we have to specify sensitivity and specificity separately for exposed and unexposed groups (as indicated by  $SE_{Z1}$ , etc.).

|              | <b>Z= 1</b>   | <b>Z = 0</b>  |
|--------------|---|---|
| <b>Y = 1</b> | $A = \frac{aSp_{Z1} + cFp_{Z1}}{Sp_{Z1}Se_{Z1} - Fn_{Z1}Fp_{Z1}}$ | $B = \frac{bSp_{Z0} + dFp_{Z0}}{Sp_{Z0}Se_{Z0} - Fn_{Z0}Fp_{Z0}}$ |
| <b>Y = 0</b> | $C = a + c - A$   | $D = b + d - B$   |

### Sensitivity and specificity

Quantitative bias analysis formulas applied to 2x2 tables are also available which use the positive predictive value (PPV) and negative predictive value (NPV).<sup>4</sup> Choice of formula will depend on which parameters are easier for the investigator to specify based on information available. Sensitivity and specificity may be preferred if using information from an external population rather than information from an internal validation study given that PPV and NPV can vary considerably between populations depending on variable prevalence.<sup>8</sup>

### Incorporating measured covariates

We can stratify the 2x2 tables by measured covariates and average the adjusted results. This is, however, challenging if there are a large number of measured covariates, or if there are continuous covariates.

Measured covariates can alternatively be accounted for by performing probabilistic bias analysis with patient record-level correction. Modification of the regression likelihood can be used with logistic regression to adjust for bias due to outcome misclassification while adjusting for measured covariates.<sup>9</sup>

### Random error

Random error can be incorporated through bootstrapping or as part of a probabilistic bias analysis.

### **Quantitative bias analysis for selection bias**

#### **Bias formulas**

##### 2x2 tables

We can apply bias formulas to 2x2 tables or to an odds ratio.

Consider a 2x2 table with exposure Z and outcome Y.

|              | <b>Z = 1</b> | <b>Z = 0</b> |
|--------------|--------------|--------------|
| <b>Y = 1</b> | A            | B            |
| <b>Y = 0</b> | C            | D            |

We can create a bias adjusted table by dividing each table cell by the selection probability for that combination of exposure and outcome ( $S_{00}$  etc.).

|  | <b>Z = 1</b> | <b>Z = 0</b> |
|--|--------------|--------------|
|--|--------------|--------------|

|              |                   |                   |
|--------------|-------------------|-------------------|
| <b>Y = 1</b> | a/S <sub>11</sub> | b/S <sub>01</sub> |
| <b>Y = 0</b> | c/S <sub>10</sub> | d/S <sub>00</sub> |

### Odds ratios

To adjust an odds ratio for bias, we can multiply the observed odds ratio by a function of the selection probabilities, as follows:

$$OR_{ZY(BiasAdj)} = OR_{ZY(Obs)} \frac{S_{01}S_{10}}{S_{00}S_{11}}$$

### Risk or hazard ratios

When the outcome is rare, the odds ratio will approximate the risk ratio, and this, in turn, when the outcome is rare at the end of follow-up, will approximate the hazard ratio. Hence the formula above can be applied to the risk ratio or hazard ratio with a rare outcome, with the proviso that it is an approximation rather than exact.

### Incorporating measured covariates

We can apply these bias formulas within strata of measured covariates, though this is challenging when there are many covariates.

If we assume that the probability of selection is independent of measured covariates given exposure and outcome, we can apply the formula for the bias-corrected odds ratio to the odds ratio adjusted for measured covariates.

Measured covariates can also be accounted for as part of probabilistic bias analysis with patient record-level correction when record-level data is available.

### Incorporating random error

We can apply the formula for odds ratios not only to the point estimate of association, but also to the limits of the 95% confidence interval. More generally, random error can be incorporated by bootstrapping or as part of a probabilistic bias analysis.

### Inverse probability of selection weighting

It can be cumbersome to stratify data by measured covariates,  $C$ , if there are many covariates. An alternative is to weight each data point by the inverse of the probability of selection.<sup>10</sup> For loss to follow-up if censoring is independent of the outcome given specified covariates that are measured amongst those lost to follow-up then we can estimate inverse probability of

censoring weights from the sample data rather specifying the weights based on external information.

$$w_i = \frac{1}{P(S = 1|Z = z, Y = y, C = c)}$$

## **Supplement 2: Tools and packages**

Spreadsheets for conducting quantitative bias analysis, which accompany the book *Applying Quantitative Bias Analysis* by Fox et al. 2021, are available online:

<https://sites.google.com/site/biasanalysis/>.

An R package *episensr* and SAS macro *sensmac* are available for application of bias formulas.

For E-values, an E-value calculator is available online: <https://www.evalue-calculator.com/>.

Furthermore, there is an R package *EValue* and a Stata package *EVALUE*.

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**APPENDIX 2: SUPPLEMENTARY INFORMATION**  
**MANUSCRIPT ON ASSOCIATIONS BETWEEN PROTON**  
**PUMP INHIBITORS AND MORTALITY**

## Supplementary Methods

### Summary of methods for examining robustness of results to confounding

| Method   | Description   |
|--|---|
| Multiple comparator groups   | We included two comparator groups (H2 receptor antagonist [H2RA] users and non-users) to compare with PPI users. Using average effect of treatment in the treated (ATT) weights, we estimated the same effect in both analyses: the effect of proton pump inhibitor (PPI) prescription amongst PPI users. We would expect to observe similar results using both comparators in the absence of uncontrolled confounding and assuming no causal effect of H2RAs on mortality.   |
| Negative control outcomes  | <p>We included outcomes that have not previously been associated with PPI use.</p> <p>One of these variables, accidental trauma, we did not expect to be associated with the exposure or confounders. An association observed with this variable may indicate selection bias or other biases.</p> <p>We also included an outcome that we did not expect to be associated causally (pulmonary embolism), but that we expected may be associated with PPIs through a confounder (patient frailty). An association with this control outcome may indicate residual confounding by this confounder.</p>   |
| Weighting using the propensity score derived from investigator-chosen covariates | A reduction in effect estimates after adjusting for covariates provides an indication that there is confounding which is being adjusted for. The extent of the reduction in effect estimates can provide an indication on the strength of confounding.  |
| Weighting using the high-dimensional propensity score (hd-PS)                    | <p>The hd-PS is a method for selecting a large number of covariates into a propensity score model that has been developed for use in insurance claims and electronic health record data. It has been suggested that using a high-dimensional propensity score may control for additional confounding relative to a propensity score based on investigator-chosen covariates.</p> <p>A reduction in effect estimates using the hd-PS, relative to a propensity score based on investigator-chosen covariates, provides an indication that the analysis using the investigator-chosen covariate propensity score may have residual confounding.</p> |
| Hazard ratios over different periods of follow-up                                | We estimated hazard ratios over different periods of follow-up (6 months, 1 year, up to ten years, all follow-up). For many outcomes we would not expect to observe an association with outcome incidence shortly after treatment initiation given disease  |

|  |   |
|--|---|
|  | pathogenesis. An association observed at 6 months for these outcomes may be explained by confounding. |
|--|---|

### **Covariate definition and parameterisation**

| <b>Covariate</b>   | <b>Definition and parameterisation</b>  |
|--|---|
| <b>Demographic and lifestyle variables</b>                                   |   |
| Age  | Continuous covariate calculated at baseline based on date of birth. Included in propensity score (PS) model as a restricted cubic spline with five knots. Interaction between age and sex included in PS model. |
| Sex  | Binary covariate. Interaction with age and BMI included in PS model.  |
| Index of multiple deprivation (IMD) score                                    | Categorical covariate defined by IMD score twentile. IMD score was calculated by the data provider based on patient postcode.   |
| Body mass index  | Continuous covariate calculated based on recorded height and weight measurements. Interaction with sex included in PS model. Missing indicator approach used for missing values.                                |
| Smoking status   | Categorical covariate (non-smoker, smoker, ex-smoker). Missing indicator approach used for missing values.  |
| Alcohol status and level   | Categorical covariates (non-drinker, ex-drinker, current drinker; light, moderate, heavy consumption). Missing indicator approach used for missing values.  |
| <b>Potential indications for PPI treatment in 6 months prior to baseline</b> |   |
| NSAID  | Binary covariate based on presence of a relevant recorded prescription within 6 months prior to index date.   |
| Aspirin  |   |
| Oral anticoagulant   |   |
| Clopidogrel  |   |
| Inhaled steroid  |   |
| Systemic steroid   |   |
| Upper gastrointestinal endoscopy   | Binary covariate based on presence of a relevant Read code within 6 months prior to index date.   |
| Gastric cancer   |   |
| Gastro-oesophageal reflux disease  |   |
| Peptic ulcers  |   |
| Upper gastrointestinal bleeding  |   |
| Pancreatitis   |   |
| Cirrhosis  |   |
| Oesophagitis   |   |
| Barrett's oesophagus   |   |
| <i>H. pylori</i> infection   |   |
| <b>Indicators of frailty in 6 months prior to baseline</b>                   |   |
| Number of hospital admissions  | Categorical covariate (0, 1, 2, 3, 4+) derived from number of hospital admissions in 6 months prior to index date within linked Hospital Episode Statistics Admitted Patient Care data.                         |
| Number of general practitioners (GP) appointments                            | Categorical covariate (0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11-12, 13-14, 15-19, 20-29, 30+) derived from number of GP appointments in 6 months prior to index date.   |
| Number of different drug types prescribed                                    | Categorical covariate (0, 1, 2, 3, 4, 5, 6, 7, 8+) derived from number of different BNF chapters prescribed in 6 months prior to index date.  |

| <b>Ever recorded previous comorbidities</b> |  |
|---|--|
| Hypertension                                | Binary covariate based on presence of a Read code ever prior to index date.  |
| Coronary heart disease                      |  |
| Heart failure                               |  |
| Peripheral artery disease                   |  |
| Cerebrovascular disease                     |  |
| Other atheroma                              |  |
| Chronic obstructive pulmonary disease       |  |
| Cancer                                      |  |
| Non-viral liver disease                     |  |
| HIV   |  |
| Dementia                                    |  |
| Diabetes                                    |  |
| Chronic kidney disease                      | Binary covariate derived from calculated eGFR.   |
| <b>Other</b>                                |  |
| Calendar year                               | Categorical covariate derived from calendar year at index date (1998-2003, 2004-2009, 2010-2015). Given strong association between exposure and calendar year, propensity scores were estimated within each category of calendar year. |

## **High-dimensional propensity score estimation**

The high-dimensional propensity score (hd-PS) is a semi-automated approach to confounder selection in large healthcare databases. There are a number of investigator decisions to be made when using this approach:

**1. Identify dimensions which reflect aspects of care.**

We identified the following dimensions:

Clinical (Read codes): Signs, symptoms and diagnoses

Referral (Read codes): Indicate a possible escalation in care

Prescriptions (BNF codes): Patterns of drug usage

**2. Sort codes by prevalence within each dimension.**

We selected the top 200 most prevalent codes from each dimension.

**3. Prioritise result hd-PS covariates**

Covariates were prioritised using the Bross Formula, which prioritises covariates with most potential to bias the treatment-outcome relationship of interest.

**4. Select the top k covariates**

Separately for each outcome we selected the top 500 covariates to be included in the propensity score alongside the investigator-chosen covariates.

We added hd-PS covariates to the propensity score model to supplement investigator-chosen covariates.

## Supplementary Results

**Table S1: International Classification of Disease (ICD) chapters and codes used for outcome definitions**

| Cause of death outcomes                           | Relevant ICD-10 chapters/codes        | Relevant ICD-9 codes                  |
|---|---------------------------------------|---------------------------------------|
| <b><i>Top-level outcomes</i></b>                  |                                       |                                       |
| Communicable diseases                             | A, B, J00-22                          | 1-139, 460-469, 480-488               |
| Non-communicable diseases                         | C through R                           | 140-459, 470-479, 490-799             |
| Injuries/external                                 | S through Y                           | 800-999, E001-E999                    |
| <b><i>Second-level outcomes</i></b>               |                                       |                                       |
| Neoplasms   | C                                     | 140-239                               |
| Cardiovascular/circulatory                        | I                                     | 390-459                               |
| Chronic respiratory diseases                      | J23-99                                | 470-478, 490-519                      |
| Liver cirrhosis                                   | K70.3, K71.7, K74.3-6                 | 571.2, 571.5, 571.6                   |
| Digestive other than cirrhosis                    | K except codes above                  | 520-579 (except 571.2, 571.5 & 571.6) |
| Neurological                                      | G                                     | 320-359, 290                          |
| Mental and behavioural                            | F                                     | 291-319                               |
| Diabetes, urogenital, blood and endocrine         | D50-89, E, N                          | 240-289, 580-629                      |
| Musculoskeletal                                   | M                                     | 710-739                               |
| <b>Individual causes</b>                          |                                       |                                       |
| Pneumonia   | J10.0, J11.0, J12-J18                 | 480-486, 487.0, 514                   |
| Acute kidney injury                               | N17                                   | 584                                   |
| Enterocolitis due to <i>Clostridium difficile</i> | A04.7                                 | 008.45                                |
| Atrial fibrillation/flutter                       | I48                                   | 427.3                                 |
| Heart failure                                     | I50                                   | 428                                   |
| Aortic Aneurysm                                   | I71                                   | 441                                   |
| Dementia and Alzheimer's disease                  | F00, F01, F03, G30                    | 290, 294.2, 331                       |
| Chronic kidney disease                            | N18                                   | 585                                   |
| Hypertensive heart disease                        | I11                                   | 402                                   |
| Ischaemic heart disease                           | I20-I25                               | 410-414                               |
| Accidental trauma (excluding falls)               | V01-X59 (excluding W00-W19), Y86, Y86 | E800-E928 (excluding E870-E888)       |
| Pulmonary embolism                                | I26                                   | 415.1-415.19                          |
| Lung cancer                                       | C34                                   | 162 (except 162.0 & 162.2)            |
| Mesothelioma                                      | C45                                   | 163                                   |
| Breast cancer                                     | C50                                   | 174                                   |
| Liver cancer                                      | C22                                   | 155                                   |

|                         |         |              |
|-------------------------|---------|--------------|
| Prostate cancer         | C61     | 185          |
| COPD                    | J40-J44 | 490-492, 496 |
| Alcoholic liver disease | K70     | 571.0-571.3  |
| Gastric cancer          | C16     | 151          |

***Table S2: Absolute standardised differences between PPI and H2RA users before and after weighting***

| Characteristic                                   | Unweighted |          | Weighted  |          | Unweighted ASD | Weighted ASD |
|--|------------|----------|-----------|----------|----------------|--------------|
|  | H2RA user  | PPI user | H2RA user | PPI user |                |              |
| Effective sample size                            | 124,410    | 733,885  | 732,547.6 | 733,885  |                |              |
| Mean age in years                                | 51.2       | 54.9     | 55.0      | 54.9     | 0.204          | 0.006        |
| Mean BMI   | 26.5       | 27.2     | 27.2      | 27.2     | 0.118          | <0.001       |
| Calendar year                                    |            |          |           |          |                |              |
| 1998-2003  | 56.7%      | 14.2%    | 14.2%     | 14.2%    | 1.135          | 0.001        |
| 2004-2009  | 31.3%      | 41.6%    | 41.6%     | 41.6%    | 0.210          | <0.001       |
| 2010-2015  | 12.0%      | 44.2%    | 44.2%     | 44.2%    | 0.678          | 0.001        |
| Female   | 57.3%      | 54.7%    | 54.1%     | 54.7%    | 0.052          | 0.014        |
| Current smoker                                   | 24.3%      | 19.6%    | 19.7%     | 19.6%    | 0.119          | 0.002        |
| Ex-smoker  | 24.3%      | 33.3%    | 33.2%     | 33.4%    | 0.195          | 0.005        |
| High alcohol intake                              | 2.7%       | 3.4%     | 3.4%      | 3.4%     | 0.039          | <0.001       |
| Below national median IMD                        | 49.4%      | 51.8%    | 51.7%     | 51.8%    | 0.048          | 0.002        |
| <b>In 6 months prior to treatment initiation</b> |            |          |           |          |                |              |
| Number of hospital admissions                    | 0.3        | 0.4      | 0.4       | 0.4      | 0.052          | 0.001        |
| Number of GP appointments                        | 4.8        | 5.9      | 6         | 5.9      | 0.165          | 0.003        |
| Number of BNF drug chapters                      | 2.3        | 2.5      | 2.5       | 2.5      | 0.078          | 0.016        |
| NSAID  | 21.3%      | 32.1%    | 31.5%     | 32.1%    | 0.236          | 0.012        |
| Aspirin  | 11.7%      | 15.0%    | 14.9%     | 15.0%    | 0.093          | 0.004        |
| Clopidogrel                                      | 1.6%       | 2.1%     | 2.2%      | 2.1%     | 0.036          | 0.009        |
| Oral anticoagulant                               | 2.0%       | 2.4%     | 2.5%      | 2.4%     | 0.022          | 0.010        |
| Inhaled steroid                                  | 11.4%      | 12.8%    | 13.1%     | 12.8%    | 0.045          | 0.009        |
| Systemic steroid                                 | 6.7%       | 7.2%     | 7.2%      | 7.2%     | 0.018          | 0.002        |
| Upper GI bleed                                   | 0.8%       | 1.3%     | 1.3%      | 1.3%     | 0.045          | 0.001        |
| Gastric cancer                                   | 0.0%       | 0.1%     | 0.0%      | 0.1%     | 0.014          | 0.005        |
| GORD   | 7.0%       | 8.4%     | 8.7%      | 8.4%     | 0.052          | 0.009        |
| Peptic ulcer                                     | 0.3%       | 0.9%     | 0.9%      | 0.9%     | 0.067          | 0.001        |
| Upper GI endoscopy                               | 0.0%       | 0.1%     | 0.1%      | 0.1%     | 0.020          | 0.002        |
| Pancreatitis                                     | 0.1%       | 0.1%     | 0.2%      | 0.1%     | 0.002          | 0.007        |
| Cirrhosis  | 0.0%       | 0.1%     | 0.1%      | 0.1%     | 0.022          | 0.006        |
| Oesophagitis                                     | 2.7%       | 3.5%     | 3.5%      | 3.5%     | 0.048          | <0.001       |



|                           |       |       |       |       |       |        |
|---------------------------|-------|-------|-------|-------|-------|--------|
| Barrett's oesophagus      | 0.0%  | 0.2%  | 0.2%  | 0.2%  | 0.048 | 0.003  |
| H pylori infection        | 0.5%  | 1.5%  | 1.6%  | 1.5%  | 0.088 | 0.005  |
| <b>Ever previous</b>      |       |       |       |       |       |        |
| Hypertension              | 19.7% | 26.1% | 25.9% | 26.1% | 0.149 | 0.005  |
| Coronary Heart Disease    | 8.0%  | 8.2%  | 8.3%  | 8.2%  | 0.010 | <0.001 |
| Heart failure             | 2.0%  | 2.0%  | 2.0%  | 2.0%  | 0.002 | 0.003  |
| Peripheral artery disease | 2.0%  | 2.2%  | 2.2%  | 2.2%  | 0.013 | 0.001  |
| Cerebrovascular disease   | 3.7%  | 4.6%  | 4.8%  | 4.6%  | 0.043 | 0.011  |
| Other atherosclerosis     | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.006 | 0.006  |
| COPD                      | 2.6%  | 3.6%  | 3.7%  | 3.6%  | 0.055 | 0.003  |
| Cancer                    | 7.4%  | 10.1% | 10.5% | 10.1% | 0.093 | 0.012  |
| Non-viral liver disease   | 0.6%  | 1.0%  | 0.9%  | 1.0%  | 0.045 | 0.007  |
| HIV                       | 0.1%  | 0.1%  | 0.1%  | 0.1%  | 0.004 | 0.004  |
| CKD                       | 8.8%  | 13.9% | 13.9% | 13.9% | 0.150 | 0.002  |
| Dementia                  | 0.5%  | 0.9%  | 1.0%  | 0.9%  | 0.047 | 0.011  |
| Diabetes                  | 5.2%  | 7.7%  | 7.7%  | 7.7%  | 0.097 | <0.001 |

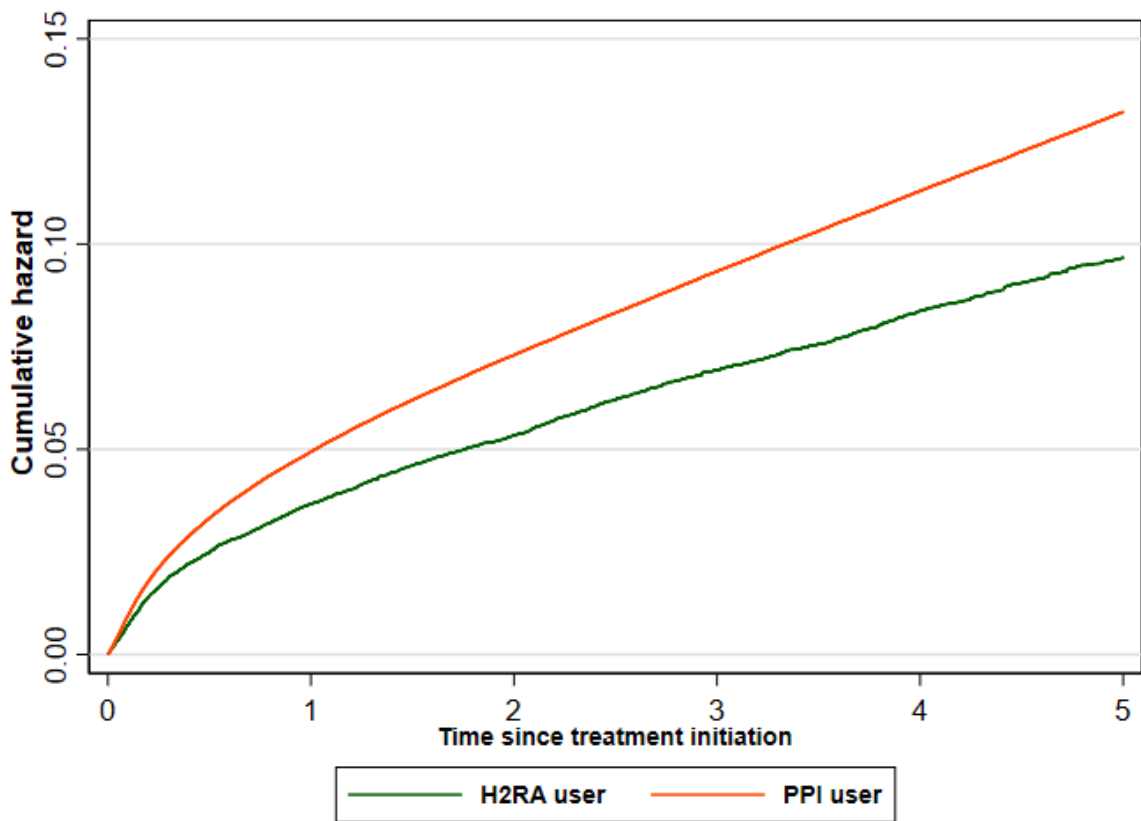
Abbreviations: ASD, absolute standardised difference; H2RA, H2 receptor antagonist; PPI, proton pump inhibitor; BMI, body mass index; IMD, Index of Multiple Deprivation; GP, General Practitioner; BNF, British National Formulary; GI, gastrointestinal; GORD, gastro-oesophageal reflux disease; COPD, chronic obstructive pulmonary disease; CKD, chronic kidney disease.

**Table S3 - Association between PPI prescription and mortality among PPI and H2RA users without weighting, with propensity score weighting, and with high-dimensional propensity score weighting**

| Cause of death  | PPI users/H2RA users |           |             |           |                  |           |
|---|----------------------|-----------|-------------|-----------|------------------|-----------|
|   | Unweighted HR        |           | Weighted HR |           | HDPS Weighted HR |           |
|   | HR                   | 95% CI    | HR          | 95% CI    | HR               | 95% CI    |
| <b>Top-level causes</b>                                 |                      |           |             |           |                  |           |
| All cause   | 1.65                 | 1.62-1.69 | 1.38        | 1.33-1.44 | 1.31             | 1.26-1.37 |
| Communicable diseases                                   | 1.48                 | 1.36-1.61 | 1.40        | 1.22-1.60 | 1.39             | 1.20-1.60 |
| Non-communicable diseases                               | 1.67                 | 1.64-1.71 | 1.39        | 1.34-1.45 | 1.32             | 1.27-1.38 |
| Injuries/external                                       | 1.29                 | 1.13-1.48 | 1.00        | 0.78-1.26 | 0.94             | 0.74-1.20 |
| <b>Second-level outcomes</b>                            |                      |           |             |           |                  |           |
| Neoplasms   | 1.98                 | 1.91-2.05 | 1.74        | 1.63-1.86 | 1.62             | 1.50-1.74 |
| Cardiovascular/circulatory                              | 1.33                 | 1.28-1.38 | 1.17        | 1.10-1.25 | 1.14             | 1.07-1.22 |
| Chronic respiratory diseases                            | 1.84                 | 1.69-2.00 | 1.40        | 1.22-1.62 | 1.33             | 1.14-1.55 |
| Liver cirrhosis   | 2.79                 | 1.98-3.92 | 1.95        | 1.10-3.46 | 1.90             | 1.01-3.56 |
| Digestive other than cirrhosis                          | 1.85                 | 1.66-2.07 | 1.43        | 1.20-1.69 | 1.39             | 1.12-1.74 |
| Neurological  | 1.43                 | 1.25-1.64 | 0.92        | 0.68-1.24 | 0.78             | 0.53-1.15 |
| Mental and behavioural                                  | 1.99                 | 1.73-2.29 | 1.00        | 0.78-1.27 | 0.87             | 0.67-1.13 |
| Diabetes, urogenital, blood and endocrine               | 1.75                 | 1.55-1.99 | 1.27        | 1.06-1.51 | 1.23             | 1.01-1.48 |
| Musculoskeletal   | 1.55                 | 1.21-1.99 | 1.29        | 0.88-1.89 | 1.03             | 0.67-1.57 |
| <b>Individual causes that been associated with PPIs</b> |                      |           |             |           |                  |           |
| Pneumonia   | 1.34                 | 1.22-1.47 | 1.31        | 1.12-1.52 | 1.31             | 1.11-1.54 |
| Acute kidney injury                                     | 2.75                 | 1.21-6.26 | 2.29        | 0.87-6.02 | 2.61             | 0.95-7.17 |
| <i>C. difficile</i> enterocolitis                       | 2.22                 | 1.40-3.53 | 1.62        | 0.83-3.14 | 1.57             | 0.73-3.35 |
| Atrial fibrillation/flutter                             | 1.76                 | 1.35-2.29 | 1.25        | 0.87-1.79 | 1.04             | 0.68-1.57 |
| Heart failure   | 1.48                 | 1.24-1.76 | 1.33        | 1.02-1.72 | 1.25             | 0.94-1.67 |
| Aortic aneurysm   | 1.19                 | 1.00-1.42 | 1.10        | 0.75-1.63 | 1.03             | 0.67-1.59 |
| Dementia and Alzheimer's                                | 1.85                 | 1.63-2.10 | 0.94        | 0.75-1.17 | 0.85             | 0.68-1.08 |
| Chronic kidney disease                                  | 1.45                 | 0.99-2.13 | 1.59        | 0.97-2.62 | 1.63             | 0.93-2.84 |
| Hypertensive heart disease                              | 1.15                 | 0.86-1.54 | 0.69        | 0.46-1.03 | 0.58             | 0.34-1.00 |
| Ischaemic heart disease                                 | 1.27                 | 1.20-1.34 | 1.22        | 1.12-1.34 | 1.21             | 1.10-1.33 |
| Lung cancer   | 2.23                 | 2.04-2.43 | 2.06        | 1.76-2.42 | 1.89             | 1.63-2.20 |
| Mesothelioma  | 2.66                 | 1.93-3.66 | 1.79        | 1.04-3.09 | 1.60             | 1.00-2.57 |
| Breast cancer   | 1.84                 | 1.62-2.09 | 2.02        | 1.62-2.51 | 1.83             | 1.45-2.31 |
| Liver cancer  | 2.92                 | 2.16-3.94 | 1.65        | 1.03-2.66 | 1.98             | 1.23-3.19 |

|                               |      |           |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|------|-----------|
| Prostate cancer               | 2.19 | 1.89-2.54 | 1.65 | 1.29-2.11 | 1.42 | 1.03-1.96 |
| Gastric cancer                | 2.84 | 2.29-3.53 | 2.35 | 1.39-3.99 | 2.71 | 1.73-4.23 |
| Alcoholic liver disease       | 3.70 | 2.69-5.10 | 2.96 | 1.70-5.14 | 2.93 | 1.59-5.39 |
| COPD                          | 1.83 | 1.64-2.03 | 1.37 | 1.14-1.66 | 1.34 | 1.11-1.61 |
| <b>Control outcomes</b>       |      |           |      |           |      |           |
| Accidental trauma excl. falls | 1.33 | 1.08-1.64 | 1.05 | 0.69-1.59 | 1.07 | 0.72-1.59 |
| Pulmonary embolism            | 1.36 | 1.01-1.81 | 1.33 | 0.85-2.09 | 1.50 | 0.98-2.31 |

Abbreviations: HR, hazard ratio; HDPS, high-dimensional propensity score; COPD, Chronic Obstructive Pulmonary Disease.



\* Average effect of treatment in the treated (ATT) weights were used. These weights were calculated using a propensity score estimated with investigator-chosen covariates.

**Figure S1: Weighted\* cumulative hazard curve for all-cause mortality among PPI and H2RA users**

***Table S4 - Association between PPI prescription and mortality among PPI and non-users with and without propensity score weighting***

| Cause of death  | Unweighted HR |             | Weighted HR |             |
|---|---------------|-------------|-------------|-------------|
|   | HR            | 95% CI      | HR          | 95% CI      |
| <b>Top-level causes</b>                                 |               |             |             |             |
| All cause   | 2.55          | 2.52-2.58   | 1.96        | 1.94-1.99   |
| Communicable diseases                                   | 1.70          | 1.62-1.79   | 1.49        | 1.42-1.56   |
| Non-communicable diseases                               | 2.59          | 2.56-2.62   | 1.99        | 1.96-2.02   |
| Injuries/external                                       | 1.58          | 1.47-1.70   | 1.26        | 1.17-1.35   |
| <b>Second-level outcomes</b>                            |               |             |             |             |
| Neoplasms   | 5.74          | 5.61-5.88   | 3.74        | 3.64-3.84   |
| Cardiovascular/Circulatory                              | 1.63          | 1.59-1.66   | 1.36        | 1.33-1.39   |
| Chronic respiratory diseases                            | 2.29          | 2.19-2.39   | 1.46        | 1.40-1.53   |
| Liver cirrhosis   | 5.35          | 4.51-6.34   | 4.10        | 3.36-5.01   |
| Digestive other than cirrhosis                          | 2.58          | 2.44-2.73   | 1.88        | 1.78-2.00   |
| Neurological  | 1.13          | 1.05-1.20   | 1.16        | 1.08-1.24   |
| Mental and behavioural                                  | 0.83          | 0.78-0.89   | 1.07        | 1.00-1.15   |
| Diabetes, urogenital, blood and endocrine               | 2.23          | 2.08-2.38   | 1.60        | 1.50-1.71   |
| Musculoskeletal   | 2.32          | 2.01-2.68   | 1.56        | 1.35-1.80   |
| <b>Individual causes that been associated with PPIs</b> |               |             |             |             |
| Pneumonia   | 1.58          | 1.49-1.66   | 1.44        | 1.37-1.53   |
| Acute kidney injury                                     | 2.48          | 1.70-3.63   | 1.56        | 1.10-2.21   |
| <i>C. difficile</i> enterocolitis                       | 2.76          | 2.19-3.48   | 2.16        | 1.71-2.74   |
| Atrial fibrillation/flutter                             | 1.57          | 1.35-1.82   | 1.54        | 1.32-1.79   |
| Heart failure   | 2.20          | 1.98-2.45   | 1.87        | 1.67-2.10   |
| Aortic aneurysm   | 1.24          | 1.13-1.36   | 1.06        | 0.97-1.16   |
| Dementia and Alzheimer's                                | 0.74          | 0.70-0.79   | 1.03        | 0.96-1.09   |
| Chronic kidney disease                                  | 2.84          | 2.22-3.64   | 2.11        | 1.64-2.71   |
| Hypertensive heart disease                              | 1.27          | 1.08-1.51   | 1.02        | 0.87-1.19   |
| Ischaemic heart disease                                 | 1.73          | 1.68-1.79   | 1.35        | 1.31-1.39   |
| Lung cancer   | 5.28          | 5.02-5.55   | 3.16        | 2.98-3.34   |
| Mesothelioma  | 6.98          | 5.80-8.40   | 3.62        | 2.91-4.50   |
| Breast cancer   | 5.51          | 5.09-5.97   | 2.80        | 2.57-3.04   |
| Liver cancer  | 6.08          | 5.15-7.18   | 4.72        | 3.83-5.82   |
| Prostate cancer   | 6.05          | 5.51-6.64   | 3.14        | 2.84-3.48   |
| Gastric cancer  | 15.10         | 12.79-17.82 | 14.59       | 11.16-19.08 |
| Alcoholic liver disease                                 | 5.32          | 4.65-6.10   | 3.24        | 2.80-3.75   |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| COPD                          | 2.19 | 2.07-2.31 | 1.29 | 1.22-1.35 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.61 | 1.44-1.80 | 1.28 | 1.15-1.43 |
| Pulmonary embolism            | 1.54 | 1.32-1.80 | 1.43 | 1.23-1.67 |

Abbreviations: HR, hazard ratio; COPD, Chronic Obstructive Pulmonary Disease.

***Table S5: Association between PPI prescription and mortality among PPI and H2RA users over up to 6 months, 1 year and 10 year follow-up after treatment initiation***

| Cause of death  | Weighted HR over 6 months |            | Weighted HR over 1 year |            | Weighted HR over 10 years |           |
|---|---------------------------|------------|-------------------------|------------|---------------------------|-----------|
|   | HR                        | 95% CI     | HR                      | 95% CI     | HR                        | 95% CI    |
| <b>Top-level causes</b>                                 |                           |            |                         |            |                           |           |
| All cause   | 1.34                      | 1.25-1.43  | 1.34                    | 1.27-1.42  | 1.38                      | 1.33-1.44 |
| Communicable diseases                                   | 1.34                      | 0.96-1.87  | 1.41                    | 1.09-1.83  | 1.42                      | 1.24-1.64 |
| Non-communicable diseases                               | 1.35                      | 1.26-1.45  | 1.36                    | 1.28-1.44  | 1.39                      | 1.34-1.45 |
| Injuries/external                                       | 0.68                      | 0.38-1.21  | 0.74                    | 0.48-1.14  | 1.02                      | 0.79-1.31 |
| <b>Second-level outcomes</b>                            |                           |            |                         |            |                           |           |
| Neoplasms   | 1.57                      | 1.43-1.72  | 1.60                    | 1.47-1.74  | 1.72                      | 1.61-1.84 |
| Cardiovascular/Circulatory                              | 1.10                      | 0.96-1.25  | 1.10                    | 0.98-1.23  | 1.17                      | 1.09-1.25 |
| Chronic respiratory diseases                            | 1.26                      | 0.86-1.83  | 1.26                    | 0.95-1.66  | 1.4                       | 1.21-1.62 |
| Liver cirrhosis   | 1.57                      | 0.51-4.91  | 1.58                    | 0.64-3.88  | 2.00                      | 1.11-3.62 |
| Digestive other than cirrhosis                          | 1.13                      | 0.79-1.62  | 1.22                    | 0.90-1.64  | 1.41                      | 1.18-1.67 |
| Neurological  | 1.01                      | 0.56-1.83  | 0.95                    | 0.62-1.45  | 0.92                      | 0.67-1.25 |
| Mental and behavioural                                  | 1.22                      | 0.71-2.11  | 1.02                    | 0.66-1.56  | 0.99                      | 0.77-1.28 |
| Diabetes, urogenital, blood and endocrine               | 1.04                      | 0.70-1.56  | 1.13                    | 0.82-1.55  | 1.28                      | 1.06-1.53 |
| Musculoskeletal   | 0.95                      | 0.45-2.00  | 0.83                    | 0.46-1.53  | 1.33                      | 0.89-1.98 |
| <b>Individual causes that been associated with PPIs</b> |                           |            |                         |            |                           |           |
| <b>Short term association plausible</b>                 |                           |            |                         |            |                           |           |
| Pneumonia   | 1.21                      | 0.84-1.76  | 1.24                    | 0.93-1.65  | 1.33                      | 1.14-1.55 |
| Acute kidney injury                                     | 1.04                      | 0.21-5.12  | 0.86                    | 0.24-3.06  | 2.21                      | 0.84-5.83 |
| <i>C. difficile</i> enterocolitis                       | 3.52                      | 0.93-13.37 | 4.12                    | 1.32-12.88 | 1.60                      | 0.82-3.15 |
| Atrial fibrillation/flutter                             | 4.27                      | 1.73-10.49 | 2.15                    | 1.01-4.58  | 1.37                      | 0.93-2.00 |
| Heart failure   | 1.15                      | 0.71-1.88  | 1.06                    | 0.68-1.66  | 1.31                      | 1.01-1.71 |
| Aortic aneurysm   | 1.65                      | 0.87-3.14  | 1.54                    | 0.92-2.57  | 1.07                      | 0.72-1.60 |
| COPD  | 1.13                      | 0.68-1.87  | 1.17                    | 0.80-1.70  | 1.36                      | 1.12-1.65 |
| <b>Short term association not expected</b>              |                           |            |                         |            |                           |           |
| Dementia and Alzheimer's                                | 1.03                      | 0.60-1.77  | 0.94                    | 0.62-1.41  | 0.93                      | 0.74-1.17 |
| Chronic kidney disease                                  | 1.25                      | 0.39-3.94  | 1.73                    | 0.61-4.92  | 1.62                      | 0.96-2.72 |
| Hypertensive heart disease                              | 0.81                      | 0.29-2.31  | 0.64                    | 0.29-1.43  | 0.71                      | 0.46-1.09 |
| Ischaemic heart disease                                 | 1.05                      | 0.88-1.26  | 1.11                    | 0.95-1.30  | 1.22                      | 1.11-1.34 |
| Lung cancer   | 1.77                      | 1.39-2.25  | 1.91                    | 1.55-2.35  | 2.06                      | 1.75-2.42 |
| Mesothelioma  | 1.54                      | 0.87-2.73  | 2.01                    | 1.15-3.50  | 1.77                      | 1.03-3.07 |
| Breast cancer   | 2.43                      | 1.75-3.36  | 1.98                    | 1.44-2.72  | 2.01                      | 1.61-2.51 |

|                               |      |            |      |            |      |           |
|-------------------------------|------|------------|------|------------|------|-----------|
| Liver cancer                  | 2.47 | 1.08-5.63  | 1.97 | 1.05-3.70  | 1.61 | 0.99-2.61 |
| Prostate cancer               | 1.38 | 0.92-2.07  | 1.42 | 1.01-2.01  | 1.64 | 1.27-2.11 |
| Gastric cancer                | 1.74 | 0.95-3.17  | 1.75 | 1.01-3.03  | 2.33 | 1.37-3.96 |
| Alcoholic liver disease       | 3.00 | 0.76-11.92 | 3.58 | 1.12-11.43 | 3.08 | 1.73-5.50 |
| <b>Control outcomes</b>       |      |            |      |            |      |           |
| Accidental trauma excl. falls | 0.69 | 0.25-1.90  | 0.86 | 0.42-1.78  | 1.08 | 0.70-1.68 |
| Pulmonary embolism            | 1.97 | 0.72-5.40  | 1.94 | 0.89-4.24  | 1.34 | 0.84-2.13 |

Abbreviations: HR, hazard ratio; COPD, Chronic Obstructive Pulmonary Disease.



**Table S6: Characteristics of matched and unmatched PPI users**

| Characteristic                                   | Unmatched PPI users | Matched PPI users |
|--|---------------------|-------------------|
| N  | 44,283              | 689,602           |
| Mean age in years                                | 76.3                | 53.6              |
| Mean BMI   | 26.8                | 27.2              |
| Mean calendar year                               | 2012.2              | 2008.2            |
| Female   | 58.59%              | 54.49%            |
| Current smoker                                   | 8.85%               | 20.27%            |
| High alcohol intake                              | 2.19%               | 3.45%             |
| Below national median IMD                        | 55.82%              | 51.56%            |
| <b>In 6 months prior to treatment initiation</b> |                     |                   |
| Mean number of hospital admissions               | 0.5                 | 0.4               |
| Mean number of GP appointments                   | 9.0                 | 5.7               |
| Mean number of BNF drug chapters                 | 3.5                 | 2.4               |
| NSAID  | 40.6%               | 31.5%             |
| Aspirin  | 30.3%               | 14.0%             |
| Clopidogrel                                      | 4.7%                | 1.9%              |
| Oral anticoagulant                               | 6.1%                | 2.1%              |
| Inhaled steroid                                  | 15.6%               | 12.7%             |
| Systemic steroid                                 | 10.7%               | 6.9%              |
| Upper GI bleed                                   | 0.1%                | 0.1%              |
| Gastric cancer                                   | 0.1%                | 0.1%              |
| GORD   | 5.0%                | 8.6%              |
| Peptic ulcer                                     | 1.0%                | 0.9%              |
| Upper GI endoscopy                               | 1.0%                | 1.3%              |
| Pancreatitis                                     | 0.2%                | 0.1%              |
| Cirrhosis  | 0.1%                | 0.1%              |
| Oesophagitis                                     | 1.9%                | 3.6%              |
| Barrett's oesophagus                             | 0.4%                | 0.2%              |
| H pylori infection                               | 0.7%                | 1.6%              |
| <b>Ever previous</b>                             |                     |                   |
| Hypertension                                     | 53.8%               | 24.4%             |
| Coronary Heart Disease                           | 15.2%               | 7.8%              |
| Heart failure                                    | 4.3%                | 1.8%              |
| Peripheral artery disease                        | 4.7%                | 2.0%              |
| Cerebrovascular disease                          | 11.0%               | 4.2%              |
| Other atherosclerosis                            | 0.2%                | 0.1%              |

|                         |       |       |
|-------------------------|-------|-------|
| COPD                    | 8.2%  | 3.3%  |
| Cancer                  | 22.8% | 9.3%  |
| Non-viral liver disease | 1.1%  | 1.0%  |
| HIV                     | 0.0%  | 0.1%  |
| CKD                     | 39.5% | 12.2% |
| Dementia                | 3.8%  | 0.7%  |
| Diabetes                | 14.0% | 7.3%  |

Abbreviations: PPI, proton pump inhibitor; BMI, body mass index; IMD, Index of Multiple Deprivation; GP, General Practitioner; BNF, British National Formulary; GI, gastrointestinal; GORD, gastro-oesophageal reflux disease; COPD, chronic obstructive pulmonary disease; CKD, chronic kidney disease.

***Table S7: Absolute standardised differences between matched PPI and non-users before and after weighting***

| Characteristic                                   | Unweighted |          | Weighted   |          | Unweighted ASD | Weighted ASD |
|--|------------|----------|------------|----------|----------------|--------------|
|  | Non-user   | PPI user | Non-user   | PPI user |                |              |
| Effective sample size                            | 1,361,245  | 689,602  | 744,078.80 | 689,602  |                |              |
| Mean age in years                                | 53.3       | 53.6     | 53.3       | 53.6     | 0.017          | 0.017        |
| Mean BMI   | 26.6       | 27.2     | 27.4       | 27.2     | 0.112          | 0.033        |
| Mean calendar year                               | 2008.1     | 2008.2   | 2007.9     | 2008.2   | 0.011          | 0.051        |
| Female   | 54.4%      | 54.5%    | 56.1%      | 54.5%    | 0.002          | 0.033        |
| Current smoker                                   | 18.3%      | 20.3%    | 21.1%      | 20.3%    | 0.049          | 0.019        |
| High alcohol intake                              | 2.3%       | 3.5%     | 3.7%       | 3.5%     | 0.061          | 0.012        |
| Below national median IMD                        | 53.3%      | 51.6%    | 50.2%      | 51.6%    | 0.034          | 0.027        |
| <b>In 6 months prior to treatment initiation</b> |            |          |            |          |                |              |
| Mean number of hospital admissions               | 0.1        | 0.4      | 0.5        | 0.4      | 0.194          | 0.048        |
| Mean number of GP appointments                   | 3.2        | 5.7      | 6.3        | 5.7      | 0.393          | 0.093        |
| Mean number of BNF drug chapters                 | 1.5        | 2.4      | 2.7        | 2.4      | 0.434          | 0.142        |
| NSAID  | 7.6%       | 31.5%    | 37.5%      | 31.5%    | 0.515          | 0.127        |
| Aspirin  | 8.3%       | 14.0%    | 14.7%      | 14.0%    | 0.166          | 0.019        |
| Clopidogrel                                      | 0.5%       | 1.9%     | 2.1%       | 1.9%     | 0.103          | 0.018        |
| Oral anticoagulant                               | 1.5%       | 2.1%     | 2.0%       | 2.1%     | 0.043          | 0.008        |
| Inhaled steroid                                  | 7.3%       | 12.7%    | 14.3%      | 12.7%    | 0.162          | 0.049        |
| Systemic steroid                                 | 2.0%       | 6.9%     | 8.3%       | 6.9%     | 0.195          | 0.054        |
| Upper GI bleed                                   | 1.0%       | 1.3%     | 1.5%       | 1.3%     | 0.031          | 0.014        |
| Gastric cancer                                   | 0.0%       | 0.1%     | 0.1%       | 0.1%     | 0.016          | 0.006        |
| GORD   | 1.6%       | 8.6%     | 12.2%      | 8.6%     | 0.251          | 0.127        |
| Peptic ulcer                                     | 0.8%       | 0.9%     | 0.9%       | 0.9%     | 0.014          | 0.001        |
| Upper GI endoscopy                               | 0.0%       | 0.1%     | 0.1%       | 0.1%     | 0.017          | 0.017        |
| Pancreatitis                                     | 0.2%       | 0.1%     | 0.1%       | 0.1%     | 0.018          | 0.001        |
| Cirrhosis  | 0.1%       | 0.1%     | 0.1%       | 0.1%     | 0.004          | 0.002        |
| Oesophagitis                                     | 0.7%       | 3.6%     | 5.0%       | 3.6%     | 0.154          | 0.072        |
| Barrett's oesophagus                             | 0.0%       | 0.2%     | 0.2%       | 0.2%     | 0.043          | 0.007        |
| H pylori infection                               | 0.0%       | 1.6%     | 0.1%       | 1.6%     | 0.125          | 0.122        |
| <b>Ever previous</b>                             |            |          |            |          |                |              |
| Hypertension                                     | 20.7%      | 24.4%    | 24.4%      | 24.4%    | 0.086          | 0.002        |
| Coronary Heart Disease                           | 4.6%       | 7.8%     | 8.4%       | 7.8%     | 0.121          | 0.021        |

|                           |      |       |       |       |       |        |
|---------------------------|------|-------|-------|-------|-------|--------|
| Heart failure             | 1.1% | 1.8%  | 1.9%  | 1.8%  | 0.056 | 0.005  |
| Peripheral artery disease | 1.2% | 2.0%  | 2.1%  | 2.0%  | 0.057 | 0.007  |
| Cerebrovascular disease   | 2.8% | 4.2%  | 4.4%  | 4.2%  | 0.068 | 0.012  |
| Other atherosclerosis     | 0.1% | 0.1%  | 0.1%  | 0.1%  | 0.01  | <0.001 |
| COPD                      | 2.0% | 3.3%  | 3.6%  | 3.3%  | 0.074 | 0.017  |
| Cancer                    | 6.2% | 9.3%  | 9.2%  | 9.3%  | 0.108 | 0.003  |
| Non-viral liver disease   | 0.6% | 1.0%  | 1.1%  | 1.0%  | 0.046 | 0.005  |
| HIV                       | 0.1% | 0.1%  | 0.1%  | 0.1%  | 0.002 | 0.001  |
| CKD                       | 8.8% | 12.2% | 12.5% | 12.2% | 0.103 | 0.008  |
| Dementia                  | 1.1% | 0.7%  | 0.7%  | 0.7%  | 0.043 | <0.001 |
| Diabetes                  | 5.5% | 7.3%  | 7.4%  | 7.3%  | 0.069 | 0.003  |

Abbreviations: ASD, absolute standardised difference; H2RA, H2 receptor antagonist; PPI, proton pump inhibitor; BMI, body mass index; IMD, Index of Multiple Deprivation; GP, General Practitioner; BNF, British National Formulary; GI, gastrointestinal; GORD, gastro-oesophageal reflux disease; COPD, chronic obstructive pulmonary disease; CKD, chronic kidney disease.

**Table S8 - Association between PPI prescription and mortality among PPI and H2RA users with Cox model adjustment of covariates**

| Cause of death  | Unadjusted HR |           | Adjusted HR |           |
|---|---------------|-----------|-------------|-----------|
|   | HR            | 95% CI    | HR          | 95% CI    |
| <b>Top-level causes</b>                                 |               |           |             |           |
| All cause   | 1.65          | 1.62-1.69 | 1.39        | 1.35-1.42 |
| Communicable diseases                                   | 1.48          | 1.36-1.61 | 1.18        | 1.08-1.29 |
| Non-communicable diseases                               | 1.67          | 1.64-1.71 | 1.40        | 1.37-1.43 |
| Injuries/external                                       | 1.29          | 1.13-1.48 | 1.10        | 0.96-1.27 |
| <b>Second-level outcomes</b>                            |               |           |             |           |
| Neoplasms   | 1.98          | 1.91-2.05 | 1.77        | 1.70-1.84 |
| Cardiovascular/circulatory                              | 1.33          | 1.28-1.38 | 1.13        | 1.09-1.18 |
| Chronic respiratory diseases                            | 1.84          | 1.69-2.00 | 1.36        | 1.25-1.49 |
| Liver cirrhosis   | 2.79          | 1.98-3.92 | 1.79        | 1.26-2.55 |
| Digestive other than cirrhosis                          | 1.85          | 1.66-2.07 | 1.48        | 1.32-1.66 |
| Neurological  | 1.43          | 1.25-1.64 | 1.04        | 0.91-1.20 |
| Mental and behavioural                                  | 1.99          | 1.73-2.29 | 1.16        | 1.00-1.34 |
| Diabetes, urogenital, blood and endocrine               | 1.75          | 1.55-1.99 | 1.34        | 1.18-1.53 |
| Musculoskeletal   | 1.55          | 1.21-1.99 | 1.29        | 0.99-1.67 |
| <b>Individual causes that been associated with PPIs</b> |               |           |             |           |
| Pneumonia   | 1.34          | 1.22-1.47 | 1.11        | 1.00-1.22 |
| Acute kidney injury                                     | 2.75          | 1.21-6.26 | 1.84        | 0.79-4.28 |
| <i>C. difficile</i> enterocolitis                       | 2.22          | 1.40-3.53 | 1.90        | 1.17-3.06 |
| Atrial fibrillation/flutter                             | 1.76          | 1.35-2.29 | 1.17        | 0.89-1.55 |
| Heart failure   | 1.48          | 1.24-1.76 | 1.28        | 1.06-1.54 |
| Aortic aneurysm   | 1.19          | 1.00-1.42 | 1.07        | 0.89-1.29 |
| Dementia and Alzheimer's                                | 1.85          | 1.63-2.10 | 1.06        | 0.94-1.21 |
| Chronic kidney disease                                  | 1.45          | 0.99-2.13 | 1.10        | 0.74-1.64 |
| Hypertensive heart disease                              | 1.15          | 0.86-1.54 | 0.76        | 0.56-1.03 |
| Ischaemic heart disease                                 | 1.27          | 1.20-1.34 | 1.12        | 1.06-1.19 |
| Lung cancer   | 2.23          | 2.04-2.43 | 1.89        | 1.72-2.06 |
| Mesothelioma  | 2.66          | 1.93-3.66 | 2.16        | 1.55-3.00 |
| Breast cancer   | 1.84          | 1.62-2.09 | 1.78        | 1.56-2.03 |
| Liver cancer  | 2.92          | 2.16-3.94 | 2.09        | 1.53-2.84 |
| Prostate cancer   | 2.19          | 1.89-2.54 | 1.88        | 1.62-2.19 |
| Gastric cancer  | 2.84          | 2.29-3.53 | 2.74        | 2.19-3.42 |
| Alcoholic liver disease                                 | 3.70          | 2.69-5.10 | 2.49        | 1.79-3.46 |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| COPD                          | 1.83 | 1.64-2.03 | 1.29 | 1.16-1.44 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.33 | 1.08-1.64 | 1.16 | 0.93-1.44 |
| Pulmonary embolism            | 1.36 | 1.01-1.81 | 1.20 | 0.88-1.62 |

Abbreviations: HR, hazard ratio; COPD, Chronic Obstructive Pulmonary Disease.

***Table S9 - Associations between covariates and all-cause mortality among PPI and H2RA users with Cox model adjustment for covariates***

| Characteristic                                   | Adjusted HR* | 95% CI      |
|--|--------------|-------------|
| PPI exposure                                     | 1.46         | (1.42-1.49) |
| Age in years                                     | 1.07         | (1.07-1.07) |
| BMI  |              |             |
| 18.5 ≥ X < 25                                    | 1 (REF)      |             |
| < 18.5   | 1.71         | (1.66-1.76) |
| ≥ 25   | 0.82         | (0.81-0.83) |
| Missing  | 1.65         | (1.61-1.69) |
| Calendar year                                    |              |             |
| 1998-2003  | 1 (REF)      |             |
| 2004-2009  | 0.83         | (0.82-0.85) |
| 2010-2015  | 0.64         | (0.63-0.66) |
| Female   | 0.73         | (0.72-0.74) |
| Smoking  |              |             |
| Non-smoker                                       | 1 (REF)      |             |
| Current smoker                                   | 1.77         | (1.73-1.80) |
| Current or ex-smoker                             | 1.53         | (1.47-1.59) |
| Ex-smoker  | 1.14         | (1.12-1.15) |
| Missing  | 2.30         | (2.21-2.39) |
| Alcohol consumption                              |              |             |
| None   | 1 (REF)      |             |
| Low  | 0.93         | (0.90-0.96) |
| Medium   | 1.01         | (0.97-1.05) |
| High   | 1.58         | (1.51-1.65) |
| Missing  | 0.95         | (0.92-0.98) |
| Below national median IMD                        | 1.18         | (1.16-1.19) |
| <b>In 6 months prior to treatment initiation</b> |              |             |
| Number of hospital admissions                    | 1.04         | (1.04-1.04) |
| Number of GP appointments                        | 1.02         | (1.02-1.02) |
| Number of BNF drug chapters                      | 1.08         | (1.08-1.09) |
| NSAID  | 0.84         | (0.83-0.86) |
| Aspirin  | 0.98         | (0.96-0.99) |
| Clopidogrel                                      | 0.96         | (0.93-0.99) |
| Oral anticoagulant                               | 1.14         | (1.11-1.17) |
| Inhaled steroid                                  | 0.82         | (0.80-0.84) |

|                           |      |             |
|---------------------------|------|-------------|
| Systemic steroid          | 1.66 | (1.64-1.69) |
| Upper GI bleed            | 1.07 | (1.03-1.12) |
| Gastric cancer            | 2.78 | (2.48-3.11) |
| GORD                      | 0.71 | (0.68-0.74) |
| Peptic ulcer              | 1.09 | (1.04-1.14) |
| Upper GI endoscopy        | 0.95 | (0.81-1.12) |
| Pancreatitis              | 0.96 | (0.84-1.10) |
| Cirrhosis                 | 2.35 | (2.08-2.65) |
| Oesophagitis              | 1.10 | (1.05-1.16) |
| Barrett's oesophagus      | 1.22 | (1.10-1.34) |
| H pylori infection        | 0.78 | (0.73-0.82) |
| <b>Ever previous</b>      |      |             |
| Hypertension              | 0.99 | (0.98-1.00) |
| Coronary Heart Disease    | 1.05 | (1.03-1.06) |
| Heart failure             | 1.41 | (1.38-1.45) |
| Peripheral artery disease | 1.26 | (1.23-1.29) |
| Cerebrovascular disease   | 1.21 | (1.18-1.23) |
| Other atherosclerosis     | 0.94 | (0.83-1.05) |
| COPD                      | 1.42 | (1.39-1.46) |
| Cancer                    | 2.22 | (2.19-2.25) |
| Non-viral liver disease   | 1.58 | (1.50-1.66) |
| HIV                       | 1.18 | (0.78-1.77) |
| CKD                       | 1.10 | (1.08-1.12) |
| Dementia                  | 1.64 | (1.58-1.69) |
| Diabetes                  | 1.22 | (1.20-1.25) |

\* For ease of interpretation these hazard ratios were generated from a simplified Cox models without splines or interactions and with categorical variables with a large number of categories (IMD, no. of GP appointments, no. of BNF chapters, no. of hospital admissions) replaced by continuous or binary variables. Abbreviations: PPI, proton pump inhibitor; BMI, body mass index; IMD, Index of Multiple Deprivation; GP, General Practitioner; BNF, British National Formulary; GI, gastrointestinal; GORD, gastro-oesophageal reflux disease; COPD, chronic obstructive pulmonary disease; CKD, chronic kidney disease.



**Table S10 - Association between PPI prescription and mortality among PPI and H2RA users censoring follow-up at prescription of a H2RA among PPI users**

| Cause of death  | Unweighted HR |           | Weighted HR |           |
|---|---------------|-----------|-------------|-----------|
|   | HR            | 95% CI    | HR          | 95% CI    |
| <b>Top-level causes</b>                                 |               |           |             |           |
| All cause   | 1.62          | 1.58-1.65 | 1.36        | 1.31-1.41 |
| Communicable diseases                                   | 1.46          | 1.35-1.59 | 1.39        | 1.21-1.59 |
| Non-communicable diseases                               | 1.64          | 1.60-1.68 | 1.37        | 1.32-1.42 |
| Injuries/external                                       | 1.28          | 1.12-1.46 | 0.99        | 0.78-1.25 |
| <b>Second-level outcomes</b>                            |               |           |             |           |
| Neoplasms   | 1.92          | 1.85-1.99 | 1.69        | 1.58-1.80 |
| Cardiovascular/circulatory                              | 1.31          | 1.26-1.36 | 1.16        | 1.08-1.23 |
| Chronic respiratory diseases                            | 1.80          | 1.65-1.96 | 1.38        | 1.19-1.59 |
| Liver cirrhosis   | 2.76          | 1.96-3.88 | 1.94        | 1.09-3.44 |
| Digestive other than cirrhosis                          | 1.81          | 1.62-2.03 | 1.40        | 1.18-1.67 |
| Neurological  | 1.43          | 1.25-1.63 | 0.91        | 0.68-1.24 |
| Mental and behavioural                                  | 1.98          | 1.72-2.28 | 1.00        | 0.78-1.27 |
| Diabetes, urogenital, blood and endocrine               | 1.73          | 1.53-1.96 | 1.25        | 1.05-1.50 |
| Musculoskeletal   | 1.53          | 1.19-1.96 | 1.27        | 0.87-1.87 |
| <b>Individual causes that been associated with PPIs</b> |               |           |             |           |
| Pneumonia   | 1.33          | 1.22-1.46 | 1.30        | 1.12-1.51 |
| Acute kidney injury                                     | 2.68          | 1.18-6.12 | 2.24        | 0.85-5.94 |
| <i>C. difficile</i> enterocolitis                       | 2.20          | 1.38-3.50 | 1.60        | 0.82-3.13 |
| Atrial fibrillation/flutter                             | 1.74          | 1.33-2.28 | 1.24        | 0.87-1.78 |
| Heart failure   | 1.45          | 1.22-1.74 | 1.31        | 1.01-1.70 |
| Aortic aneurysm   | 1.19          | 0.99-1.42 | 1.11        | 0.75-1.64 |
| Dementia and Alzheimer's                                | 1.85          | 1.63-2.10 | 0.94        | 0.76-1.17 |
| Chronic kidney disease                                  | 1.40          | 0.95-2.06 | 1.54        | 0.93-2.54 |
| Hypertensive heart disease                              | 1.16          | 0.86-1.55 | 0.69        | 0.46-1.04 |
| Ischaemic heart disease                                 | 1.25          | 1.18-1.32 | 1.20        | 1.10-1.32 |
| Lung cancer   | 2.19          | 2.01-2.39 | 2.03        | 1.73-2.38 |
| Mesothelioma  | 2.58          | 1.87-3.55 | 1.74        | 1.01-3.00 |
| Breast cancer   | 1.81          | 1.60-2.06 | 1.99        | 1.60-2.48 |
| Liver cancer  | 2.81          | 2.08-3.80 | 1.60        | 0.99-2.58 |
| Prostate cancer   | 2.15          | 1.86-2.50 | 1.62        | 1.27-2.08 |
| Gastric cancer  | 2.70          | 2.17-3.35 | 2.24        | 1.32-3.79 |
| Alcoholic liver disease                                 | 3.73          | 2.71-5.14 | 2.97        | 1.71-5.17 |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| COPD                          | 1.79 | 1.61-1.99 | 1.35 | 1.11-1.63 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.31 | 1.06-1.61 | 1.04 | 0.68-1.58 |
| Pulmonary embolism            | 1.33 | 0.99-1.77 | 1.32 | 0.84-2.07 |

Abbreviations: HR, hazard ratio; COPD, Chronic Obstructive Pulmonary Disease.

**Table S11 - Association between PPI prescription and mortality among PPI and H2RA users censoring follow-up at first treatment break**

| Cause of death  | Unweighted HR |            | Weighted HR |            |
|---|---------------|------------|-------------|------------|
|   | HR            | 95% CI     | HR          | 95% CI     |
| <b>Top-level causes</b>                                 |               |            |             |            |
| All cause   | 1.28          | 1.22-1.33  | 1.12        | 1.04-1.20  |
| Communicable diseases                                   | 1.01          | 0.85-1.20  | 1.19        | 0.91-1.55  |
| Non-communicable diseases                               | 1.29          | 1.24-1.35  | 1.12        | 1.04-1.21  |
| Injuries/external                                       | 1.31          | 0.85-2.01  | 0.68        | 0.37-1.26  |
| <b>Second-level outcomes</b>                            |               |            |             |            |
| Neoplasms   | 1.47          | 1.38-1.56  | 1.35        | 1.21-1.52  |
| Cardiovascular/Circulatory                              | 1.05          | 0.96-1.14  | 0.97        | 0.86-1.10  |
| Chronic respiratory diseases                            | 1.36          | 1.12-1.65  | 1.08        | 0.81-1.43  |
| Liver cirrhosis   | 2.22          | 1.04-4.76  | 1.62        | 0.35-7.44  |
| Digestive other than cirrhosis                          | 1.31          | 1.04-1.65  | 1.07        | 0.76-1.51  |
| Neurological  | 0.93          | 0.72-1.20  | 0.51        | 0.27-0.95  |
| Mental and behavioural                                  | 1.55          | 1.16-2.07  | 0.79        | 0.52-1.22  |
| Diabetes, urogenital, blood and endocrine               | 1.35          | 1.03-1.77  | 1.08        | 0.75-1.58  |
| Musculoskeletal   | 1.65          | 0.84-3.25  | 1.39        | 0.60-3.25  |
| <b>Individual causes that been associated with PPIs</b> |               |            |             |            |
| Pneumonia   | 0.89          | 0.75-1.07  | 1.10        | 0.83-1.46  |
| Acute kidney injury                                     | 1.53          | 0.36-6.44  | 1.34        | 0.31-5.74  |
| <i>C. difficile</i> enterocolitis                       | 3.31          | 0.81-13.56 | 8.26        | 1.98-34.44 |
| Atrial fibrillation/flutter                             | 1.14          | 0.64-2.02  | 1.05        | 0.47-2.35  |
| Heart failure   | 1.05          | 0.73-1.50  | 0.97        | 0.58-1.62  |
| Aortic aneurysm   | 1.19          | 0.74-1.91  | 1.19        | 0.63-2.26  |
| Dementia and Alzheimer's                                | 1.30          | 1.02-1.65  | 0.70        | 0.48-1.03  |
| Chronic kidney disease                                  | 1.08          | 0.47-2.52  | 1.11        | 0.38-3.21  |
| Hypertensive heart disease                              | 0.75          | 0.41-1.39  | 0.31        | 0.14-0.68  |
| Ischaemic heart disease                                 | 1.00          | 0.89-1.13  | 1.01        | 0.85-1.21  |
| Lung cancer   | 1.84          | 1.59-2.12  | 1.57        | 1.20-2.04  |
| Mesothelioma  | 1.62          | 1.02-2.59  | 1.19        | 0.66-2.13  |
| Breast cancer   | 1.68          | 1.33-2.13  | 2.17        | 1.43-3.28  |
| Liver cancer  | 3.11          | 1.65-5.87  | 1.87        | 0.79-4.39  |
| Prostate cancer   | 1.40          | 1.09-1.78  | 1.26        | 0.84-1.90  |
| Gastric cancer  | 1.61          | 1.15-2.25  | 1.59        | 0.84-3.01  |
| Alcoholic liver disease                                 | 3.82          | 1.57-9.32  | 1.29        | 0.37-4.48  |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| COPD                          | 1.41 | 1.09-1.82 | 1.07 | 0.71-1.60 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.20 | 0.63-2.29 | 0.79 | 0.29-2.20 |
| Pulmonary embolism            | 1.47 | 0.74-2.90 | 2.41 | 0.80-7.27 |

Abbreviations: HR, hazard ratio; COPD, Chronic Obstructive Pulmonary Disease.

**Table S12 - Association between PPI prescription and mortality among PPI and H2RA users censoring follow-up at 31<sup>st</sup> December 2014**

| Cause of death  | Unweighted HR |           | Weighted HR |           |
|---|---------------|-----------|-------------|-----------|
|   | HR            | 95% CI    | HR          | 95% CI    |
| <b>Top-level causes</b>                                 |               |           |             |           |
| All cause   | 1.70          | 1.66-1.74 | 1.41        | 1.36-1.47 |
| Communicable diseases                                   | 1.50          | 1.38-1.64 | 1.45        | 1.26-1.66 |
| Non-communicable diseases                               | 1.73          | 1.69-1.77 | 1.42        | 1.37-1.48 |
| Injuries/external                                       | 1.31          | 1.14-1.50 | 1.05        | 0.83-1.32 |
| <b>Second-level outcomes</b>                            |               |           |             |           |
| Neoplasms   | 2.02          | 1.95-2.10 | 1.76        | 1.65-1.88 |
| Cardiovascular/Circulatory                              | 1.39          | 1.34-1.44 | 1.19        | 1.11-1.27 |
| Chronic respiratory diseases                            | 1.90          | 1.74-2.07 | 1.43        | 1.24-1.65 |
| Liver cirrhosis   | 2.85          | 2.02-4.03 | 1.93        | 1.07-3.48 |
| Digestive other than cirrhosis                          | 1.90          | 1.70-2.13 | 1.42        | 1.19-1.68 |
| Neurological  | 1.46          | 1.27-1.68 | 0.93        | 0.67-1.29 |
| Mental and behavioural                                  | 1.91          | 1.65-2.21 | 0.97        | 0.75-1.24 |
| Diabetes, urogenital, blood and endocrine               | 1.87          | 1.64-2.12 | 1.32        | 1.10-1.59 |
| Musculoskeletal   | 1.70          | 1.31-2.20 | 1.36        | 0.90-2.03 |
| <b>Individual causes that been associated with PPIs</b> |               |           |             |           |
| Pneumonia   | 1.37          | 1.25-1.51 | 1.37        | 1.18-1.60 |
| Acute kidney injury                                     | 2.78          | 1.22-6.34 | 2.14        | 0.81-5.65 |
| <i>C. difficile</i> enterocolitis                       | 2.27          | 1.42-3.62 | 1.55        | 0.80-3.02 |
| Atrial fibrillation/flutter                             | 1.84          | 1.39-2.44 | 1.37        | 0.94-1.99 |
| Heart failure   | 1.51          | 1.26-1.80 | 1.26        | 0.97-1.64 |
| Aortic aneurysm   | 1.24          | 1.03-1.48 | 1.12        | 0.74-1.69 |
| Dementia and Alzheimer's                                | 1.79          | 1.57-2.04 | 0.91        | 0.72-1.15 |
| Chronic kidney disease                                  | 1.48          | 0.99-2.20 | 1.68        | 0.99-2.85 |
| Hypertensive heart disease                              | 1.17          | 0.87-1.58 | 0.66        | 0.43-1.02 |
| Ischaemic heart disease                                 | 1.33          | 1.26-1.41 | 1.22        | 1.11-1.34 |
| Lung cancer   | 2.27          | 2.08-2.48 | 2.10        | 1.79-2.46 |
| Mesothelioma  | 2.66          | 1.92-3.67 | 1.80        | 1.02-3.19 |
| Breast cancer   | 1.87          | 1.65-2.13 | 2.02        | 1.61-2.53 |
| Liver cancer  | 3.02          | 2.21-4.12 | 1.84        | 1.14-2.98 |
| Prostate cancer   | 2.24          | 1.93-2.61 | 1.62        | 1.25-2.09 |
| Gastric cancer  | 2.98          | 2.39-3.72 | 2.96        | 1.74-5.02 |
| Alcoholic liver disease                                 | 3.78          | 2.73-5.23 | 2.90        | 1.63-5.13 |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| COPD                          | 1.87 | 1.68-2.09 | 1.43 | 1.18-1.73 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.40 | 1.13-1.74 | 1.24 | 0.87-1.77 |
| Pulmonary embolism            | 1.39 | 1.03-1.86 | 1.26 | 0.80-1.98 |

Abbreviations: HR, hazard ratio; COPD, Chronic Obstructive Pulmonary Disease.

***Table S13 - Association between PPI prescription and mortality among PPI and H2RA users with cause of death defined based on any rather than primary cause recorded***

| Cause of death  | Unweighted HR |           | Weighted HR |           |
|---|---------------|-----------|-------------|-----------|
|   | HR            | 95% CI    | HR          | 95% CI    |
| <b>Top-level causes</b>                                 |               |           |             |           |
| All cause   | 1.65          | 1.62-1.69 | 1.38        | 1.33-1.44 |
| Communicable diseases                                   | 1.68          | 1.61-1.76 | 1.30        | 1.21-1.41 |
| Non-communicable diseases                               | 1.67          | 1.63-1.70 | 1.39        | 1.34-1.44 |
| Injuries/external                                       | 1.48          | 1.36-1.60 | 1.15        | 1.01-1.31 |
| <b>Second-level outcomes</b>                            |               |           |             |           |
| Neoplasms   | 1.96          | 1.89-2.03 | 1.70        | 1.60-1.81 |
| Cardiovascular/Circulatory                              | 1.54          | 1.49-1.59 | 1.24        | 1.17-1.32 |
| Chronic respiratory diseases                            | 1.86          | 1.75-1.97 | 1.42        | 1.29-1.56 |
| Liver cirrhosis   | 2.77          | 2.13-3.59 | 1.84        | 1.24-2.73 |
| Digestive other than cirrhosis                          | 1.90          | 1.75-2.05 | 1.49        | 1.30-1.71 |
| Neurological  | 1.50          | 1.36-1.66 | 0.98        | 0.81-1.20 |
| Mental and behavioural                                  | 1.88          | 1.71-2.06 | 1.12        | 0.96-1.32 |
| Diabetes, urogenital, blood and endocrine               | 1.96          | 1.85-2.07 | 1.27        | 1.16-1.39 |
| Musculoskeletal   | 1.79          | 1.54-2.08 | 1.30        | 1.02-1.65 |
| <b>Individual causes that been associated with PPIs</b> |               |           |             |           |
| Pneumonia   | 1.59          | 1.51-1.67 | 1.30        | 1.20-1.41 |
| Acute kidney injury                                     | 2.13          | 1.80-2.52 | 1.24        | 0.98-1.56 |
| <i>C. difficile</i> enterocolitis                       | 1.97          | 1.45-2.67 | 1.94        | 1.23-3.07 |
| Atrial fibrillation/flutter                             | 1.98          | 1.76-2.22 | 1.14        | 0.92-1.42 |
| Heart failure   | 1.59          | 1.49-1.70 | 1.38        | 1.25-1.52 |
| Aortic aneurysm   | 1.25          | 1.07-1.48 | 1.16        | 0.82-1.62 |
| Dementia and Alzheimer's                                | 1.79          | 1.64-1.96 | 0.97        | 0.83-1.14 |
| Chronic kidney disease                                  | 1.93          | 1.70-2.19 | 1.32        | 1.11-1.57 |
| Hypertensive heart disease                              | 1.31          | 1.09-1.57 | 0.90        | 0.69-1.18 |
| Ischaemic heart disease                                 | 1.45          | 1.39-1.52 | 1.24        | 1.14-1.34 |
| Lung cancer   | 2.22          | 2.04-2.42 | 2.03        | 1.75-2.37 |
| Mesothelioma  | 2.61          | 1.92-3.57 | 1.83        | 1.07-3.13 |
| Breast cancer   | 1.81          | 1.61-2.04 | 1.65        | 1.29-2.11 |
| Liver cancer  | 2.84          | 2.14-3.78 | 1.71        | 1.09-2.71 |
| Prostate cancer   | 2.11          | 1.86-2.40 | 1.58        | 1.29-1.95 |
| Gastric cancer  | 2.92          | 2.36-3.60 | 2.33        | 1.41-3.83 |
| Alcoholic liver disease                                 | 3.70          | 2.77-4.93 | 2.94        | 1.83-4.73 |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| COPD                          | 1.89 | 1.75-2.05 | 1.41 | 1.23-1.63 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.50 | 1.30-1.73 | 1.22 | 0.94-1.57 |
| Pulmonary embolism            | 1.57 | 1.36-1.80 | 1.21 | 0.95-1.55 |

Abbreviations: HR, hazard ratio; COPD, Chronic Obstructive Pulmonary Disease.



**Table S14 - Weighted association between PPI prescription and mortality among PPI and H2RA users with and without propensity score trimming**

| Cause of death  | Without PS trimming |           | With PS trimming |           |
|---|---------------------|-----------|------------------|-----------|
|   | HR                  | 95% CI    | HR               | 95% CI    |
| <b>Top-level causes</b>                                 |                     |           |                  |           |
| All cause   | 1.38                | 1.33-1.44 | 1.36             | 1.33-1.39 |
| Communicable diseases                                   | 1.40                | 1.22-1.60 | 1.22             | 1.11-1.34 |
| Non-communicable diseases                               | 1.39                | 1.34-1.45 | 1.37             | 1.34-1.41 |
| Injuries/external                                       | 1.00                | 0.78-1.26 | 1.13             | 0.96-1.32 |
| <b>Second-level outcomes</b>                            |                     |           |                  |           |
| Neoplasms   | 1.74                | 1.63-1.86 | 1.61             | 1.55-1.68 |
| Cardiovascular/Circulatory                              | 1.17                | 1.10-1.25 | 1.12             | 1.07-1.17 |
| Chronic respiratory diseases                            | 1.40                | 1.22-1.62 | 1.51             | 1.38-1.66 |
| Liver cirrhosis   | 1.95                | 1.10-3.46 | 2.07             | 1.38-3.11 |
| Digestive other than cirrhosis                          | 1.43                | 1.20-1.69 | 1.47             | 1.30-1.67 |
| Neurological  | 0.92                | 0.68-1.24 | 1.21             | 1.03-1.41 |
| Mental and behavioural                                  | 1.00                | 0.78-1.27 | 1.38             | 1.17-1.62 |
| Diabetes, urogenital, blood and endocrine               | 1.27                | 1.06-1.51 | 1.30             | 1.13-1.50 |
| Musculoskeletal   | 1.29                | 0.88-1.89 | 1.14             | 0.87-1.50 |
| <b>Individual causes that been associated with PPIs</b> |                     |           |                  |           |
| Pneumonia   | 1.31                | 1.12-1.52 | 1.12             | 1.01-1.24 |
| Acute kidney injury                                     | 2.29                | 0.87-6.02 | 1.96             | 0.85-4.55 |
| <i>C. difficile</i> enterocolitis                       | 1.62                | 0.83-3.14 | 1.69             | 1.02-2.80 |
| Atrial fibrillation/flutter                             | 1.25                | 0.87-1.79 | 1.38             | 1.02-1.87 |
| Heart failure   | 1.33                | 1.02-1.72 | 1.23             | 1.01-1.50 |
| Aortic aneurysm   | 1.10                | 0.75-1.63 | 1.04             | 0.85-1.26 |
| Dementia and Alzheimer's                                | 0.94                | 0.75-1.17 | 1.26             | 1.09-1.46 |
| Chronic kidney disease                                  | 1.59                | 0.97-2.62 | 1.23             | 0.82-1.85 |
| Hypertensive heart disease                              | 0.69                | 0.46-1.03 | 0.76             | 0.55-1.05 |
| Ischaemic heart disease                                 | 1.22                | 1.12-1.34 | 1.09             | 1.02-1.16 |
| Lung cancer   | 2.06                | 1.76-2.42 | 1.85             | 1.68-2.04 |
| Mesothelioma  | 1.79                | 1.04-3.09 | 2.22             | 1.57-3.15 |
| Breast cancer   | 2.02                | 1.62-2.51 | 1.47             | 1.28-1.69 |
| Liver cancer  | 1.65                | 1.03-2.66 | 1.91             | 1.32-2.74 |
| Prostate cancer   | 1.65                | 1.29-2.11 | 1.52             | 1.29-1.80 |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| Gastric cancer                | 2.35 | 1.39-3.99 | 2.43 | 1.87-3.15 |
| Alcoholic liver disease       | 2.96 | 1.70-5.14 | 3.26 | 2.21-4.81 |
| COPD                          | 1.37 | 1.14-1.66 | 1.48 | 1.32-1.67 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.05 | 0.69-1.59 | 1.14 | 0.89-1.45 |
| Pulmonary embolism            | 1.33 | 0.85-2.09 | 1.11 | 0.79-1.56 |

Abbreviations: HR, hazard ratio; PS, propensity score; COPD, Chronic Obstructive Pulmonary Disease.

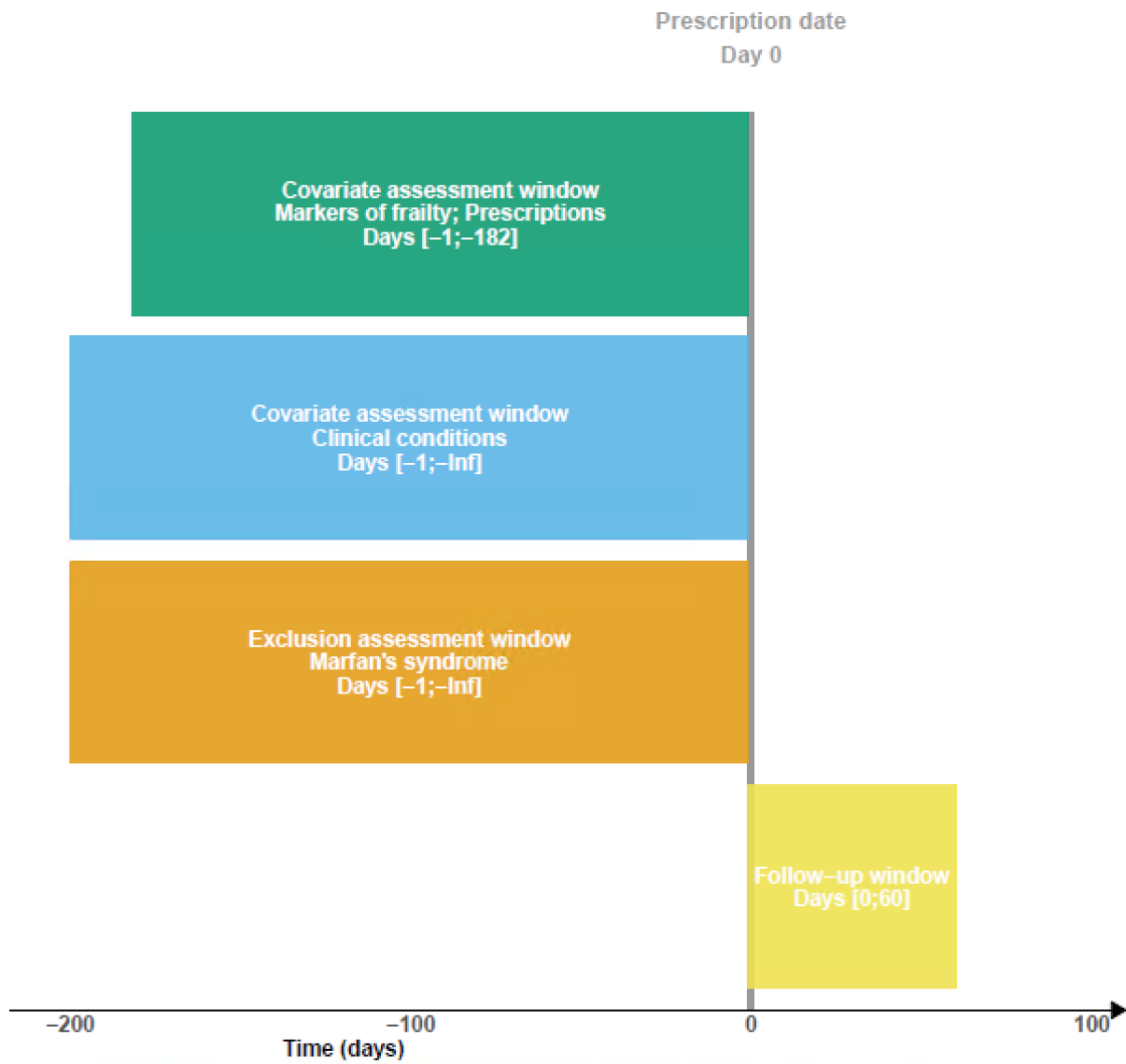
**Table S15 - Weighted association between PPI prescription and mortality among PPI users and non-users with and without propensity score trimming**

| Cause of death  | Without PS trimming |             | With PS trimming |             |
|---|---------------------|-------------|------------------|-------------|
|   | HR                  | 95% CI      | HR               | 95% CI      |
| <b>Top-level causes</b>                                 |                     |             |                  |             |
| All cause   | 1.96                | 1.94-1.99   | 1.78             | 1.74-1.82   |
| Communicable diseases                                   | 1.49                | 1.42-1.56   | 1.40             | 1.33-1.48   |
| Non-communicable diseases                               | 1.99                | 1.96-2.02   | 1.80             | 1.75-1.84   |
| Injuries/external                                       | 1.26                | 1.17-1.35   | 1.24             | 1.13-1.35   |
| <b>Second-level outcomes</b>                            |                     |             |                  |             |
| Neoplasms   | 3.74                | 3.64-3.84   | 3.48             | 3.36-3.60   |
| Cardiovascular/Circulatory                              | 1.36                | 1.33-1.39   | 1.30             | 1.24-1.35   |
| Chronic respiratory diseases                            | 1.46                | 1.40-1.53   | 1.45             | 1.38-1.54   |
| Liver cirrhosis   | 4.10                | 3.36-5.01   | 4.52             | 3.58-5.71   |
| Digestive other than cirrhosis                          | 1.88                | 1.78-2.00   | 1.79             | 1.64-1.95   |
| Neurological  | 1.16                | 1.08-1.24   | 0.93             | 0.66-1.32   |
| Mental and behavioural                                  | 1.07                | 1.00-1.15   | 1.01             | 0.93-1.09   |
| Diabetes, urogenital, blood and endocrine               | 1.60                | 1.50-1.71   | 1.45             | 1.32-1.60   |
| Musculoskeletal   | 1.56                | 1.35-1.80   | 1.32             | 1.11-1.58   |
| <b>Individual causes that been associated with PPIs</b> |                     |             |                  |             |
| Pneumonia   | 1.44                | 1.37-1.53   | 1.35             | 1.27-1.43   |
| Acute kidney injury                                     | 1.56                | 1.10-2.21   | 1.59             | 1.03-2.46   |
| <i>C. difficile</i> enterocolitis                       | 2.16                | 1.71-2.74   | 1.94             | 1.47-2.56   |
| Atrial fibrillation/flutter                             | 1.54                | 1.32-1.79   | 1.52             | 1.29-1.79   |
| Heart failure   | 1.87                | 1.67-2.10   | 1.61             | 1.42-1.83   |
| Aortic aneurysm   | 1.06                | 0.97-1.16   | 1.05             | 0.94-1.18   |
| Dementia and Alzheimer's                                | 1.03                | 0.96-1.09   | 0.98             | 0.92-1.05   |
| Chronic kidney disease                                  | 2.11                | 1.64-2.71   | 1.40             | 0.96-2.04   |
| Hypertensive heart disease                              | 1.02                | 0.87-1.19   | 1.14             | 0.95-1.39   |
| Ischaemic heart disease                                 | 1.35                | 1.31-1.39   | 1.24             | 1.15-1.34   |
| Lung cancer   | 3.16                | 2.98-3.34   | 3.31             | 3.07-3.56   |
| Mesothelioma  | 3.62                | 2.91-4.50   | 3.25             | 2.43-4.36   |
| Breast cancer   | 2.80                | 2.57-3.04   | 2.91             | 2.55-3.32   |
| Liver cancer  | 4.72                | 3.83-5.82   | 3.25             | 2.58-4.11   |
| Prostate cancer   | 3.14                | 2.84-3.48   | 2.81             | 2.48-3.18   |
| Gastric cancer  | 14.59               | 11.16-19.08 | 12.71            | 10.05-16.08 |

|                               |      |           |      |           |
|-------------------------------|------|-----------|------|-----------|
| Alcoholic liver disease       | 3.24 | 2.80-3.75 | 3.53 | 2.75-4.53 |
| COPD                          | 1.29 | 1.22-1.35 | 1.31 | 1.22-1.40 |
| <b>Control outcomes</b>       |      |           |      |           |
| Accidental trauma excl. falls | 1.28 | 1.15-1.43 | 1.29 | 1.13-1.47 |
| Pulmonary embolism            | 1.43 | 1.23-1.67 | 1.45 | 1.20-1.76 |

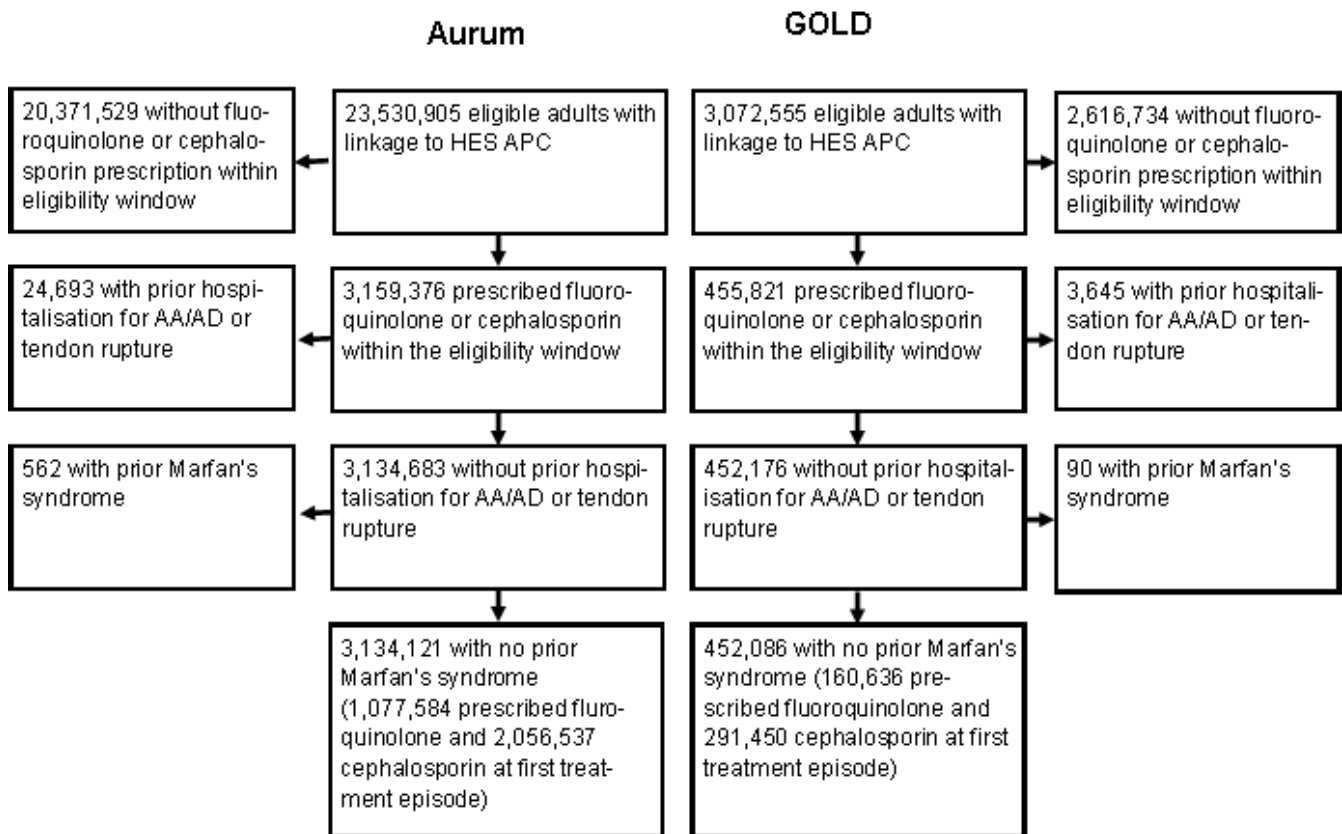
Abbreviations: HR, hazard ratio; PS, propensity score; COPD, Chronic Obstructive Pulmonary Disease.

**APPENDIX 3: SUPPLEMENTARY INFORMATION FOR  
MANUSCRIPT ON ASSOCIATIONS BETWEEN  
FLUOROQUINOLONES AND AORTIC ANEURYSM OR  
AORTIC DISSECTION**

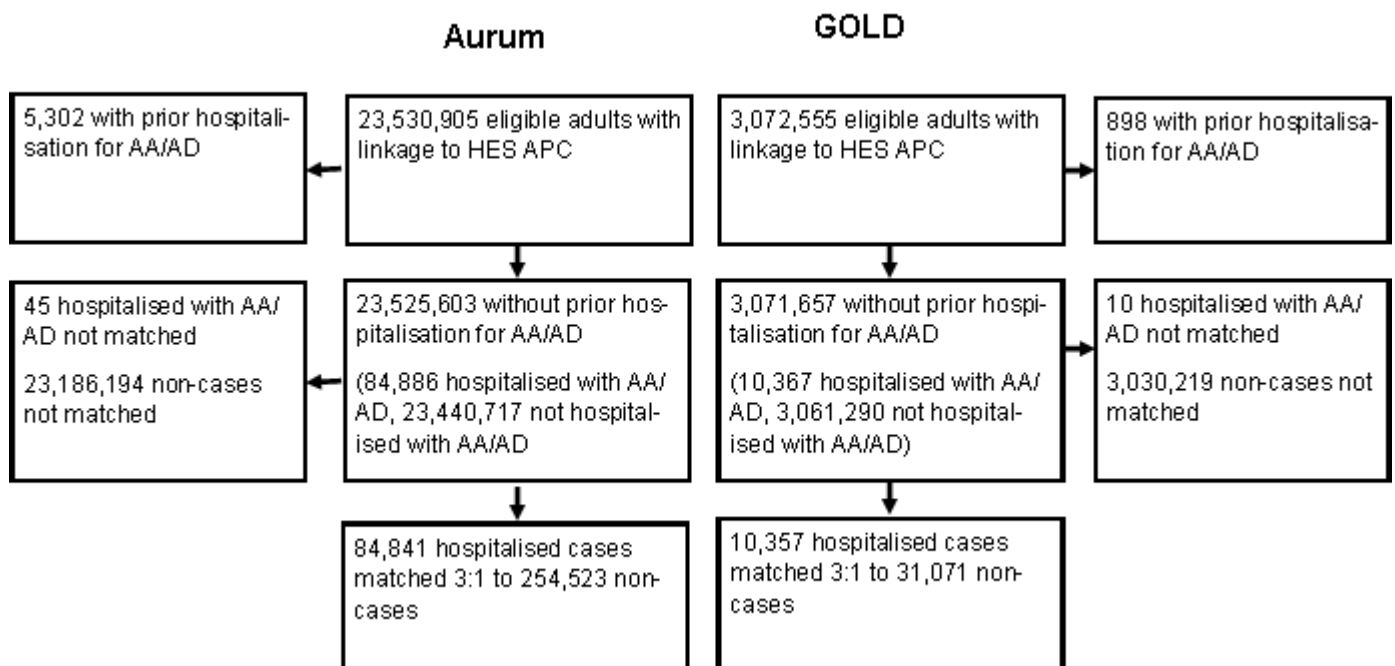


***eFigure 1: Cohort studies: Graphical depiction of cohort design***

Multiple treatment episodes were included per individual. Treatment episodes of fluroquinolone or cephalosporin among adults (aged 18+ years) without Marfan's syndrome eligible for HES APC linkage were included if occurring within the eligibility window.



***eFigure 2: Flow chart of cohort study subjects***



***eFigure 3: Flow chart of case-crossover study subjects***

***eTable 1: Characteristics of individuals included in cohort studies at all treatment episodes***

| Characteristic                                     | Aurum                        |                                | GOLD                       |                              |
|--|------------------------------|--------------------------------|----------------------------|------------------------------|
|  | Cephalosporin, N = 4,524,703 | Fluoroquinolone, N = 2,279,956 | Cephalosporin, N = 606,374 | Fluoroquinolone, N = 327,831 |
| Age <sup>1</sup>                                   | 58 (39, 74)                  | 59 (43, 73)                    | 59 (40, 74)                | 60 (44, 73)                  |
| Female   | 3,367,587 (74%)              | 1,214,994 (53%)                | 451,089 (74%)              | 180,332 (55%)                |
| Calendar year                                      |                              |                                |                            |                              |
| 1997-2001  | 1,043,936 (23%)              | 389,130 (17%)                  | 118,034 (19%)              | 48,079 (15%)                 |
| 2002-2006  | 1,545,696 (34%)              | 612,865 (27%)                  | 238,022 (39%)              | 107,143 (33%)                |
| 2007-2011  | 1,248,274 (28%)              | 625,889 (27%)                  | 193,793 (32%)              | 110,007 (34%)                |
| 2012-2016  | 528,571 (12%)                | 453,626 (20%)                  | 48,868 (8.1%)              | 50,900 (16%)                 |
| 2017-2019  | 158,226 (3.5%)               | 198,446 (8.7%)                 | 7,657 (1.3%)               | 11,702 (3.6%)                |
| Ethnicity  |                              |                                |                            |                              |
| White  | 3,968,937 (92%)              | 2,017,036 (92%)                | 545,693 (96%)              | 297,503 (96%)                |
| South Asian  | 207,360 (4.8%)               | 91,163 (4.2%)                  | 12,791 (2.2%)              | 6,016 (1.9%)                 |
| Black  | 90,341 (2.1%)                | 43,699 (2.0%)                  | 4,750 (0.8%)               | 2,690 (0.9%)                 |
| Other  | 37,430 (0.9%)                | 17,562 (0.8%)                  | 4,890 (0.9%)               | 2,288 (0.7%)                 |
| Mixed  | 25,276 (0.6%)                | 12,719 (0.6%)                  | 1,895 (0.3%)               | 1,065 (0.3%)                 |
| Missing  | 195,359                      | 97,777                         | 36,355                     | 18,269                       |
| Below 10th percentile Carstairs Index              | 221,928 (4.9%)               | 124,124 (5.4%)                 | 22,084 (3.6%)              | 14,281 (4.4%)                |
| BMI <sup>1</sup>                                   | 28 (25, 32)                  | 28 (25, 32)                    | 25.8 (22.8, 29.7)          | 26.1 (23.1, 29.8)            |
| Missing  | 788,365                      | 402,841                        | 54,642                     | 28,539                       |
| Current smoker                                     | 1,496,401 (33%)              | 723,603 (32%)                  | 198,431 (33%)              | 100,893 (31%)                |
| Heavy drinker                                      | 90,978 (2.0%)                | 64,940 (2.8%)                  | 10,521 (1.7%)              | 8,200 (2.5%)                 |
| Number of GP appointments in prior 6m <sup>1</sup> | 2.0 (0.0, 6.0)               | 2.0 (0.0, 7.0)                 | 5 (2, 10)                  | 6 (3, 12)                    |
| Hospitalised in prior 6m                           | 961,020 (21%)                | 549,220 (24%)                  | 128,172 (21%)              | 79,230 (24%)                 |
| Statin in prior 6 months                           | 785,320 (17%)                | 450,769 (20%)                  | 100,755 (17%)              | 64,374 (20%)                 |
| Corticosteroid in prior 6 months                   | 435,657 (9.6%)               | 290,257 (13%)                  | 68,715 (11%)               | 50,389 (15%)                 |
| Coronary heart disease                             | 544,068 (12%)                | 280,867 (12%)                  | 73,047 (12%)               | 41,103 (13%)                 |
| Hypertension                                       | 1,282,770 (28%)              | 673,306 (30%)                  | 167,496 (28%)              | 95,121 (29%)                 |
| Diabetes   | 466,141 (10%)                | 258,908 (11%)                  | 72,824 (12%)               | 43,901 (13%)                 |
| Uncontrolled diabetes                              | 317,315 (7.0%)               | 178,812 (7.8%)                 | 38,710 (6.4%)              | 24,338 (7.4%)                |



| <b>Characteristic</b>       | <b>Aurum</b>                    |                                   | <b>GOLD</b>                   |                                 |
|-----------------------------|---------------------------------|-----------------------------------|-------------------------------|---------------------------------|
|                             | Cephalosporin, N =<br>4,524,703 | Fluoroquinolone, N =<br>2,279,956 | Cephalosporin, N =<br>606,374 | Fluoroquinolone, N =<br>327,831 |
| Cerebrovascular disease     | 323,685 (7.2%)                  | 157,459 (6.9%)                    | 43,175 (7.1%)                 | 21,733 (6.6%)                   |
| Dementia                    | 104,643 (2.3%)                  | 37,376 (1.6%)                     | 13,374 (2.2%)                 | 4,479 (1.4%)                    |
| HIV                         | 3,239 (<0.1%)                   | 3,503 (0.2%)                      | 278 (<0.1%)                   | 250 (<0.1%)                     |
| Chronic liver disease       | 21,521 (0.5%)                   | 17,700 (0.8%)                     | 2,295 (0.4%)                  | 1,956 (0.6%)                    |
| Chronic kidney disease      | 886,816 (20%)                   | 431,122 (19%)                     | 126,181 (21%)                 | 67,849 (21%)                    |
| Peripheral vascular disease | 120,340 (2.7%)                  | 70,277 (3.1%)                     | 17,921 (3.0%)                 | 10,919 (3.3%)                   |
| Myocardial infarction       | 178,732 (4.0%)                  | 97,285 (4.3%)                     | 24,509 (4.0%)                 | 14,336 (4.4%)                   |
| Carotid artery disease      | 16,652 (0.4%)                   | 9,312 (0.4%)                      | 2,463 (0.4%)                  | 1,522 (0.5%)                    |
| Aortic aneurysm             | 12,028 (0.3%)                   | 7,471 (0.3%)                      | 1,553 (0.3%)                  | 924 (0.3%)                      |
| Multiple sclerosis          | 38,437 (0.8%)                   | 22,145 (1.0%)                     | 5,576 (0.9%)                  | 3,219 (1.0%)                    |
| Rheumatoid arthritis        | 95,075 (2.1%)                   | 43,209 (1.9%)                     | 18,912 (3.1%)                 | 9,199 (2.8%)                    |

<sup>1</sup>Median (interquartile range)

***eTable 2: Cohort studies - Hazard ratios between fluoroquinolone relative to cephalosporin use and AA/AD or tendon rupture at all treatment episodes***

| Outcome                       | Method        | Aurum        |           |         | GOLD         |           |         | Pooled       |           |         |
|-------------------------------|---------------|--------------|-----------|---------|--------------|-----------|---------|--------------|-----------|---------|
|                               |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value |
| Aortic aneurysm or dissection | Unadjusted    | 1.32         | 1.21-1.43 | <0.001  | 0.98         | 0.78-1.24 | 0.875   | 1.27         | 1.18-1.37 | <0.001  |
|                               | IPTW weighted | 1.04         | 0.96-1.14 | 0.310   | 0.86         | 0.67-1.09 | 0.219   | 1.02         | 0.94-1.11 | 0.582   |
| Tendon rupture                | Unadjusted    | 2.21         | 1.92-2.54 | <0.001  | 2.97         | 1.91-4.62 | <0.001  | 2.27         | 1.98-2.59 | <0.001  |
|                               | IPTW weighted | 1.84         | 1.59-2.13 | <0.001  | 2.45         | 1.55-3.88 | <0.001  | 1.89         | 1.64-2.17 | <0.001  |

***eTable 3: Cohort studies - Complete case-analysis hazard ratios between fluoroquinolone relative to cephalosporin use and AA/AD or tendon rupture at first treatment episode***

| Outcome                       | Method        | Aurum        |           |         | GOLD         |           |         | Pooled       |           |         |
|-------------------------------|---------------|--------------|-----------|---------|--------------|-----------|---------|--------------|-----------|---------|
|                               |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value |
| Aortic aneurysm or dissection | Unadjusted    | 1.39         | 1.20-1.60 | <0.001  | 1.15         | 0.80-1.63 | 0.448   | 1.35         | 1.19-1.54 | <0.001  |
|                               | IPTW Weighted | 1.06         | 0.91-1.22 | 0.473   | 0.96         | 0.66-1.39 | 0.827   | 1.04         | 0.91-1.19 | 0.550   |
| Tendon rupture                | Unadjusted    | 2.36         | 1.84-3.04 | <0.001  | 3.13         | 1.49-6.58 | 0.003   | 2.43         | 1.92-3.09 | <0.001  |
|                               | IPTW Weighted | 1.89         | 1.45-2.46 | <0.001  | 2.63         | 1.22-5.67 | 0.013   | 1.95         | 1.54-2.48 | <0.001  |

***eTable 4: Cohort studies - Complete case-analysis hazard ratios between fluoroquinolone relative to cephalosporin use and AA/AD or tendon rupture at all treatment episodes***

| Outcome                       | Method        | Aurum        |           |         | GOLD         |           |         | Pooled       |           |         |
|-------------------------------|---------------|--------------|-----------|---------|--------------|-----------|---------|--------------|-----------|---------|
|                               |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value |
| Aortic aneurysm or dissection | Unadjusted    | 1.39         | 1.27-1.51 | <0.001  | 1.05         | 0.83-1.34 | 0.686   | 1.34         | 1.24-1.46 | <0.001  |
|                               | IPTW Weighted | 1.07         | 0.98-1.18 | 0.119   | 0.87         | 0.68-1.13 | 0.297   | 1.05         | 0.97-1.14 | 0.259   |
| Tendon rupture                | Unadjusted    | 2.20         | 1.90-2.54 | <0.001  | 3.06         | 1.95-4.81 | <0.001  | 2.27         | 1.97-2.61 | <0.001  |
|                               | IPTW Weighted | 1.81         | 1.56-2.11 | <0.001  | 2.49         | 1.56-3.98 | <0.001  | 1.87         | 1.62-2.15 | <0.001  |

***eTable 5: Cohort studies - Hazard ratios between fluoroquinolone relative to cephalosporin use and AA/AD or tendon rupture at all treatment episodes adjusting for sex only***

| Outcome                       | Method        | Aurum        |           |         | GOLD         |           |         | Pooled       |           |         |
|-------------------------------|---------------|--------------|-----------|---------|--------------|-----------|---------|--------------|-----------|---------|
|                               |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value |
| Aortic aneurysm or dissection | Unadjusted    | 1.39         | 1.20-1.60 | <0.001  | 1.15         | 0.81-1.64 | 0.442   | 1.35         | 1.19-1.54 | <0.001  |
|                               | IPTW Weighted | 0.99         | 0.86-1.15 | 0.891   | 0.90         | 0.63-1.30 | 0.584   | 0.98         | 0.85-1.12 | 0.736   |
| Tendon rupture                | Unadjusted    | 2.37         | 1.84-3.05 | <0.001  | 3.14         | 1.49-6.59 | 0.003   | 2.44         | 1.92-3.10 | <0.001  |
|                               | IPTW Weighted | 2.08         | 1.61-2.70 | <0.001  | 3.00         | 1.40-6.40 | 0.005   | 2.16         | 1.70-2.75 | <0.001  |

***eTable 6: Case-crossover study - Characteristics of cases and non-cases in CPRD Aurum***

| <b>Characteristic</b> | <b>Case, Reference period<br/>N = 84,841</b> | <b>Case, Risk period<br/>N = 84,841</b> | <b>Non-case, Reference period<br/>N = 254,523</b> | <b>Non-case, Risk period<br/>N = 254,523</b> |
|-----------------------|--|---|---|--|
| Age <sup>1</sup>      | 76 (69, 83)                                  | 77 (70, 83)                             | 76 (69, 83)                                       | 77 (70, 83)                                  |
| Sex                   |  |   |   |  |
| Female                | 23,551 (28%)                                 |   | 70,653 (28%)                                      |  |
| Male                  | 61,290 (72%)                                 |   | 183,870 (72%)                                     |  |
| Calendar year         |  |   |   |  |
| 1996-2000             | 9,068 (11%)                                  | 8,512 (10%)                             | 27,204 (11%)                                      | 25,536 (10%)                                 |
| 2001-2005             | 14,365 (17%)                                 | 14,153 (17%)                            | 43,095 (17%)                                      | 42,459 (17%)                                 |
| 2006-2010             | 20,012 (24%)                                 | 19,725 (23%)                            | 60,036 (24%)                                      | 59,175 (23%)                                 |
| 2011-2015             | 23,926 (28%)                                 | 23,711 (28%)                            | 71,778 (28%)                                      | 71,133 (28%)                                 |
| 2016-2019             | 17,470 (21%)                                 | 18,740 (22%)                            | 52,410 (21%)                                      | 56,220 (22%)                                 |
| Fluoroquinolone       | 813 (1.0%)                                   | 1,138 (1.3%)                            | 695 (0.3%)  | 645 (0.3%)                                   |
| Cephalosporin         | 1,273 (1.5%)                                 | 1,733 (2.0%)                            | 1,063 (0.4%)                                      | 1,023 (0.4%)                                 |
| Trimethoprim          | 1,783 (2.1%)                                 | 2,794 (3.3%)                            | 1,670 (0.7%)                                      | 1,600 (0.6%)                                 |
| Co-amoxiclav          | 1,143 (1.3%)                                 | 1,746 (2.1%)                            | 938 (0.4%)  | 949 (0.4%)                                   |

<sup>1</sup>Median (interquartile range)

***eTable 7: Case-crossover study - Characteristics of cases and non-cases in CPRD GOLD***

| <b>Characteristic</b> | <b>Case, Reference period<br/>N = 10,357</b> | <b>Case, Risk period<br/>N = 10,357</b> | <b>Non-case, Reference period<br/>N = 31,071</b> | <b>Non-case, Risk period<br/>N = 31,071</b> |
|-----------------------|--|---|--|---|
| Age <sup>1</sup>      | 76 (70, 82)                                  | 77 (70, 83)                             | 76 (70, 82)                                      | 77 (70, 83)                                 |
| Sex                   |  |   |  |   |
| Female                | 2,809 (27%)                                  |   | 8,427 (27%)                                      |   |
| Male                  | 7,548 (73%)                                  |   | 22,644 (73%)                                     |   |
| Calendar year         |  |   |  |   |
| 1996-2000             | 937 (9.0%)                                   | 853 (8.2%)                              | 2,811 (9.0%)                                     | 2,559 (8.2%)                                |
| 2001-2005             | 2,424 (23%)                                  | 2,366 (23%)                             | 7,272 (23%)                                      | 7,098 (23%)                                 |
| 2006-2010             | 3,369 (33%)                                  | 3,375 (33%)                             | 10,107 (33%)                                     | 10,125 (33%)                                |
| 2011-2015             | 2,756 (27%)                                  | 2,805 (27%)                             | 8,268 (27%)                                      | 8,415 (27%)                                 |
| 2016-2019             | 871 (8.4%)                                   | 958 (9.2%)                              | 2,613 (8.4%)                                     | 2,874 (9.2%)                                |
| Fluoroquinolone       | 92 (0.9%)                                    | 145 (1.4%)                              | 100 (0.3%)                                       | 98 (0.3%)                                   |
| Cephalosporin         | 169 (1.6%)                                   | 240 (2.3%)                              | 152 (0.5%)                                       | 146 (0.5%)                                  |
| Trimethoprim          | 255 (2.5%)                                   | 380 (3.7%)                              | 212 (0.7%)                                       | 226 (0.7%)                                  |
| Co-amoxiclav          | 129 (1.2%)                                   | 237 (2.3%)                              | 136 (0.4%)                                       | 149 (0.5%)                                  |

<sup>1</sup>Median (interquartile range)

***eTable 8: Case-crossover study – Odds ratios for AA/AD with fluoroquinolones and comparator antibiotics relative to non-use***

| Comparison                  | Aurum      |           |         | GOLD       |           |         | Pooled     |           |         |
|-----------------------------|------------|-----------|---------|------------|-----------|---------|------------|-----------|---------|
|                             | Odds ratio | 95% CI    | p-value | Odds ratio | 95% CI    | p-value | Odds Ratio | 95% CI    | p-value |
| Fluoroquinolone vs. non-use | 1.57       | 1.35-1.84 | <0.001  | 1.65       | 1.09-2.50 | 0.017   | 1.58       | 1.37-1.83 | <0.001  |
| Cephalosporin vs. non-use   | 1.49       | 1.31-1.70 | <0.001  | 1.57       | 1.11-2.22 | 0.010   | 1.50       | 1.33-1.70 | <0.001  |
| Trimethoprim vs. non-use    | 1.81       | 1.63-2.01 | <0.001  | 1.52       | 1.15-2.01 | 0.003   | 1.77       | 1.61-1.95 | <0.001  |
| Co-amoxiclav vs. non-use    | 1.59       | 1.40-1.81 | <0.001  | 1.78       | 1.26-2.51 | 0.001   | 1.61       | 1.43-1.82 | <0.001  |

***eTable 9: Case-crossover studies - Odds ratios for AA/AD with period length of 30 days and interval between periods of 30 days***

| Comparison                        | Aurum      |           |         | GOLD       |           |         | Pooled     |           |         |
|-----------------------------------|------------|-----------|---------|------------|-----------|---------|------------|-----------|---------|
|                                   | Odds ratio | 95% CI    | p-value | Odds ratio | 95% CI    | p-value | Odds Ratio | 95% CI    | p-value |
| Fluoroquinolone vs. non-use       | 1.45       | 1.18-1.78 | <0.001  | 1.49       | 0.85-2.61 | 0.159   | 1.46       | 1.20-1.77 | <0.001  |
| Fluoroquinolone vs. cephalosporin | 0.87       | 0.67-1.13 | 0.304   | 1.04       | 0.51-2.11 | 0.924   | 0.89       | 0.70-1.14 | 0.351   |
| Fluoroquinolone vs. trimethoprim  | 0.74       | 0.58-0.95 | 0.016   | 0.70       | 0.37-1.35 | 0.289   | 0.74       | 0.59-0.93 | 0.009   |
| Fluoroquinolone vs. co-amoxiclav  | 0.82       | 0.63-1.07 | 0.146   | 0.70       | 0.34-1.42 | 0.323   | 0.81       | 0.63-1.03 | 0.088   |

***eTable 10: Case-crossover studies - Odds ratios for AA/AD with period length of 60 days and interval between periods of 60 days***

| Comparison                        | Aurum      |           |         | GOLD       |           |         | Pooled     |           |         |
|-----------------------------------|------------|-----------|---------|------------|-----------|---------|------------|-----------|---------|
|                                   | Odds ratio | 95% CI    | p-value | Odds ratio | 95% CI    | p-value | Odds Ratio | 95% CI    | p-value |
| Fluoroquinolone vs. non-use       | 1.62       | 1.39-1.89 | <0.001  | 1.29       | 0.85-1.97 | 0.232   | 1.58       | 1.37-1.83 | <0.001  |
| Fluoroquinolone vs. cephalosporin | 1.02       | 0.84-1.25 | 0.814   | 0.73       | 0.43-1.24 | 0.243   | 0.98       | 0.82-1.18 | 0.849   |
| Fluoroquinolone vs. trimethoprim  | 0.85       | 0.71-1.02 | 0.080   | 0.78       | 0.48-1.28 | 0.331   | 0.84       | 0.71-1.00 | 0.048   |
| Fluoroquinolone vs. co-amoxiclav  | 0.97       | 0.80-1.18 | 0.766   | 0.73       | 0.43-1.25 | 0.250   | 0.94       | 0.78-1.13 | 0.497   |

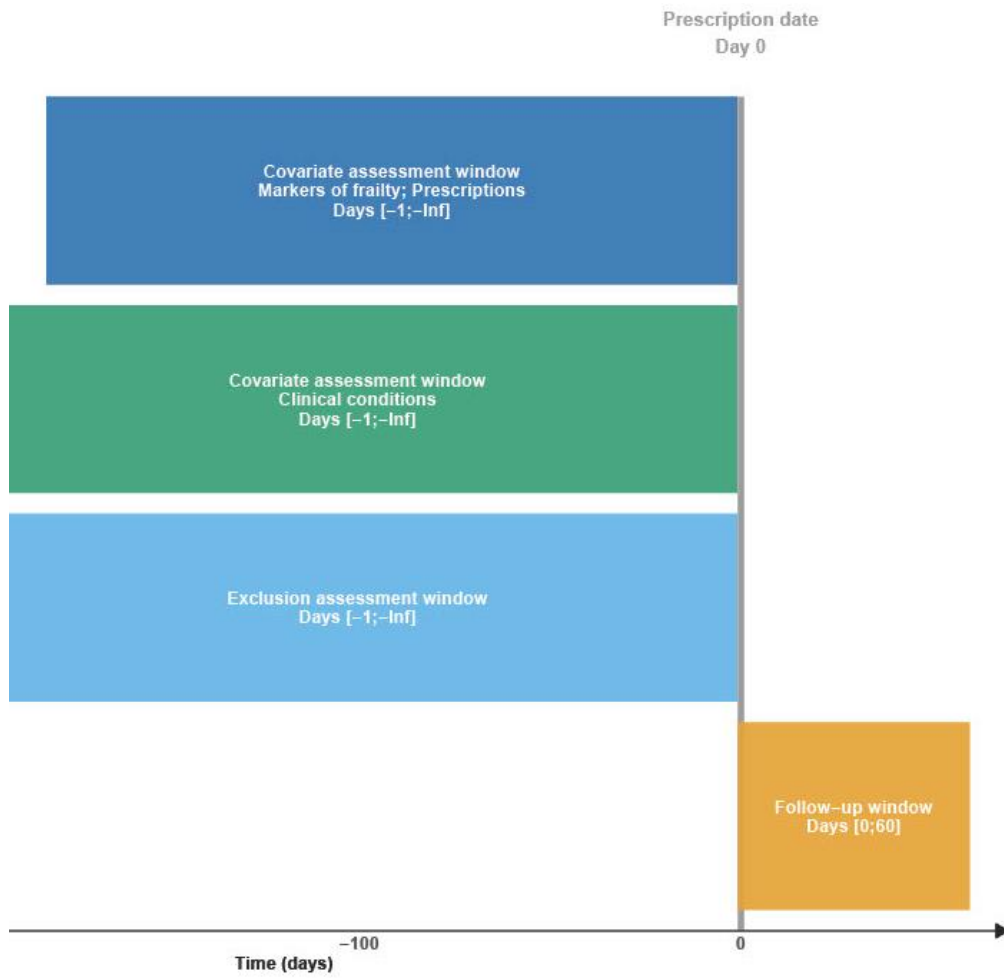
***eTable 11: Case-crossover studies - Odds ratios for AA/AD with period length of 90 days and interval between periods of 30 days***

| Comparison                        | Aurum      |           |         | GOLD       |           |         | Pooled     |           |         |
|-----------------------------------|------------|-----------|---------|------------|-----------|---------|------------|-----------|---------|
|                                   | Odds ratio | 95% CI    | p-value | Odds ratio | 95% CI    | p-value | Odds Ratio | 95% CI    | p-value |
| Fluoroquinolone vs. non-use       | 1.55       | 1.35-1.77 | <0.001  | 1.27       | 0.89-1.83 | 0.188   | 1.51       | 1.33-1.71 | <0.001  |
| Fluoroquinolone vs. cephalosporin | 1.07       | 0.90-1.28 | 0.420   | 0.77       | 0.49-1.21 | 0.254   | 1.03       | 0.88-1.21 | 0.725   |
| Fluoroquinolone vs. trimethoprim  | 0.90       | 0.77-1.06 | 0.203   | 0.85       | 0.56-1.30 | 0.453   | 0.90       | 0.77-1.04 | 0.146   |
| Fluoroquinolone vs. co-amoxiclav  | 0.92       | 0.78-1.09 | 0.350   | 0.79       | 0.50-1.25 | 0.315   | 0.90       | 0.77-1.06 | 0.220   |

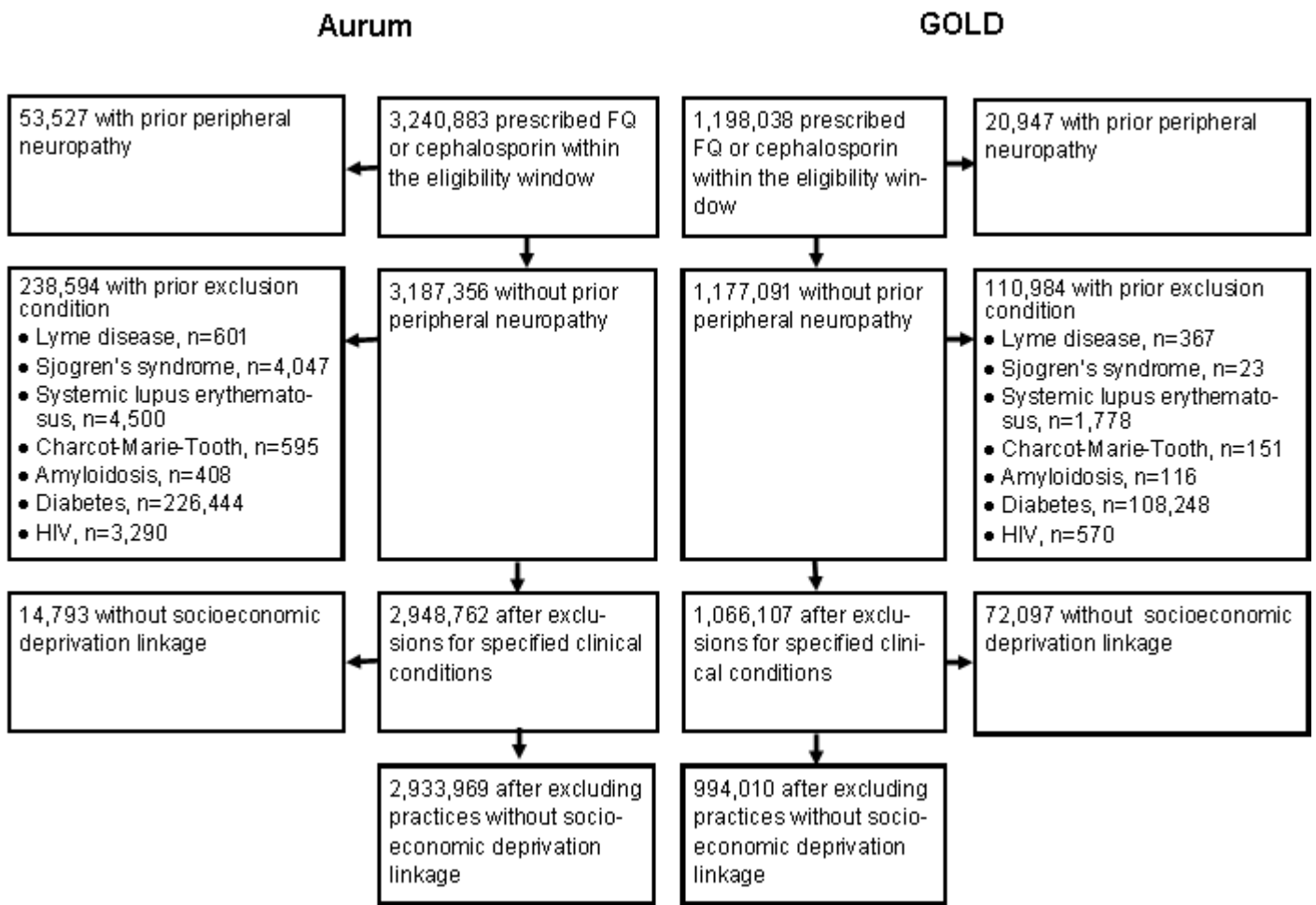
**APPENDIX 4: SUPPLEMENTARY INFORMATION FOR  
MANUSCRIPT ON ASSOCIATIONS BETWEEN  
FLUOROQUINOLONES AND PERIPHERAL NEUROPATHY**



## Figures

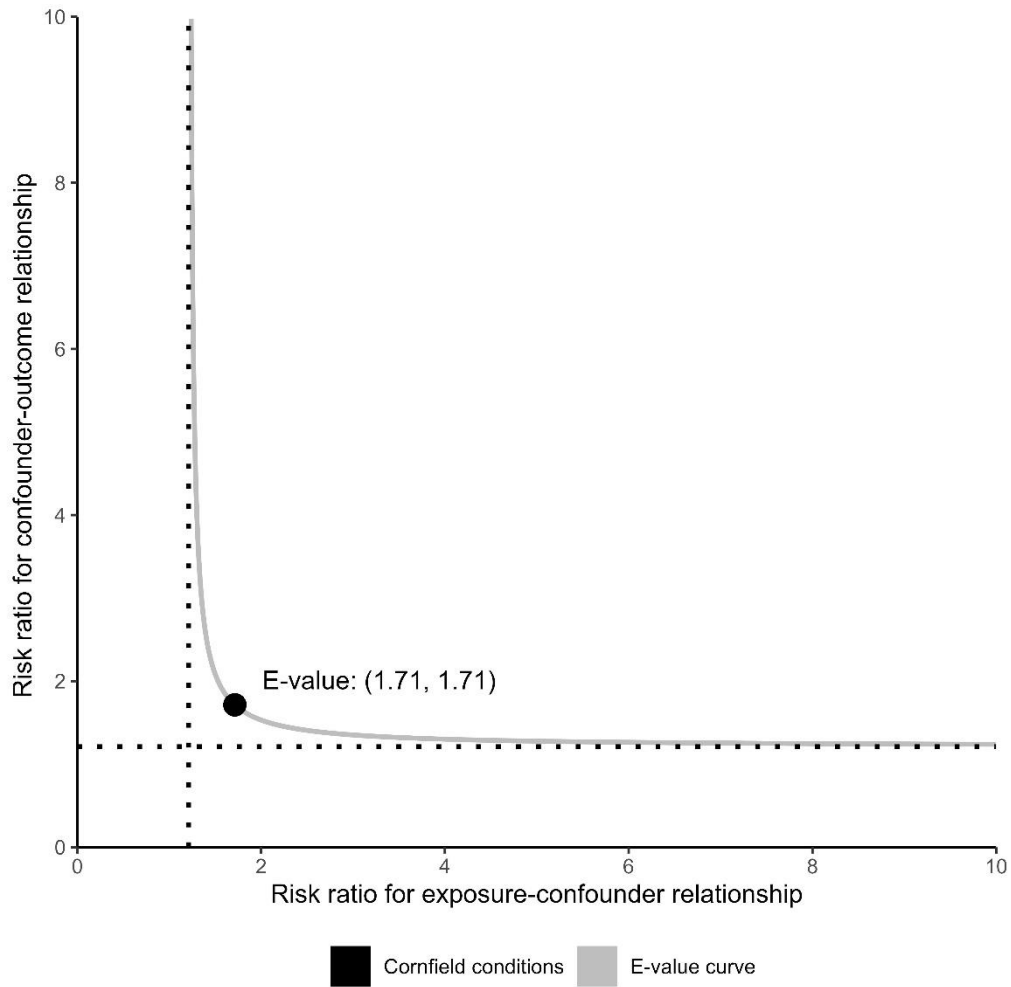


***Appendix Figure 1: Graphical depiction of cohort design***



***Appendix Figure 2: Flow chart of study subjects***

Definitions: FQ, fluoroquinolones; HIV, human immunodeficiency virus.



**Appendix Figure 3: E-value plot for the association between fluoroquinolone prescribing and peripheral neuropathy (pooled aHR 1.21) over all treatment episodes**

## Tables

***Appendix Table 1: Characteristics of patients at all treatment episodes***

| Characteristic                                     | Aurum                           |                                   | GOLD                            |                                 |
|--|---------------------------------|-----------------------------------|---------------------------------|---------------------------------|
|  | Cephalosporin, N<br>= 4,088,238 | Fluoroquinolone, N<br>= 2,030,151 | Cephalosporin, N<br>= 1,263,022 | Fluoroquinolone, N<br>= 755,855 |
| Age  | 55 (38, 72)                     | 57 (41, 72)                       | 56 (39, 72)                     | 58 (42, 71)                     |
| Female   | 3,078,838 (75.3)                | 1,090,921 (53.7)                  | 963,789 (76.3)                  | 410,930 (54.4)                  |
| Calendar year                                      |                                 |                                   |                                 |                                 |
| 1997-2001  | 990,500 (24.2)                  | 366,098 (18.0)                    | 192,472 (15.2)                  | 78,542 (10.4)                   |
| 2002-2006  | 1,415,190 (34.6)                | 557,279 (27.5)                    | 460,907 (36.5)                  | 218,805 (28.9)                  |
| 2007-2011  | 1,107,887 (27.1)                | 553,004 (27.2)                    | 440,213 (34.9)                  | 261,659 (34.6)                  |
| 2012-2016  | 446,462 (10.9)                  | 387,465 (19.1)                    | 137,881 (10.9)                  | 144,876 (19.2)                  |
| 2017-2019  | 128,199 (3.1)                   | 166,305 (8.2)                     | 31,549 (2.5)                    | 51,973 (6.9)                    |
| Ethnicity  |                                 |                                   |                                 |                                 |
| White  | 3,572,045 (92.2)                | 1,791,614 (93.1)                  | 732,340 (96.3)                  | 428,819 (96.8)                  |
| South Asian  | 167,655 (4.3)                   | 69,272 (3.6)                      | 13,822 (1.8)                    | 6,529 (1.5)                     |
| Black  | 76,865 (2.0)                    | 35,821 (1.9)                      | 5,751 (0.8)                     | 2,890 (0.7)                     |
| Other  | 34,101 (0.9)                    | 15,635 (0.8)                      | 5,965 (0.8)                     | 3,277 (0.7)                     |
| Mixed  | 22,713 (0.6)                    | 11,179 (0.6)                      | 2,263 (0.3)                     | 1,300 (0.3)                     |
| Missing  | 214,859                         | 106,630                           | 502,881                         | 313,040                         |
| Below 10th percentile<br>Carstairs Index           | 206,213 (5.0)                   | 113,180 (5.6)                     | 47,283 (3.7)                    | 35,550 (4.7)                    |
| BMI  | 27.6 (24.3, 31.8)               | 27.5 (24.4, 31.4)                 | 25.7 (22.7, 29.5)               | 26.0 (23.0, 29.6)               |
| Missing  | 702,774                         | 351,832                           | 118,417                         | 75,201                          |
| Current smoker                                     | 1,370,220 (33.5)                | 651,401 (32.1)                    | 408,234 (32.3)                  | 231,351 (30.6)                  |
| Heavy drinker                                      | 83,688 (2.0)                    | 59,232 (2.9)                      | 29,201 (2.3)                    | 28,489 (3.8)                    |
| Number of GP<br>appointments in prior 6<br>months* | 2.0 (0.0, 6.0)                  | 2.0 (0.0, 6.0)                    | 5 (2, 9)                        | 5 (2, 11)                       |
| Nitrofurantoin in prior 6<br>months                | 217,015 (5.3)                   | 130,649 (6.4)                     | 74,707 (5.9)                    | 47,900 (6.3)                    |
| Phenytoin in prior 6<br>months                     | 21,000 (0.5)                    | 7,851 (0.4)                       | 6,069 (0.5)                     | 2,466 (0.3)                     |
| Metronidazole in prior<br>6 months                 | 87,750 (2.1)                    | 51,277 (2.5)                      | 28,313 (2.2)                    | 20,004 (2.6)                    |
| Corticosteroid in prior 6<br>months                | 367,708 (9.0)                   | 243,817 (12.0)                    | 136,497 (10.8)                  | 108,875 (14.4)                  |

| Characteristic              | Aurum                           |                                   | GOLD                            |                                 |
|-----------------------------|---------------------------------|-----------------------------------|---------------------------------|---------------------------------|
|                             | Cephalosporin, N<br>= 4,088,238 | Fluoroquinolone, N<br>= 2,030,151 | Cephalosporin, N<br>= 1,263,022 | Fluoroquinolone, N<br>= 755,855 |
| Coronary heart disease      | 409,448 (10.0)                  | 207,679 (10.2)                    | 130,310 (10.3)                  | 81,415 (10.8)                   |
| Hypertension                | 991,846 (24.3)                  | 512,770 (25.3)                    | 313,812 (24.8)                  | 190,950 (25.3)                  |
| Cerebrovascular disease     | 252,876 (6.2)                   | 120,605 (5.9)                     | 77,405 (6.1)                    | 43,593 (5.8)                    |
| Dementia                    | 86,671 (2.1)                    | 29,503 (1.5)                      | 27,343 (2.2)                    | 11,006 (1.5)                    |
| Chronic liver disease       | 14,822 (0.4)                    | 12,130 (0.6)                      | 4,851 (0.4)                     | 4,527 (0.6)                     |
| Chronic kidney disease      | 669,945 (16.4)                  | 319,785 (15.8)                    | 205,270 (16.3)                  | 118,744 (15.7)                  |
| Peripheral vascular disease | 91,261 (2.2)                    | 52,828 (2.6)                      | 31,547 (2.5)                    | 21,332 (2.8)                    |
| Myocardial infarction       | 133,086 (3.3)                   | 71,186 (3.5)                      | 43,592 (3.5)                    | 30,111 (4.0)                    |
| Carotid artery disease      | 12,399 (0.3)                    | 6,743 (0.3)                       | 5,134 (0.4)                     | 3,286 (0.4)                     |
| Multiple sclerosis          | 33,293 (0.8)                    | 19,015 (0.9)                      | 11,994 (0.9)                    | 7,183 (1.0)                     |
| HSV1 infection              | 81,609 (2.0)                    | 37,958 (1.9)                      | 38,633 (3.1)                    | 19,520 (2.6)                    |
| Shingles                    | 213,983 (5.2)                   | 120,070 (5.9)                     | 82,008 (6.5)                    | 49,800 (6.6)                    |
| Rheumatoid arthritis        | 77,546 (1.9)                    | 34,528 (1.7)                      | 37,257 (2.9)                    | 18,970 (2.5)                    |

Definitions: BMI, body mass index; HSV1, herpes simplex virus 1; GP, general practitioner; IQR, interquartile range

**Appendix Table 2: Hazard ratios between fluoroquinolone use and peripheral neuropathy or tendon rupture at first treatment episode for a urinary tract infection**

| Outcome               | Method        | Aurum        |           |         | GOLD         |            |         | Pooled       |           |         |
|-----------------------|---------------|--------------|-----------|---------|--------------|------------|---------|--------------|-----------|---------|
|                       |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI     | p-value | Hazard ratio | 95% CI    | p-value |
| Peripheral neuropathy | Unadjusted    | 1.87         | 1.23-2.83 | 0.004   | 1.54         | 0.65-3.65  | 0.312   | 1.79         | 1.24-2.59 | 0.002   |
|                       | IPTW weighted | 1.35         | 0.87-2.08 | 0.180   | 1.34         | 0.55-3.29  | 0.506   | 1.34         | 0.92-1.97 | 0.131   |
| Tendon rupture        | Unadjusted    | 2.26         | 1.13-4.49 | 0.022   | 2.74         | 0.47-15.91 | 0.208   | 2.34         | 1.29-4.25 | 0.005   |
|                       | IPTW weighted | 1.56         | 0.76-3.20 | 0.213   | 1.88         | 0.30-11.89 | 0.431   | 1.62         | 0.87-3.02 | 0.131   |

Definitions: IPTW, inverse probability of treatment weight.

**Appendix Table 3: Hazard ratios between fluoroquinolone use and peripheral neuropathy or tendon rupture at all treatment episodes for a urinary tract infection**

| Outcome               | Method        | Aurum        |           |         | GOLD         |           |         | Pooled       |           |         |
|-----------------------|---------------|--------------|-----------|---------|--------------|-----------|---------|--------------|-----------|---------|
|                       |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value |
| Peripheral neuropathy | Unadjusted    | 1.92         | 1.56-2.37 | <0.001  | 1.61         | 1.08-2.42 | 0.021   | 1.85         | 1.54-2.23 | <0.001  |
|                       | IPTW weighted | 1.58         | 1.27-1.96 | <0.001  | 1.20         | 0.79-1.83 | 0.385   | 1.49         | 1.23-1.80 | <0.001  |
| Tendon rupture        | Unadjusted    | 1.88         | 1.24-2.84 | 0.003   | 2.03         | 0.68-6.00 | 0.184   | 1.90         | 1.30-2.77 | <0.001  |
|                       | IPTW weighted | 1.36         | 0.88-2.10 | 0.164   | 1.36         | 0.43-4.26 | 0.572   | 1.36         | 0.91-2.02 | 0.129   |

Definitions: IPTW, inverse probability of treatment weight.

**Appendix Table 4: Complete case analysis - hazard ratios between fluoroquinolone use and peripheral neuropathy or tendon rupture at first treatment episode**

| Outcome               | Method        | Aurum        |           |         | GOLD         |            |         | Pooled       |           |         |
|-----------------------|---------------|--------------|-----------|---------|--------------|------------|---------|--------------|-----------|---------|
|                       |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI     | p-value | Hazard ratio | 95% CI    | p-value |
| Peripheral neuropathy | Unadjusted    | 1.34         | 1.12-1.59 | 0.001   | 1.56         | 1.08-2.26  | 0.019   | 1.38         | 1.17-1.61 | <0.001  |
|                       | IPTW Weighted | 1.13         | 0.94-1.35 | 0.201   | 1.18         | 0.80-1.74  | 0.415   | 1.14         | 0.97-1.34 | 0.122   |
| Tendon rupture        | Unadjusted    | 2.48         | 1.89-3.25 | <0.001  | 5.21         | 2.46-11.04 | <0.001  | 2.70         | 2.09-3.49 | <0.001  |
|                       | IPTW Weighted | 1.98         | 1.49-2.63 | <0.001  | 4.38         | 2.03-9.45  | <0.001  | 2.16         | 1.67-2.80 | <0.001  |

Definitions: IPTW, inverse probability of treatment weight.

**Appendix Table 5: Complete case analysis - hazard ratios between fluoroquinolone use and peripheral neuropathy or tendon rupture at all treatment episodes**

| Outcome               | Method        | Aurum        |           |         | GOLD         |           |         | Pooled       |           |         |
|-----------------------|---------------|--------------|-----------|---------|--------------|-----------|---------|--------------|-----------|---------|
|                       |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value |
| Peripheral neuropathy | Unadjusted    | 1.41         | 1.27-1.56 | <0.001  | 1.51         | 1.22-1.87 | <0.001  | 1.43         | 1.30-1.56 | <0.001  |
|                       | IPTW Weighted | 1.26         | 1.13-1.40 | <0.001  | 1.19         | 0.95-1.48 | 0.136   | 1.25         | 1.14-1.37 | <0.001  |
| Tendon rupture        | Unadjusted    | 2.16         | 1.84-2.54 | <0.001  | 3.34         | 2.17-5.16 | <0.001  | 2.28         | 1.96-2.65 | <0.001  |
|                       | IPTW Weighted | 1.75         | 1.48-2.06 | <0.001  | 2.46         | 1.56-3.87 | <0.001  | 1.82         | 1.56-2.12 | <0.001  |

Definitions: IPTW, inverse probability of treatment weight.

**Appendix Table 6: Hazard ratios between fluoroquinolone use and peripheral neuropathy or tendon rupture pre-2013 first treatment episode**

| Outcome               | Method        | Aurum        |           |         | GOLD         |            |         | Pooled       |           |         |
|-----------------------|---------------|--------------|-----------|---------|--------------|------------|---------|--------------|-----------|---------|
|                       |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI     | p-value | Hazard ratio | 95% CI    | p-value |
| Peripheral neuropathy | Unadjusted    | 1.29         | 1.06-1.58 | 0.012   | 1.40         | 1.03-1.92  | 0.032   | 1.32         | 1.12-1.56 | 0.001   |
|                       | IPTW Weighted | 1.08         | 0.88-1.33 | 0.453   | 1.14         | 0.82-1.57  | 0.435   | 1.10         | 0.92-1.31 | 0.292   |
| Tendon rupture        | Unadjusted    | 2.49         | 1.81-3.43 | <0.001  | 4.87         | 2.14-11.05 | <0.001  | 2.72         | 2.02-3.66 | <0.001  |
|                       | IPTW Weighted | 2.06         | 1.48-2.87 | <0.001  | 4.04         | 1.75-9.34  | 0.001   | 2.25         | 1.66-3.04 | <0.001  |

Definitions: IPTW, inverse probability of treatment weight.

**Appendix Table 7: Hazard ratios between fluoroquinolone use and peripheral neuropathy or tendon rupture pre-2013 all treatment episodes**

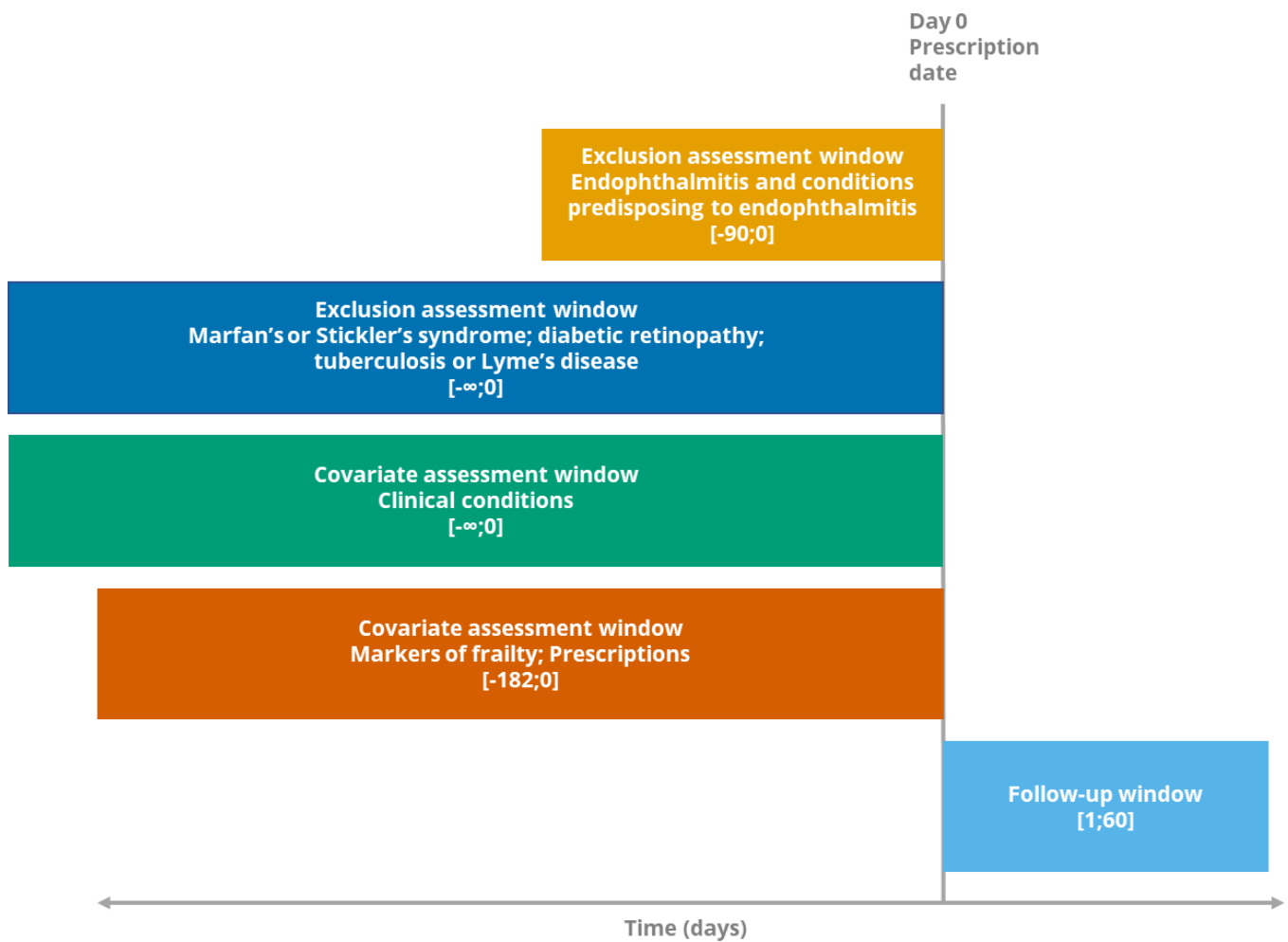
| Outcome               | Method        | Aurum        |           |         | GOLD         |           |         | Pooled       |           |         |
|-----------------------|---------------|--------------|-----------|---------|--------------|-----------|---------|--------------|-----------|---------|
|                       |               | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value | Hazard ratio | 95% CI    | p-value |
| Peripheral neuropathy | Unadjusted    | 1.32         | 1.17-1.48 | <0.001  | 1.40         | 1.16-1.68 | <0.001  | 1.34         | 1.22-1.48 | <0.001  |
|                       | IPTW Weighted | 1.18         | 1.04-1.33 | 0.009   | 1.14         | 0.94-1.38 | 0.180   | 1.17         | 1.05-1.29 | 0.003   |
| Tendon rupture        | Unadjusted    | 2.11         | 1.74-2.56 | <0.001  | 3.20         | 2.00-5.13 | <0.001  | 2.24         | 1.87-2.68 | <0.001  |
|                       | IPTW Weighted | 1.74         | 1.43-2.12 | <0.001  | 2.35         | 1.44-3.84 | <0.001  | 1.82         | 1.52-2.18 | <0.001  |

Definitions: IPTW, inverse probability of treatment weight.



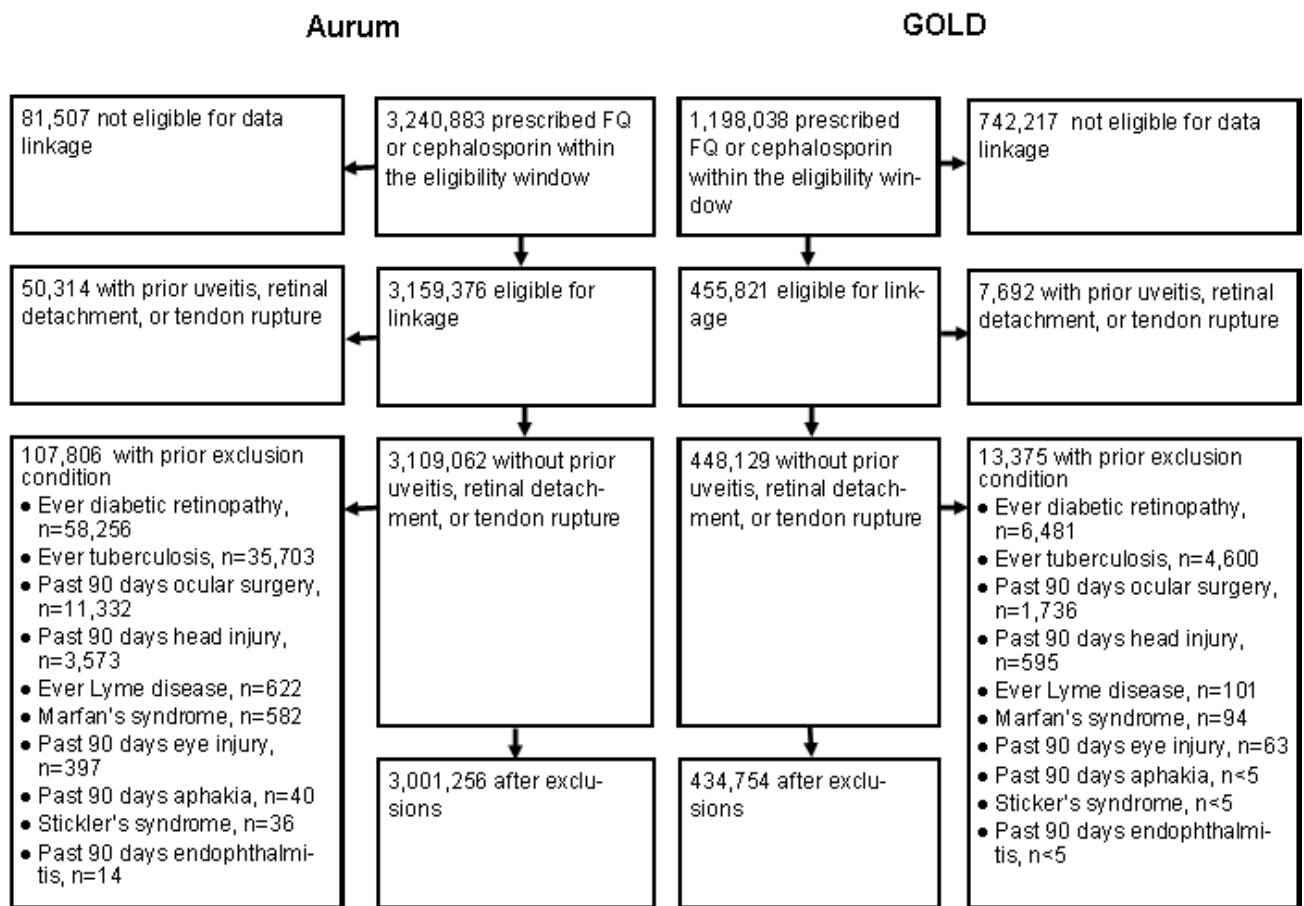
**APPENDIX 5: SUPPLEMENTARY INFORMATION FOR  
MANUSCRIPT ON ASSOCIATIONS OF  
FLUOROQUINOLONES WITH UVEITIS AND RETINAL  
DETACHMENT**

## Figures

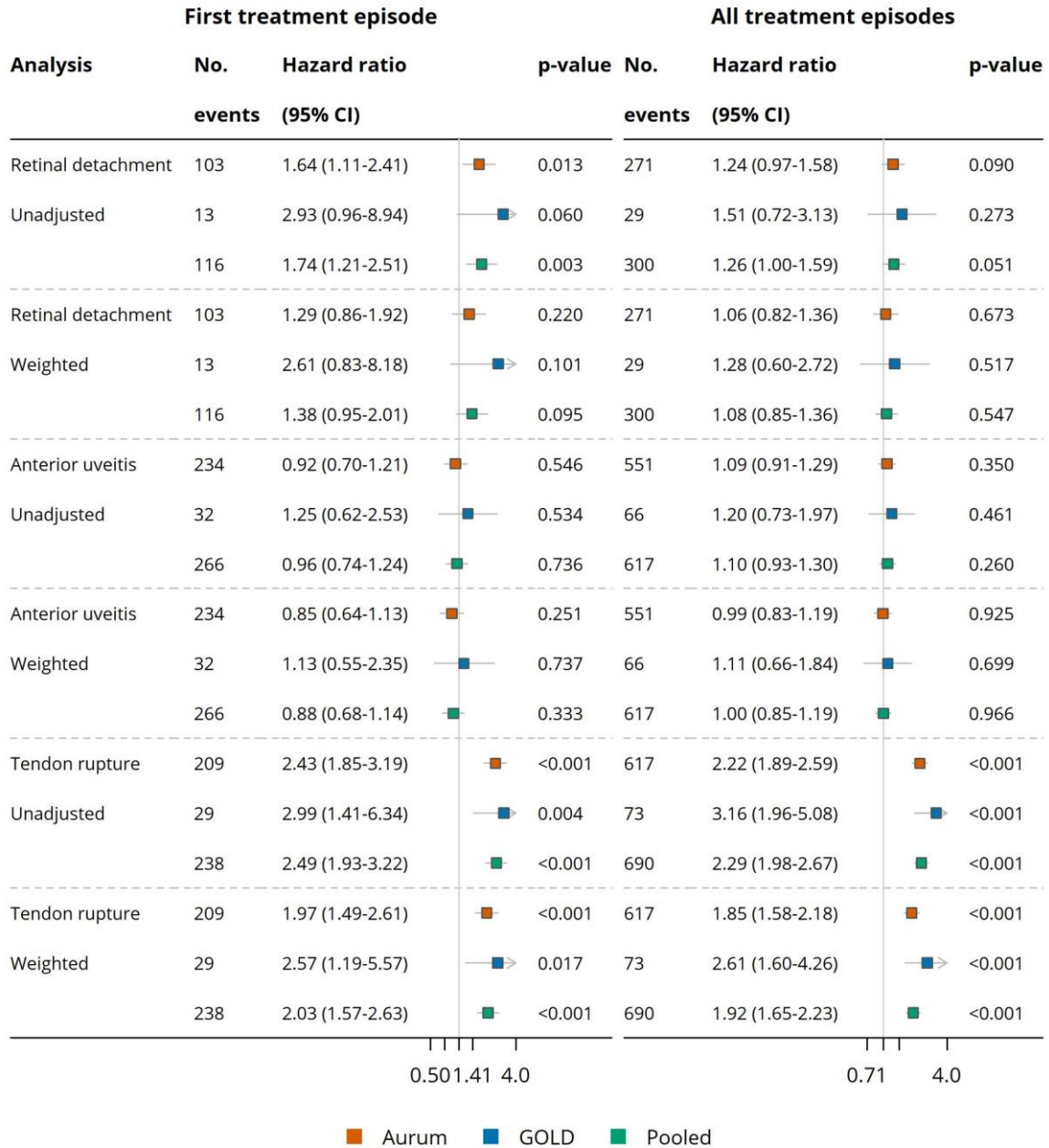


**Appendix Figure 1: Graphical depiction of cohort design**

Treatment episodes within the eligibility window of fluoroquinolone or cephalosporins among adults (aged 18+ years) were included if the individual had no exclusion criteria conditions prior to prescription. Multiple treatment episodes were included per person if present.

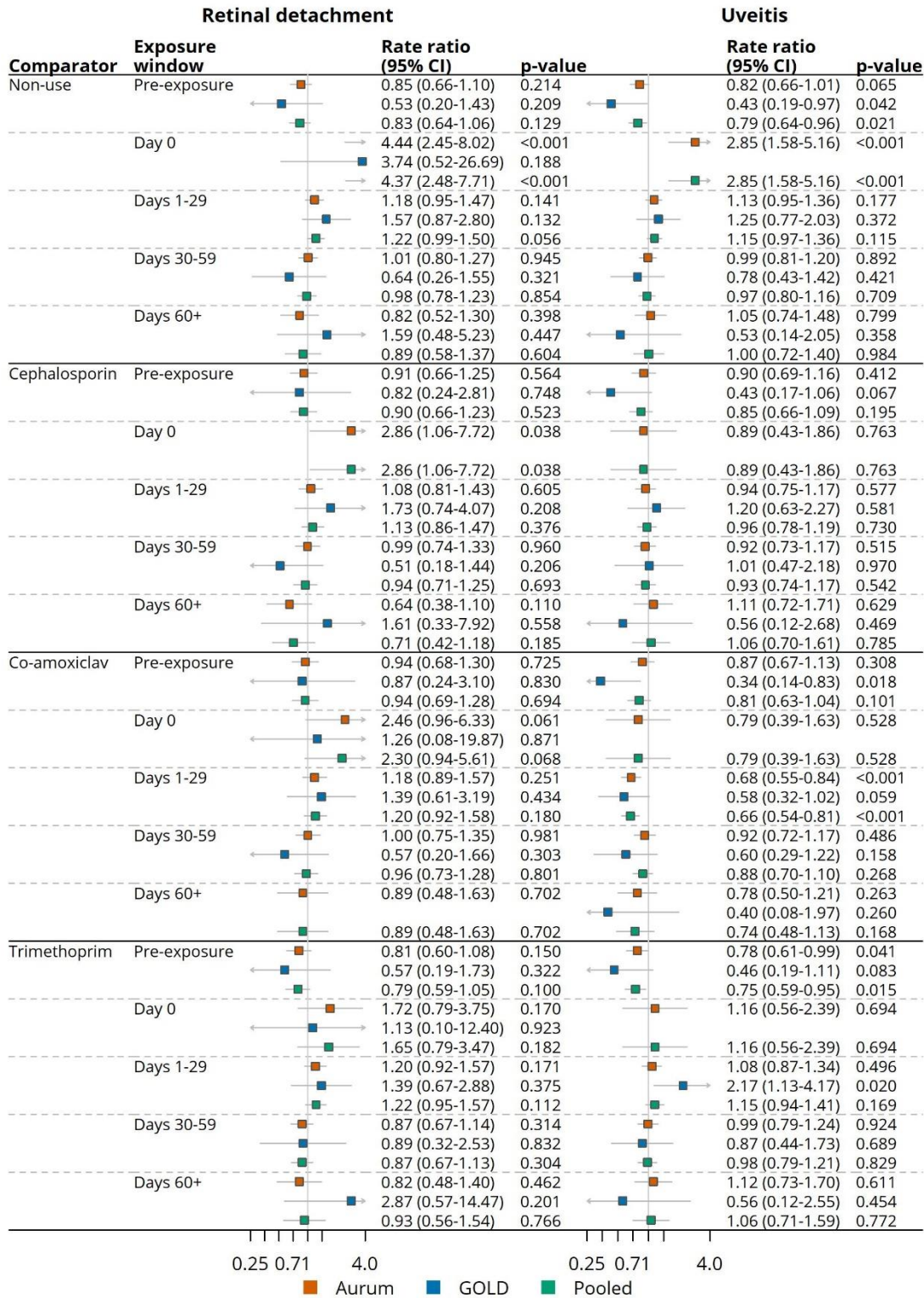


***Appendix Figure 2: Flow chart of individuals included in cohort studies***



**Appendix Figure 3: Cohort studies - Hazard ratios comparing risk of anterior uveitis and retinal detachment with or without subsequent operation, following exposure to fluoroquinolone, relative to cephalosporin prescription**

Definitions: CI, confidence interval.



***Appendix Figure 4: Self-controlled case series - Rate ratios for anterior uveitis and retinal detachment, with or without subsequent operation, comparing fluoroquinolone use to non-use or to use of comparator antibiotics***

Definitions: CI, confidence interval.

## Tables

***Appendix Table 1: Cohort studies - Baseline characteristics of fluoroquinolone and cephalosporin users at first treatment episode***

| Characteristic                        | Aurum                        |                                | GOLD                       |                              |
|---------------------------------------|------------------------------|--------------------------------|----------------------------|------------------------------|
|                                       | Cephalosporin, N = 4,266,152 | Fluoroquinolone, N = 2,131,292 | Cephalosporin, N = 577,082 | Fluoroquinolone, N = 309,349 |
| Age, median (IQR)                     | 57 (39, 73)                  | 58 (42, 72)                    | 58 (40, 74)                | 59 (44, 73)                  |
| Female                                | 3,182,804 (74.6)             | 1,135,965 (53.3)               | 429,822 (74.5)             | 169,979 (54.9)               |
| Calendar year                         |                              |                                |                            |                              |
| 1997-2001                             | 1,009,432 (23.7)             | 374,260 (17.6)                 | 113,448 (19.7)             | 45,902 (14.8)                |
| 2002-2006                             | 1,472,491 (34.5)             | 580,988 (27.3)                 | 227,632 (39.4)             | 101,946 (33.0)               |
| 2007-2011                             | 1,164,727 (27.3)             | 582,142 (27.3)                 | 183,296 (31.8)             | 103,335 (33.4)               |
| 2012-2016                             | 478,286 (11.2)               | 413,609 (19.4)                 | 45,565 (7.9)               | 47,214 (15.3)                |
| 2017-2019                             | 141,216 (3.3)                | 180,293 (8.5)                  | 7,141 (1.2)                | 10,952 (3.5)                 |
| Ethnicity                             |                              |                                |                            |                              |
| White                                 | 3,753,088 (92.1)             | 1,892,313 (92.9)               | 519,390 (95.9)             | 280,813 (96.3)               |
| South Asian                           | 181,659 (4.5)                | 76,941 (3.8)                   | 11,545 (2.1)               | 5,182 (1.8)                  |
| Black                                 | 82,033 (2.0)                 | 38,649 (1.9)                   | 4,383 (0.8)                | 2,435 (0.8)                  |
| Other                                 | 35,505 (0.9)                 | 16,423 (0.8)                   | 4,569 (0.8)                | 2,103 (0.7)                  |
| Mixed                                 | 23,761 (0.6)                 | 11,741 (0.6)                   | 1,807 (0.3)                | 1,013 (0.3)                  |
| Missing                               | 190,106                      | 95,225                         | 35,388                     | 17,803                       |
| Below 10th percentile Carstairs Index | 210,437 (4.9)                | 116,645 (5.5)                  | 21,076 (3.7)               | 13,713 (4.4)                 |
| BMI, median (IQR)                     | 28 (25, 32)                  | 28 (25, 32)                    | 25.8 (22.7, 29.6)          | 26.1 (23.1, 29.7)            |
| Missing                               | 742,807                      | 375,798                        | 53,017                     | 27,716                       |
| Current smoker                        | 1,424,863 (33.4)             | 682,830 (32.0)                 | 190,556 (33.0)             | 96,139 (31.1)                |
| Heavy drinker                         | 86,878 (2.0)                 | 61,506 (2.9)                   | 10,091 (1.7)               | 7,724 (2.5)                  |
| Prior 6 months                        |                              |                                |                            |                              |
| Number of GP appointments             | 2.0 (0.0, 6.0)               | 2.0 (0.0, 6.0)                 | 5 (2, 10)                  | 6 (3, 11)                    |
| Hospitalised                          | 870,638 (20.4)               | 491,496 (23.1)                 | 118,130 (20.5)             | 72,020 (23.3)                |
| Corticosteroid use                    | 471,352 (11.0)               | 299,635 (14.1)                 | 73,432 (12.7)              | 51,753 (16.7)                |
| Ever prior                            |                              |                                |                            |                              |
| Coronary heart disease                | 482,062 (11.3)               | 245,766 (11.5)                 | 66,494 (11.5)              | 36,987 (12.0)                |

| Characteristic                | Aurum                           |                                   | GOLD                          |                                 |
|-------------------------------|---------------------------------|-----------------------------------|-------------------------------|---------------------------------|
|                               | Cephalosporin, N<br>= 4,266,152 | Fluoroquinolone, N<br>= 2,131,292 | Cephalosporin, N<br>= 577,082 | Fluoroquinolone, N<br>= 309,349 |
| Hypertension                  | 1,143,084 (26.8)                | 593,768 (27.9)                    | 153,282 (26.6)                | 86,005 (27.8)                   |
| Diabetes                      | 342,900 (8.0)                   | 181,923 (8.5)                     | 79,699 (13.8)                 | 44,872 (14.5)                   |
| Uncontrolled diabetes         | 197,924 (4.6)                   | 106,313 (5.0)                     | 27,628 (4.8)                  | 16,581 (5.4)                    |
| Cerebrovascular disease       | 288,365 (6.8)                   | 138,888 (6.5)                     | 39,459 (6.8)                  | 19,672 (6.4)                    |
| Dementia                      | 94,991 (2.2)                    | 33,081 (1.6)                      | 12,571 (2.2)                  | 4,133 (1.3)                     |
| HIV                           | 2,903 (0.1)                     | 3,157 (0.1)                       | 267 (0.0)                     | 236 (0.1)                       |
| Chronic liver disease         | 18,807 (0.4)                    | 15,378 (0.7)                      | 2,076 (0.4)                   | 1,749 (0.6)                     |
| Chronic kidney disease        | 778,880 (18.3)                  | 374,983 (17.6)                    | 114,249 (19.8)                | 60,829 (19.7)                   |
| Peripheral vascular disease   | 112,341 (2.6)                   | 65,858 (3.1)                      | 17,210 (3.0)                  | 10,225 (3.3)                    |
| Myocardial infarction         | 158,518 (3.7)                   | 85,180 (4.0)                      | 22,411 (3.9)                  | 13,077 (4.2)                    |
| Carotid artery disease        | 14,524 (0.3)                    | 8,080 (0.4)                       | 2,199 (0.4)                   | 1,320 (0.4)                     |
| Multiple sclerosis            | 36,580 (0.9)                    | 21,111 (1.0)                      | 5,318 (0.9)                   | 3,038 (1.0)                     |
| Cataract                      | 408,553 (9.6)                   | 205,683 (9.7)                     | 56,266 (9.8)                  | 30,082 (9.7)                    |
| Glaucoma                      | 105,300 (2.5)                   | 53,687 (2.5)                      | 15,148 (2.6)                  | 8,363 (2.7)                     |
| Posterior vitreous detachment | 40,157 (0.9)                    | 24,059 (1.1)                      | 5,382 (0.9)                   | 3,550 (1.1)                     |
| HSV1 infection                | 85,048 (2.0)                    | 40,102 (1.9)                      | 18,724 (3.2)                  | 9,187 (3.0)                     |
| Rheumatoid arthritis          | 86,197 (2.0)                    | 38,712 (1.8)                      | 17,454 (3.0)                  | 8,326 (2.7)                     |

Main value in each table cell is number of patients, and value in brackets is percentage of individuals, except for age and BMI where median and interquartile range are presented.

Definitions: BMI, body mass index; GP, general practitioner; HSV1, herpes simplex virus 1; HIV, human immunodeficiency virus; IQR, interquartile range.

***Appendix Table 2: Fluoroquinolones and cephalosporins prescribed at first treatment episode***

| Prescribed medication | Aurum                        |                              | GOLD                       |                              |
|-----------------------|------------------------------|------------------------------|----------------------------|------------------------------|
|                       | Cephalosporin, N = 1,642,125 | Fluoroquinolone, N = 839,647 | Cephalosporin, N = 234,158 | Fluoroquinolone, N = 126,772 |
| Cefaclor              | 221,848 (13.5)               | 0 (0.0)                      | 36,659 (15.7)              | 0 (0.0)                      |
| Cefadroxil            | 59,256 (3.6)                 | 0 (0.0)                      | 5,265 (2.2)                | 0 (0.0)                      |
| Cefalexin             | 1,189,763 (72.5)             | 0 (0.0)                      | 166,337 (71.0)             | 0 (0.0)                      |
| Cefamandole           | 1 (<0.1)                     | 0 (0.0)                      |                            |                              |
| Cefixime              | 10,988 (0.7)                 | 0 (0.0)                      | 1,111 (0.5)                | 0 (0.0)                      |
| Cefotaxime            | 156 (<0.1)                   | 0 (0.0)                      | 11 (<0.1)                  | 0 (0.0)                      |
| Cefpodoxime           | 732 (<0.1)                   | 0 (0.0)                      | 41 (<0.1)                  | 0 (0.0)                      |
| Cefradine             | 134,824 (8.2)                | 0 (0.0)                      | 21,900 (9.4)               | 0 (0.0)                      |
| Ceftazidime           | 107 (<0.1)                   | 0 (0.0)                      | 11 (<0.1)                  | 0 (0.0)                      |
| Ceftibuten            | 28 (<0.1)                    | 0 (0.0)                      | 4 (<0.1)                   | 0 (0.0)                      |
| Ceftriaxone           | 1,807 (0.1)                  | 0 (0.0)                      | 136 (<0.1)                 | 0 (0.0)                      |
| Cefuroxime            | 22,615 (1.4)                 | 0 (0.0)                      | 2,683 (1.1)                | 0 (0.0)                      |
| Ciprofloxacin         | 0 (0.0)                      | 733,842 (87.4)               | 0 (0.0)                    | 110,438 (87.1)               |
| Levofloxacin          | 0 (0.0)                      | 18,092 (2.2)                 | 0 (0.0)                    | 2,543 (2.0)                  |
| Moxifloxacin          | 0 (0.0)                      | 3,332 (0.4)                  | 0 (0.0)                    | 432 (0.3)                    |
| Norfloxacin           | 0 (0.0)                      | 31,827 (3.8)                 | 0 (0.0)                    | 7,398 (5.8)                  |
| Ofloxacin             | 0 (0.0)                      | 52,554 (6.3)                 | 0 (0.0)                    | 5,961 (4.7)                  |

Main value in each table cell is number of patients, and value in brackets is percentage of individuals, except for age and BMI where median and interquartile range are presented.



***Appendix Table 3: Fluoroquinolones and cephalosporins prescribed at all treatment episodes***

| Prescribed medication | Aurum                        |                                | GOLD                       |                              |
|-----------------------|------------------------------|--------------------------------|----------------------------|------------------------------|
|                       | Cephalosporin, N = 3,813,463 | Fluoroquinolone, N = 1,886,815 | Cephalosporin, N = 512,179 | Fluoroquinolone, N = 273,633 |
| Cefaclor              | 454,394 (11.9)               | 0 (0.0)                        | 73,720 (14.4)              | 0 (0.0)                      |
| Cefadroxil            | 124,835 (3.3)                | 0 (0.0)                        | 10,258 (2.0)               | 0 (0.0)                      |
| Cefalexin             | 2,871,824 (75.3)             | 0 (0.0)                        | 374,309 (73.1)             | 0 (0.0)                      |
| Cefamandole           | 1 (<0.1)                     | 0 (0.0)                        |                            |                              |
| Cefixime              | 23,024 (0.6)                 | 0 (0.0)                        | 2,001 (0.4)                | 0 (0.0)                      |
| Cefotaxime            | 301 (<0.1)                   | 0 (0.0)                        | 23 (<0.1)                  | 0 (0.0)                      |
| Cefoxitin             | 1 (<0.1)                     | 0 (0.0)                        |                            |                              |
| Cefpodoxime           | 1,579 (<0.1)                 | 0 (0.0)                        | 97 (<0.1)                  | 0 (0.0)                      |
| Cefradine             | 284,764 (7.5)                | 0 (0.0)                        | 46,202 (9.0)               | 0 (0.0)                      |
| Ceftazidime           | 486 (<0.1)                   | 0 (0.0)                        | 36 (<0.1)                  | 0 (0.0)                      |
| Ceftibuten            | 55 (<0.1)                    | 0 (0.0)                        | 10 (<0.1)                  | 0 (0.0)                      |
| Ceftizoxime           | 1 (<0.1)                     | 0 (0.0)                        |                            |                              |
| Ceftriaxone           | 3,151 (<0.1)                 | 0 (0.0)                        | 236 (<0.1)                 | 0 (0.0)                      |
| Cefuroxime            | 49,047 (1.3)                 | 0 (0.0)                        | 5,287 (1.0)                | 0 (0.0)                      |
| Ciprofloxacin         | 0 (0.0)                      | 1,652,168 (87.6)               | 0 (0.0)                    | 237,156 (86.7)               |
| Levofloxacin          | 0 (0.0)                      | 50,050 (2.7)                   | 0 (0.0)                    | 6,874 (2.5)                  |
| Moxifloxacin          | 0 (0.0)                      | 11,030 (0.6)                   | 0 (0.0)                    | 1,228 (0.4)                  |
| Norfloxacin           | 0 (0.0)                      | 75,995 (4.0)                   | 0 (0.0)                    | 16,994 (6.2)                 |
| Ofloxacin             | 0 (0.0)                      | 97,572 (5.2)                   | 0 (0.0)                    | 11,381 (4.2)                 |

Main value in each table cell is number of patients, and value in brackets is percentage of individuals, except for age and BMI where median and interquartile range are presented.

**Appendix Table 4: Cohort studies - Risk differences between fluoroquinolone and cephalosporin users for uveitis, retinal detachment, and tendon rupture at all treatment episodes**

| Outcome            | Analysis      | Aurum          |             |         | GOLD           |             |         | Pooled         |             |         |
|--------------------|---------------|----------------|-------------|---------|----------------|-------------|---------|----------------|-------------|---------|
|                    |               | RD per 100,000 | 95% CI      | p-value | RD per 100,000 | 95% CI      | p-value | RD per 100,000 | 95% CI      | p-value |
| Uveitis            | Unadjusted    | 1.66           | -0.37, 3.68 | 0.108   | 2.23           | -2.95, 7.40 | 0.398   | 1.73           | -0.15, 3.61 | 0.071   |
|                    | IPTW weighted | 0.51           | -1.50, 2.51 | 0.621   | 1.08           | -4.07, 6.23 | 0.681   | 0.58           | -1.29, 2.45 | 0.542   |
| Retinal detachment | Unadjusted    | 0.94           | -0.05, 1.93 | 0.064   | 1.52           | -1.10, 4.13 | 0.256   | 1.01           | 0.08, 1.94  | 0.033   |
|                    | IPTW weighted | 0.44           | -0.52, 1.41 | 0.370   | 0.98           | -1.38, 3.34 | 0.415   | 0.52           | -0.37, 1.42 | 0.255   |
| Tendon rupture     | Unadjusted    | 10.48          | 8.17, 12.79 | <0.001  | 13.08          | 7.09, 19.06 | <0.001  | 10.82          | 8.66, 12.97 | <0.001  |
|                    | IPTW weighted | 7.96           | 5.71-10.21  | <0.001  | 10.40          | 4.71-16.09  | <0.001  | 8.29           | 6.20-10.38  | <0.001  |

Definitions: RD, risk difference; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 5: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at first treatment episode – excluding cases with cataract surgery within 30 days**

| Outcome            | Analysis      | Aurum |           |         | GOLD |            |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|------------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI     | P-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.03  | 0.80-1.33 | 0.808   | 1.57 | 0.84-2.94  | 0.161   | 1.10   | 0.86-1.39 | 0.452   |
|                    | IPTW weighted | 0.95  | 0.72-1.24 | 0.687   | 1.44 | 0.75-2.77  | 0.271   | 1.01   | 0.79-1.28 | 0.955   |
| Retinal detachment | Unadjusted    | 1.68  | 0.92-3.05 | 0.091   | 4.57 | 0.89-23.58 | 0.069   | 1.89   | 1.07-3.31 | 0.027   |
|                    | IPTW weighted | 1.25  | 0.67-2.33 | 0.483   | 4.53 | 0.84-24.34 | 0.078   | 1.43   | 0.80-2.57 | 0.229   |
| Tendon rupture     | Unadjusted    | 2.47  | 1.89-3.22 | <0.001  | 3.33 | 1.59-6.94  | 0.001   | 2.56   | 1.99-3.29 | <0.001  |
|                    | IPTW weighted | 1.97  | 1.49-2.60 | <0.001  | 2.80 | 1.31-5.98  | 0.008   | 2.05   | 1.59-2.64 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 6: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at all treatment episodes – excluding cases with cataract surgery within 30 days**

| Outcome            | Analysis      | Aurum |           |         | GOLD |           |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|-----------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI    | p-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.20  | 1.01-1.42 | 0.036   | 1.38 | 0.88-2.19 | 0.164   | 1.22   | 1.04-1.43 | 0.014   |
|                    | IPTW weighted | 1.10  | 0.92-1.31 | 0.290   | 1.32 | 0.82-2.12 | 0.252   | 1.13   | 0.96-1.32 | 0.152   |
| Retinal detachment | Unadjusted    | 1.36  | 0.94-1.95 | 0.104   | 1.63 | 0.59-4.49 | 0.347   | 1.38   | 0.98-1.95 | 0.064   |
|                    | IPTW weighted | 1.13  | 0.77-1.65 | 0.544   | 1.40 | 0.49-4.01 | 0.533   | 1.15   | 0.81-1.65 | 0.433   |
| Tendon rupture     | Unadjusted    | 2.21  | 1.89-2.59 | <0.001  | 3.37 | 2.11-5.40 | <0.001  | 2.31   | 1.99-2.68 | <0.001  |
|                    | IPTW weighted | 1.84  | 1.57-2.16 | <0.001  | 2.73 | 1.68-4.44 | <0.001  | 1.92   | 1.65-2.22 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 7: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at first treatment episode – among individuals with a urinary tract infection within two weeks prior**

| Outcome            | Analysis      | Aurum |            |         | GOLD |            |         | Pooled |           |         |
|--------------------|---------------|-------|------------|---------|------|------------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI     | p-value | HR   | 95% CI     | P-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 0.86  | 0.39-1.88  | 0.697   | 2.95 | 0.42-20.97 | 0.279   | 1.02   | 0.49-2.11 | 0.967   |
|                    | IPTW weighted | 0.75  | 0.33-1.70  | 0.489   | 3.12 | 0.43-22.46 | 0.259   | 0.96   | 0.45-2.05 | 0.925   |
| Retinal detachment | Unadjusted    | 2.24  | 0.50-10.03 | 0.290   | 2.96 | 0.18-47.26 | 0.443   | 2.39   | 0.64-8.92 | 0.195   |
|                    | IPTW weighted | 1.70  | 0.37-7.78  | 0.491   | 1.95 | 0.12-31.13 | 0.637   | 1.75   | 0.42-7.19 | 0.440   |
| Tendon rupture     | Unadjusted    | 1.69  | 0.86-3.34  | 0.129   | 8.86 | 0.92-85.22 | 0.059   | 1.94   | 1.01-3.72 | 0.046   |
|                    | IPTW weighted | 1.26  | 0.63-2.53  | 0.508   | 7.53 | 0.76-74.23 | 0.084   | 1.46   | 0.74-2.89 | 0.272   |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 8: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at all treatment episodes – among individuals with a urinary tract infection within two weeks prior**

| Outcome            | Analysis      | Aurum |           |         | GOLD |            |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|------------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI     | P-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.02  | 0.65-1.61 | 0.932   | 1.86 | 0.53-6.61  | 0.334   | 1.09   | 0.71-1.68 | 0.683   |
|                    | IPTW weighted | 0.90  | 0.56-1.45 | 0.670   | 1.95 | 0.54-7.12  | 0.311   | 1.01   | 0.65-1.57 | 0.980   |
| Retinal detachment | Unadjusted    | 1.45  | 0.58-3.59 | 0.424   | 2.80 | 0.18-44.75 | 0.467   | 1.54   | 0.65-3.66 | 0.324   |
|                    | IPTW weighted | 1.17  | 0.46-3.01 | 0.741   | 1.90 | 0.12-30.45 | 0.649   | 1.22   | 0.49-3.03 | 0.673   |
| Tendon rupture     | Unadjusted    | 1.85  | 1.24-2.77 | 0.003   | 3.50 | 0.94-13.03 | 0.062   | 1.96   | 1.33-2.87 | <0.001  |
|                    | IPTW weighted | 1.47  | 0.97-2.22 | 0.067   | 2.56 | 0.66-9.93  | 0.174   | 1.54   | 1.04-2.29 | 0.031   |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 9: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at first treatment episode – limited to first prescriptions only**

| Outcome            | Analysis      | Aurum |           |         | GOLD |            |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|------------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI     | P-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.01  | 0.76-1.35 | 0.937   | 1.33 | 0.62-2.85  | 0.457   | 1.05   | 0.80-1.37 | 0.736   |
|                    | IPTW weighted | 0.93  | 0.69-1.25 | 0.627   | 1.07 | 0.49-2.33  | 0.868   | 0.95   | 0.72-1.24 | 0.686   |
| Retinal detachment | Unadjusted    | 1.69  | 0.92-3.09 | 0.091   | 4.17 | 0.81-21.48 | 0.088   | 1.88   | 1.06-3.32 | 0.029   |
|                    | IPTW weighted | 1.25  | 0.67-2.35 | 0.480   | 4.35 | 0.81-23.27 | 0.086   | 1.43   | 0.79-2.60 | 0.233   |
| Tendon rupture     | Unadjusted    | 2.42  | 1.79-3.26 | <0.001  | 3.13 | 1.33-7.37  | 0.009   | 2.48   | 1.87-3.29 | <0.001  |
|                    | IPTW weighted | 1.95  | 1.43-2.65 | <0.001  | 2.71 | 1.12-6.55  | 0.027   | 2.02   | 1.52-2.68 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 10: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at first treatment episode – excluding individuals with diabetes**

| Outcome            | Analysis      | Aurum |           |         | GOLD |            |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|------------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI     | P-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 0.99  | 0.75-1.31 | 0.932   | 1.41 | 0.68-2.90  | 0.354   | 1.03   | 0.80-1.35 | 0.797   |
|                    | IPTW weighted | 0.91  | 0.68-1.22 | 0.541   | 1.27 | 0.60-2.68  | 0.538   | 0.95   | 0.73-1.24 | 0.722   |
| Retinal detachment | Unadjusted    | 1.78  | 0.97-3.27 | 0.061   | 5.52 | 0.57-53.06 | 0.139   | 1.92   | 1.07-3.45 | 0.028   |
|                    | IPTW weighted | 1.30  | 0.69-2.42 | 0.417   | 4.41 | 0.46-42.45 | 0.199   | 1.39   | 0.75-2.56 | 0.290   |
| Tendon rupture     | Unadjusted    | 2.63  | 1.97-3.52 | <0.001  | 3.91 | 1.69-9.06  | 0.001   | 2.75   | 2.09-3.62 | <0.001  |
|                    | IPTW weighted | 2.19  | 1.62-2.96 | <0.001  | 3.27 | 1.38-7.77  | 0.007   | 2.29   | 1.73-3.01 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 11: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at all treatment episodes – excluding individuals with diabetes**

| Outcome            | Analysis      | Aurum |           |         | GOLD |           |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|-----------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI    | p-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.15  | 0.96-1.38 | 0.131   | 1.04 | 0.60-1.80 | 0.885   | 1.14   | 0.96-1.36 | 0.140   |
|                    | IPTW weighted | 1.04  | 0.86-1.26 | 0.654   | 0.95 | 0.54-1.68 | 0.864   | 1.03   | 0.87-1.24 | 0.707   |
| Retinal detachment | Unadjusted    | 1.63  | 1.11-2.38 | 0.012   | 2.25 | 0.69-7.37 | 0.181   | 1.68   | 1.17-2.41 | 0.005   |
|                    | IPTW weighted | 1.34  | 0.91-1.99 | 0.142   | 1.66 | 0.50-5.54 | 0.410   | 1.37   | 0.95-1.98 | 0.096   |
| Tendon rupture     | Unadjusted    | 2.26  | 1.91-2.68 | <0.001  | 3.85 | 2.22-6.66 | <0.001  | 2.37   | 2.02-2.78 | <0.001  |
|                    | IPTW weighted | 1.88  | 1.58-2.24 | <0.001  | 2.93 | 1.66-5.16 | <0.001  | 1.96   | 1.66-2.30 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 12: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at first treatment episode – oral prescriptions only**

| Outcome            | Analysis      | Aurum |           |         | GOLD |            |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|------------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI     | p-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 0.99  | 0.76-1.29 | 0.943   | 1.28 | 0.65-2.53  | 0.480   | 1.02   | 0.80-1.31 | 0.852   |
|                    | IPTW weighted | 0.89  | 0.68-1.18 | 0.427   | 1.13 | 0.56-2.29  | 0.741   | 0.92   | 0.72-1.18 | 0.526   |
| Retinal detachment | Unadjusted    | 1.71  | 0.97-3.04 | 0.066   | 4.57 | 0.89-23.55 | 0.069   | 1.91   | 1.11-3.27 | 0.020   |
|                    | IPTW weighted | 1.25  | 0.69-2.26 | 0.460   | 4.55 | 0.85-24.35 | 0.076   | 1.42   | 0.81-2.49 | 0.223   |
| Tendon rupture     | Unadjusted    | 2.43  | 1.85-3.19 | <0.001  | 2.99 | 1.41-6.33  | 0.004   | 2.49   | 1.92-3.21 | <0.001  |
|                    | IPTW weighted | 1.96  | 1.48-2.60 | <0.001  | 2.57 | 1.19-5.56  | 0.017   | 2.02   | 1.56-2.62 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 13: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at all treatment episodes – oral prescriptions only**

| Outcome            | Analysis      | Aurum |           |         | GOLD |           |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|-----------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI    | p-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.15  | 0.97-1.37 | 0.096   | 1.23 | 0.77-1.99 | 0.389   | 1.16   | 0.99-1.36 | 0.063   |
|                    | IPTW weighted | 1.05  | 0.88-1.25 | 0.601   | 1.11 | 0.68-1.82 | 0.682   | 1.05   | 0.90-1.24 | 0.523   |
| Retinal detachment | Unadjusted    | 1.43  | 1.01-2.03 | 0.044   | 1.85 | 0.69-4.93 | 0.218   | 1.47   | 1.06-2.05 | 0.021   |
|                    | IPTW weighted | 1.20  | 0.83-1.72 | 0.333   | 1.56 | 0.57-4.31 | 0.386   | 1.23   | 0.88-1.72 | 0.228   |
| Tendon rupture     | Unadjusted    | 2.21  | 1.89-2.59 | <0.001  | 3.15 | 1.96-5.07 | <0.001  | 2.29   | 1.97-2.66 | <0.001  |
|                    | IPTW weighted | 1.85  | 1.57-2.18 | <0.001  | 2.61 | 1.60-4.25 | <0.001  | 1.91   | 1.65-2.23 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 14: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at all treatment episodes– ciprofloxacin or cephalosporins only**

| Outcome            | Analysis      | Aurum |           |         | GOLD |            |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|------------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI     | p-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.00  | 0.76-1.31 | 0.981   | 1.05 | 0.49-2.24  | 0.901   | 1.00   | 0.77-1.30 | 0.984   |
|                    | IPTW weighted | 0.90  | 0.68-1.21 | 0.498   | 0.97 | 0.44-2.16  | 0.942   | 0.91   | 0.70-1.19 | 0.494   |
| Retinal detachment | Unadjusted    | 1.69  | 0.93-3.07 | 0.085   | 5.25 | 1.02-27.05 | 0.048   | 1.93   | 1.10-3.38 | 0.022   |
|                    | IPTW weighted | 1.24  | 0.66-2.30 | 0.504   | 4.96 | 0.92-26.64 | 0.062   | 1.43   | 0.80-2.57 | 0.229   |
| Tendon rupture     | Unadjusted    | 2.39  | 1.80-3.17 | <0.001  | 3.05 | 1.42-6.58  | 0.004   | 2.46   | 1.89-3.21 | <0.001  |
|                    | IPTW weighted | 1.94  | 1.45-2.60 | <0.001  | 2.43 | 1.10-5.36  | 0.028   | 1.99   | 1.52-2.60 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

**Appendix Table 15: Cohort studies - Hazard ratios comparing risk of uveitis, retinal detachment and tendon rupture after fluoroquinolone prescription, relative to cephalosporin prescription, at all treatment episodes– ciprofloxacin or cephalosporins only**

| Outcome            | Analysis      | Aurum |           |         | GOLD |           |         | Pooled |           |         |
|--------------------|---------------|-------|-----------|---------|------|-----------|---------|--------|-----------|---------|
|                    |               | HR    | 95% CI    | p-value | HR   | 95% CI    | p-value | HR     | 95% CI    | p-value |
| Uveitis            | Unadjusted    | 1.19  | 1.00-1.42 | 0.052   | 1.07 | 0.63-1.80 | 0.806   | 1.18   | 1.00-1.39 | 0.054   |
|                    | IPTW weighted | 1.08  | 0.90-1.30 | 0.400   | 0.95 | 0.55-1.64 | 0.855   | 1.07   | 0.90-1.26 | 0.450   |
| Retinal detachment | Unadjusted    | 1.43  | 1.00-2.05 | 0.051   | 2.14 | 0.80-5.69 | 0.129   | 1.50   | 1.07-2.11 | 0.018   |
|                    | IPTW weighted | 1.16  | 0.80-1.70 | 0.428   | 1.74 | 0.63-4.81 | 0.283   | 1.22   | 0.86-1.73 | 0.269   |
| Tendon rupture     | Unadjusted    | 2.11  | 1.79-2.49 | <0.001  | 3.09 | 1.89-5.04 | <0.001  | 2.19   | 1.88-2.56 | <0.001  |
|                    | IPTW weighted | 1.74  | 1.47-2.07 | <0.001  | 2.53 | 1.52-4.19 | <0.001  | 1.81   | 1.54-2.12 | <0.001  |

Definitions: HR, hazard ratio; IPTW, inverse probability of treatment weighting; CI, confidence interval.

# APPENDIX 6: CODE LISTS FOR STUDIES INVESTIGATING ASSOCIATION BETWEEN FLUOROQUINOLONE PRESCRIBING AND UVEITIS, RETINAL DETACHMENT, AND PERIPHERAL NEUROPATHY

## Clinical code lists in Aurum

| <b>Condition</b> | <b>medcodeid</b> | <b>Term</b>  |
|------------------|------------------|--|
| Amyloidosis      | 3288141000006110 | Renal amyloidosis  |
| Amyloidosis      | 38839013         | AL amyloidosis   |
| Amyloidosis      | 2214111000000110 | Amyloid A amyloidosis                                      |
| Amyloidosis      | 65019016         | Bullous cutaneous amyloidosis                              |
| Amyloidosis      | 75861010         | Cerebrovascular amyloidosis                                |
| Amyloidosis      | 28038011         | Senile cardiac amyloidosis                                 |
| Amyloidosis      | 309291013        | Amyloidosis of skin  |
| Amyloidosis      | 2211411000000110 | Amyloidosis of intestine                                   |
| Amyloidosis      | 293566016        | Primary amyloidosis NEC                                    |
| Amyloidosis      | 293570012        | Other specified amyloidosis                                |
| Amyloidosis      | 1870501000006110 | Cerebral amyloidosis                                       |
| Amyloidosis      | 303845017        | Nephrotic syndrome in amyloidosis                          |
| Amyloidosis      | 293828012        | [X]Other amyloidosis                                       |
| Amyloidosis      | 2196531000000110 | Amyloidosis of stomach                                     |
| Amyloidosis      | 2211461000000110 | Amyloidosis of small intestine                             |
| Amyloidosis      | 5568041000006110 | AA amyloidosis   |
| Amyloidosis      | 356493018        | Senile systemic amyloidosis                                |
| Amyloidosis      | 293571011        | Amyloidosis NOS  |
| Amyloidosis      | 301718017        | Pulmonary amyloidosis                                      |
| Amyloidosis      | 418931015        | Secondary amyloidosis                                      |
| Amyloidosis      | 356485018        | Organ limited non-hereditary amyloidosis                   |
| Amyloidosis      | 421244010        | Cutaneous amyloidosis                                      |
| Amyloidosis      | 1780351000006110 | Participant in ALchemy (AL amyloidosis chemotherapy) study |
| Amyloidosis      | 480631000006119  | Amyloid heart muscle disease                               |
| Amyloidosis      | 2211471000000110 | Amyloid of small intestine                                 |
| Amyloidosis      | 2211441000000110 | Amyloid of intestine                                       |
| Amyloidosis      | 2196561000000110 | Amyloid of stomach   |
| Amyloidosis      | 2211531000000110 | Amyloid of large intestine                                 |
| Amyloidosis      | 356491016        | Arthropathy in amyloidosis                                 |
| Amyloidosis      | 485267014        | Beta-2 microglobulin amyloidosis                           |
| Amyloidosis      | 2211521000000110 | Amyloidosis of large intestine                             |
| Amyloidosis      | 356490015        | Amyloid arthropathy  |
| Amyloidosis      | 293836015        | [X]Hereditary amyloidosis, unspecified                     |
| Amyloidosis      | 28040018         | Cardiac amyloidosis  |



|                        |                  |   |
|------------------------|------------------|---|
| Amyloidosis            | 29745012         | Amyloidosis   |
| Amyloidosis            | 293560010        | Sporadic primary amyloidosis  |
| Amyloidosis            | 98079017         | Conjunctival amyloidosis  |
| Amyloidosis            | 1230634013       | Nephropathic amyloidosis  |
| Amyloidosis            | 356488016        | Articular amyloid   |
| Amyloidosis            | 821721000006117  | Heredofamilial amyloidosis, unspecified                             |
| Amyloidosis            | 297554011        | Polyneuropathy in amyloidosis                                       |
| Aphakia                | 40305018         | Aphakia   |
| Aphakia                | 5029381000006110 | Aphakic corneal oedema  |
| Aphakia                | 489131000006117  | Aphakia and other disorders of lens NOS                             |
| Aphakia                | 59043013         | Congenital aphakia  |
| Aphakia                | 489121000006115  | Aphakia and other disorders of lens                                 |
| Aphakia                | 2743971000006110 | Aphakic glaucoma  |
| Aphakia                | 283082012        | Spectacles for aphakia  |
| Carotid Artery Disease | 271534013        | Carotid endarterectomy  |
| Carotid Artery Disease | 271539015        | Ligation of carotid artery  |
| Carotid Artery Disease | 41282012         | Aneurysm of internal carotid artery                                 |
| Carotid Artery Disease | 271542014        | Operation on aneurysm of carotid artery                             |
| Carotid Artery Disease | 271538011        | Repair of carotid artery NEC  |
| Carotid Artery Disease | 482451000006111  | Aneurysm of common carotid art                                      |
| Carotid Artery Disease | 324816018        | Mechanical complication of carotid artery bypass                    |
| Carotid Artery Disease | 271540018        | Open embolectomy of carotid artery                                  |
| Carotid Artery Disease | 345684012        | Carotid territory transient ischaemic attack                        |
| Carotid Artery Disease | 1548281000006110 | Percutaneous transluminal insertion of stent into carotid artery    |
| Carotid Artery Disease | 5886761000006110 | Carotid artery atheroma   |
| Carotid Artery Disease | 3550511000006110 | Carotid artery narrowing  |
| Carotid Artery Disease | 271536010        | Reconstruction of carotid artery NOS                                |
| Carotid Artery Disease | 641561000006113  | Endarterectomy of carotid artery and patch repair of carotid artery |
| Carotid Artery Disease | 2695715012       | Endovascular repair of carotid artery                               |
| Carotid Artery Disease | 9843291000006120 | Left carotid artery dissection                                      |
| Carotid Artery Disease | 114794013        | Moyamoya disease  |
| Carotid Artery Disease | 271530016        | Intracranial bypass to carotid artery                               |

|                        |                  |  |
|------------------------|------------------|--|
| Carotid Artery Disease | 126531000006111  | Stenosis, carotid artery                                     |
| Carotid Artery Disease | 6350071000006110 | Carotid artery disease                                       |
| Carotid Artery Disease | 5058131000006110 | Internal carotid artery stenosis                             |
| Carotid Artery Disease | 7459331000006110 | Drug-eluting carotid artery stent                            |
| Carotid Artery Disease | 100771000006112  | Carotid artery thrombosis                                    |
| Carotid Artery Disease | 300244012        | Subarachnoid haemorrhage from carotid siphon and bifurcation |
| Carotid Artery Disease | 271531017        | Bypass of carotid artery                                     |
| Carotid Artery Disease | 262236010        | Carotid artery angiogram abnormal                            |
| Carotid Artery Disease | 375781000000110  | Intracranial bypass from carotid artery NEC                  |
| Carotid Artery Disease | 1746621000006110 | Carotid endarterectomy                                       |
| Carotid Artery Disease | 271546012        | Percutaneous transluminal angioplasty of carotid artery      |
| Carotid Artery Disease | 938561000006115  | Carotid atherosclerosis                                      |
| Carotid Artery Disease | 884471000006118  | Carotid artery occluded                                      |
| Carotid Artery Disease | 300344014        | Carotid artery syndrome hemispheric                          |
| Carotid Artery Disease | 3634871000006110 | Carotid artery obstruction                                   |
| Carotid Artery Disease | 5048771000006110 | Endarterectomy of internal carotid artery                    |
| Carotid Artery Disease | 2672991000006110 | Aneurysm of common carotid artery                            |
| Carotid Artery Disease | 271529014        | Replacement of carotid artery using graft                    |
| Carotid Artery Disease | 5058141000006110 | ICA - Internal carotid artery stenosis                       |
| Carotid Artery Disease | 271528018        | Reconstruction of carotid artery                             |
| Carotid Artery Disease | 7806281000006110 | Carotid artery dissection                                    |
| Carotid Artery Disease | 107332010        | Carotid artery stenosis                                      |
| Carotid Artery Disease | 345709014        | Dissection of internal carotid artery                        |
| Carotid Artery Disease | 271535014        | Other specified reconstruction of carotid artery             |
| Carotid Artery Disease | 1228941010       | Carotid artery disease                                       |
| Carotid Artery Disease | 395778016        | Carotid artery occlusion                                     |

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| Carotid Artery Disease | 101523017        | Aneurysm of external carotid artery                                     |
| Carotid Artery Disease | 5058511000006110 | Carotid artery aneurysm   |
| Carotid Artery Disease | 271533019        | Carotid endarterectomy and patch  |
| Cataract               | 298133011        | Unspecified secondary cataract  |
| Cataract               | 913901000006112  | Type 1 diabetes mellitus with diabetic cataract                         |
| Cataract               | 298097011        | Total, mature senile cataract   |
| Cataract               | 84501000006114   | Type 2 diabetes mellitus with diabetic cataract                         |
| Cataract               | 6049941000006110 | Mixed type cataract   |
| Cataract               | 451375018        | H/O: L cataract extraction  |
| Cataract               | 251654019        | H/O: cataract   |
| Cataract               | 9918017          | Posterior subcapsular polar senile cataract                             |
| Cataract               | 298126011        | Cataract due to other disorder  |
| Cataract               | 991741000006111  | Secondary cataract  |
| Cataract               | 912761000006117  | Phakoemulsification of lens and insertion of prosthetic replacement     |
| Cataract               | 126733015        | Cataract with neovascularisation  |
| Cataract               | 57632013         | Posterior subcapsular polar cataract                                    |
| Cataract               | 267088016        | Intracapsular extraction of cataract                                    |
| Cataract               | 57359011         | Traumatic cataract  |
| Cataract               | 107602013        | Myotonic cataract   |
| Cataract               | 298113012        | Cataract secondary to ocular disease                                    |
| Cataract               | 298145019        | Cataract NOS  |
| Cataract               | 313009012        | Capsular and subcapsular cataract                                       |
| Cataract               | 178759010        | Anterior subcapsular polar senile cataract                              |
| Cataract               | 853711000006111  | Left cataract extraction and implant                                    |
| Cataract               | 6041201000006110 | Phakoemulsification with intraocular lens implantation                  |
| Cataract               | 853641000006116  | Left cataract extraction  |
| Cataract               | 298092017        | Immature cataract   |
| Cataract               | 89579016         | Nuclear cataract  |
| Cataract               | 853291000006111  | Cataract extraction & lens repl   |
| Cataract               | 6438471000006110 | IOL - Cataract extraction and insertion of intraocular lens             |
| Cataract               | 6916251000006110 | Bimanual phacoemulsification of lens with intraocular lens implantation |
| Cataract               | 298090013        | Age-related cataract  |
| Cataract               | 36608018         | Cataract in degenerative disorder                                       |
| Cataract               | 298078011        | Infantile, juvenile and presenile cataracts                             |
| Cataract               | 299465011        | [X]Other specified cataract   |
| Cataract               | 1771661000006110 | Cataract extraction and insertion of intraocular lens                   |
| Cataract               | 313014011        | Zonular cataract  |
| Cataract               | 298083015        | Cortical cataract   |
| Cataract               | 84871000006117   | Cataract due to diabetes mellitus type 2                                |
| Cataract               | 298131013        | Cataract due to other physical inflammation                             |
| Cataract               | 158573017        | Subcapsular cataract  |
| Cataract               | 914301000006111  | Type 2 diabetes mellitus with diabetic cataract                         |
| Cataract               | 313011015        | Capsular and/or subcapsular cataract                                    |

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| Cataract | 298088012        | Nonsenile cataract NOS   |
| Cataract | 399449014        | Hypermaturation cataract   |
| Cataract | 6220551000006110 | Extraction of cataract by ultrasonic phacofragmentation                          |
| Cataract | 451374019        | H/O: R cataract extraction   |
| Cataract | 6041211000006110 | Phacoemulsification with intraocular lens implantation                           |
| Cataract | 6041181000006110 | Small incision phacoemulsification of cataract and insertion of intraocular lens |
| Cataract | 859771000006116  | Cataract extraction unsp.  |
| Cataract | 298087019        | Other nonsenile cataract   |
| Cataract | 505939016        | Phacoemulsification of lens  |
| Cataract | 21000016         | Coronary cataract  |
| Cataract | 298132018        | Cataract due to other disorder NOS   |
| Cataract | 3766951000006110 | Brunescent cataract  |
| Cataract | 298080017        | Unspecified juvenile cataract  |
| Cataract | 299468013        | [X]Cataract in other diseases classified elsewhere                               |
| Cataract | 3868931000006110 | Phacoemulsification  |
| Cataract | 574651000006115  | Combined form of senile cataract   |
| Cataract | 298081018        | Unspecified presenile cataract   |
| Cataract | 473371000006112  | After cataract   |
| Cataract | 3390661000006110 | Cataract extraction  |
| Cataract | 505940019        | Phacoemulsification of lens  |
| Cataract | 298091012        | Incipient cataract   |
| Cataract | 298111014        | Partial resolved traumatic cataract  |
| Cataract | 495988011        | Needling of lens for cataract  |
| Cataract | 158572010        | Bilateral cataracts  |
| Cataract | 298130014        | Toxic cataract not due to drugs  |
| Cataract | 928811000006119  | Cataract extract + lens implant  |
| Cataract | 298103016        | Senile cataract NOS  |
| Cataract | 989061000006112  | Secondary cataract   |
| Cataract | 298137012        | After cataract NOS   |
| Cataract | 771341000006114  | Insulin dependent diabetes mellitus with diabetic cataract                       |
| Cataract | 298144015        | Other cataract NOS   |
| Cataract | 298117013        | Cataract in eye inflammatory disorder  |
| Cataract | 298125010        | Cataract secondary to ocular disorder NOS  |
| Cataract | 281161000006114  | Non-insulin depend diabetes mellitus with diabetic cataract                      |
| Cataract | 630441000006118  | Drug induced cataract  |
| Cataract | 313012010        | Cortical and zonular cataract  |
| Cataract | 6057261000006110 | Posterior subcapsular cataract   |
| Cataract | 913891000006113  | Insulin dependent diabetes mellitus with diabetic cataract                       |
| Cataract | 73294018         | Diabetic cataract  |
| Cataract | 298104010        | Unspecified traumatic cataract   |
| Cataract | 298128012        | Cataract associated with other syndromes   |
| Cataract | 853701000006113  | Right cataract extraction and implant  |
| Cataract | 451393017        | O/E - Right cataract present   |
| Cataract | 859791000006115  | Cataract extract +lens implant   |

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| Cataract | 84321000006114   | Type 1 diabetes mellitus with diabetic cataract                     |
| Cataract | 3868891000006110 | Aspiration of cataract by phacoemulsification                       |
| Cataract | 130863017        | Cortical senile cataract  |
| Cataract | 313010019        | Capsular cataract   |
| Cataract | 6651291000006110 | Phacoemulsification with intraocular lens implantation              |
| Cataract | 298112019        | Traumatic cataract NOS  |
| Cataract | 253774010        | O/E - cataract present  |
| Cataract | 853651000006119  | Right cataract extraction   |
| Cataract | 495989015        | Discission of cataract  |
| Cataract | 2124371000000110 | Bullous aphakic keratopathy following cataract surgery              |
| Cataract | 451394011        | O/E - Left cataract present   |
| Cataract | 4772541000006110 | Cataracta complicata  |
| Cataract | 313017016        | Cortical or zonular cataract NOS                                    |
| Cataract | 907861000006114  | [RFC] Cataract  |
| Cataract | 912751000006119  | Phacoemulsification of lens and insertion of prosthetic replacement |
| Cataract | 4772531000006110 | Complicated cataract  |
| Cataract | 1489323012       | H/O: Bilateral cataract extraction                                  |
| Cataract | 2718741000006110 | Extracapsular cataract extraction                                   |
| Cataract | 3390651000006110 | Excision of cataract  |
| Cataract | 298086011        | Combined nonsenile cataract   |
| Cataract | 298135016        | After-cataract with vision obscured                                 |
| Cataract | 6651261000006110 | Phacoemulsification of lens and insertion of intraocular lens       |
| Cataract | 1479675015       | Cataract extraction and insertion of intraocular lens               |
| Cataract | 298142016        | Other cataract  |
| Cataract | 883311000006115  | Secondary cataract  |
| Cataract | 298116016        | Unspecified cataracta complicata                                    |
| Cataract | 15277015         | Total traumatic cataract  |
| Cataract | 4061501000006110 | Cataracts   |
| Cataract | 4407071000006110 | Cataract  |
| Cataract | 659551000006113  | Extracapsular extraction of cataract                                |
| Cataract | 298102014        | Other senile cataract   |
| Cataract | 2124391000000110 | Keratopathy following cataract surgery                              |
| Cataract | 298079015        | Unspecified infantile cataract                                      |
| Cataract | 298880018        | Vitreous syndrome following cataract surgery                        |
| Cataract | 455415018        | Immature cortical cataract  |
| Cataract | 2674521000006110 | Calcified cataract  |
| Cataract | 410918012        | Extraction of cataract  |
| Cataract | 539421000006110  | Cataract finding  |
| Cataract | 299464010        | [X]Other senile cataract  |
| Cataract | 567741000000116  | Operation on cataract planned                                       |
| Cataract | 2512031000006110 | Mature cataract   |
| Cataract | 3868901000006110 | Extraction of cataract by emulsification and aspiration             |
| Cataract | 217851000006114  | After-cataract  |
| Cataract | 84691000006115   | Cataract due to diabetes mellitus type 1                            |
| Cataract | 370441000006113  | [X]Cataract/oth endocrine,nutritional+metabolic diseases CE         |

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| Cataract                | 6919391000006110  | On examination - cataract of left eye                                      |
| Cataract                | 3463017           | Anterior subcapsular polar cataract  |
| Cataract                | 6206141000006110  | Nuclear sclerotic cataract   |
| Cataract                | 1227680019        | [V]State following cataract extraction                                     |
| Cataract                | 699721000006118   | Morgagni cataract  |
| Cataract                | 113312017         | Tetanic cataract   |
| Cataract                | 189671000006110   | Radiation induced cataract   |
| Cataract                | 2159947017        | Referral for cataract extraction   |
| Cataract                | 6588781000006110  | Complicated cataract surgery   |
| Cataract                | 298076010         | Cataract   |
| Cataract                | 67912012          | Punctate cataract  |
| Cataract                | 298134017         | Other after cataract with vision normal                                    |
| Cataract                | 4180211000006110  | Cataract surgery   |
| Cataract                | 12048771000000000 | Secondary cataract   |
| Cataract                | 6923281000006110  | On examination - cataract of right eye                                     |
| Cataract                | 913911000006110   | Type I diabetes mellitus with diabetic cataract                            |
| Cataract                | 6988341000006110  | Cataract surgery   |
| Cataract                | 914311000006114   | Type II diabetes mellitus with diabetic cataract                           |
| Cataract                | 66160017          | Senile cataract  |
| Cataract                | 6702541000006110  | Steroid induced cataract   |
| Cataract                | 5980961000006110  | Intracapsular cataract extraction and insertion of intraocular lens        |
| Cataract                | 298096019         | Nuclear senile cataract  |
| Cataract                | 6869861000006110  | Phacoemulsification of cataract with intraocular lens implantation         |
| Cerebrovascular Disease | 125470015         | Cerebral embolism  |
| Cerebrovascular Disease | 5010981000006110  | Stroke   |
| Cerebrovascular Disease | 299342019         | Lacunar infarction   |
| Cerebrovascular Disease | 300939013         | Cerebral haemorrhage   |
| Cerebrovascular Disease | 118689010         | Cerebral thrombosis  |
| Cerebrovascular Disease | 398571000006112   | Mixed cortical and subcortical vascular dementia                           |
| Cerebrovascular Disease | 1972541000006110  | Vascular dementia of acute onset, other symptoms, predominantly depressive |
| Cerebrovascular Disease | 1780256012        | Tortuous carotid artery  |
| Cerebrovascular Disease | 300294013         | Subdural haemorrhage - nontraumatic  |
| Cerebrovascular Disease | 92070010          | Cerebral atherosclerosis   |
| Cerebrovascular Disease | 300363010         | Anterior cerebral artery syndrome  |
| Cerebrovascular Disease | 2534196010        | Stroke/transient ischaemic attack monitoring third letter                  |
| Cerebrovascular Disease | 809431000006118   | H/O: CVS disease NOS   |

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| Cerebrovascular Disease | 884511000006111  | Transient Ischaemic Attacks  |
| Cerebrovascular Disease | 1972481000006110 | Vascular dementia of acute onset, without additional symptoms                              |
| Cerebrovascular Disease | 1972791000006110 | Subcortical vascular dementia, other mixed symptoms  |
| Cerebrovascular Disease | 1972821000006110 | Mixed cortical and subcortical vascular dementia, without additional symptoms              |
| Cerebrovascular Disease | 417171000006111  | [X]Other vascular syndroms/brain in cerebrovasculr diseases                                |
| Cerebrovascular Disease | 300935019        | [X]Subarachnoid haemorrhage from other intracranial arteries                               |
| Cerebrovascular Disease | 841051000006113  | Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy |
| Cerebrovascular Disease | 271590019        | Embolisation of cerebral artery NEC  |
| Cerebrovascular Disease | 264499015        | Stroke monitoring  |
| Cerebrovascular Disease | 271527011        | Carotid, cerebral and subclavian artery operations   |
| Cerebrovascular Disease | 300349016        | Transient cerebral ischaemia NOS   |
| Cerebrovascular Disease | 1972501000006110 | Vascular dementia of acute onset, other symptoms, predominantly delusional                 |
| Cerebrovascular Disease | 411518010        | H/O: CVA   |
| Cerebrovascular Disease | 2469365010       | Stroke / transient ischaemic attack referral   |
| Cerebrovascular Disease | 1667741000000110 | [V]Personal history of transient ischaemic attack  |
| Cerebrovascular Disease | 884441000006114  | Subdural haemorrhage   |
| Cerebrovascular Disease | 884541000006110  | Cerebral arteriosclerosis  |
| Cerebrovascular Disease | 1972831000006110 | Mixed cortical and subcortical vascular dementia, other symptoms, predominantly delusional |
| Cerebrovascular Disease | 300309012        | Vertebral artery occlusion   |
| Cerebrovascular Disease | 313568013        | Cerebrovascular system anomalies   |
| Cerebrovascular Disease | 2534253014       | Stroke/transient ischaemic attack monitoring first letter                                  |
| Cerebrovascular Disease | 300370010        | Left sided CVA   |
| Cerebrovascular Disease | 123481000006118  | Subarachnoid haemorrhage from anterior communicating artery                                |
| Cerebrovascular Disease | 481028017        | Subarachnoid haemorrhage   |
| Cerebrovascular Disease | 7840631000006110 | Ischaemic vascular dementia  |
| Cerebrovascular Disease | 1972711000006110 | Subcortical vascular dementia, without additional symptoms                                 |

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| Cerebrovascular Disease | 300389010        | Nonruptured cerebral aneurysm due to dissection of cerebral artery       |
| Cerebrovascular Disease | 1973381000006110 | Other vascular dementia, other symptoms, predominantly depressive        |
| Cerebrovascular Disease | 300941014        | [X]Other cerebral infarction   |
| Cerebrovascular Disease | 300257016        | Subarachnoid haemorrhage NOS   |
| Cerebrovascular Disease | 1973341000006110 | Other vascular dementia, other symptoms, predominantly hallucinatory     |
| Cerebrovascular Disease | 300344014        | Carotid artery syndrome hemispheric                                      |
| Cerebrovascular Disease | 2127781000000110 | Stroke initial post discharge review                                     |
| Cerebrovascular Disease | 345650013        | Brainstem infarction NOS   |
| Cerebrovascular Disease | 1973551000006110 | Vascular dementia, unspecified, other symptoms, predominantly depressive |
| Cerebrovascular Disease | 397829016        | H/O: cardiovascular disease  |
| Cerebrovascular Disease | 300322016        | Cerebral infarction due to embolism of cerebral arteries                 |
| Cerebrovascular Disease | 405339016        | Cerebrovascular accident   |
| Cerebrovascular Disease | 3414251000006110 | VAD - Vascular dementia  |
| Cerebrovascular Disease | 2397671000000110 | Qbleed 5 year risk of intracranial haemorrhage                           |
| Cerebrovascular Disease | 1573101000006110 | Cerebral infarction with haemorrhagic transformation                     |
| Cerebrovascular Disease | 294711012        | Subacute confusional state, of cerebrovascular origin                    |
| Cerebrovascular Disease | 4056981000006110 | Cerebral venous thrombosis   |
| Cerebrovascular Disease | 123491000006115  | Subarachnoid haemorrhage from basilar artery                             |
| Cerebrovascular Disease | 497559016        | Arteriosclerotic dementia  |
| Cerebrovascular Disease | 1973401000006110 | Other vascular dementia, other mixed symptoms                            |
| Cerebrovascular Disease | 451371010        | H/O: Stroke in last year   |
| Cerebrovascular Disease | 75861010         | Cerebrovascular amyloidosis  |
| Cerebrovascular Disease | 451133011        | Left sided cerebral infarction   |
| Cerebrovascular Disease | 300418010        | Other specified cerebrovascular disease                                  |
| Cerebrovascular Disease | 908801000006114  | [RFC] Stroke   |
| Cerebrovascular Disease | 345710016        | Vertebral artery dissection  |



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| Cerebrovascular Disease | 451134017        | Right sided cerebral infarction                                     |
| Cerebrovascular Disease | 746571000006116  | Intracerebral haemorrhage, multiple localized                       |
| Cerebrovascular Disease | 67501000006115   | Vertebrobasilar artery syndrome                                     |
| Cerebrovascular Disease | 4778181000006110 | Left sided cerebral hemisphere cerebrovascular accident             |
| Cerebrovascular Disease | 1160471000000110 | Stroke 6 month review   |
| Cerebrovascular Disease | 428201000006119  | Subcortical vascular dementia                                       |
| Cerebrovascular Disease | 1130181000000110 | Small vessel cerebrovascular disease                                |
| Cerebrovascular Disease | 100771000006112  | Carotid artery thrombosis   |
| Cerebrovascular Disease | 2534198011       | Subdural haemorrhage  |
| Cerebrovascular Disease | 1227591017       | [V]Personal history of stroke                                       |
| Cerebrovascular Disease | 498516011        | Evacuation of intracranial subdural haematoma                       |
| Cerebrovascular Disease | 300362017        | Middle cerebral artery syndrome                                     |
| Cerebrovascular Disease | 506344012        | Clipping of aneurysm of cerebral artery                             |
| Cerebrovascular Disease | 1212072018       | Occlusive stroke  |
| Cerebrovascular Disease | 884451000006111  | Cerebral haemorrhage NOS  |
| Cerebrovascular Disease | 605461000006117  | CVA - cerebrovascular accident due to cerebral artery occlusion     |
| Cerebrovascular Disease | 542251000006112  | Cerebral infarction due to cerebral venous thrombosis, non-pyogenic |
| Cerebrovascular Disease | 542831000006116  | Cerebral embolus  |
| Cerebrovascular Disease | 542511000006113  | Cerebral artery aneurysm operations                                 |
| Cerebrovascular Disease | 90011000006112   | Transluminal operations on cerebral artery or circle of Willis      |
| Cerebrovascular Disease | 345658018        | Pure sensory lacunar syndrome                                       |
| Cerebrovascular Disease | 300287010        | Intracerebral haemorrhage NOS                                       |
| Cerebrovascular Disease | 451368019        | H/O: cerebrovascular disease  |
| Cerebrovascular Disease | 363791000006112  | [X]Arteriosclerotic dementia  |
| Cerebrovascular Disease | 503469016        | Pontine haemorrhage   |
| Cerebrovascular Disease | 2126181000000110 | Stroke annual review  |

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| Cerebrovascular Disease | 58046010          | Vertebral artery syndrome  |
| Cerebrovascular Disease | 543141000006110   | Cerebrl infarctn due/unspcf occlusn or sten/cerebrl artrts                                 |
| Cerebrovascular Disease | 907591000006116   | [RFC] Stroke   |
| Cerebrovascular Disease | 300321011         | Cerebral infarction due to thrombosis of cerebral arteries                                 |
| Cerebrovascular Disease | 350804018         | Congenital cerebral arteriovenous malformation   |
| Cerebrovascular Disease | 271534013         | Carotid endarterectomy   |
| Cerebrovascular Disease | 416991000006112   | Transient cerebral ischemia  |
| Cerebrovascular Disease | 748941000006115   | Left sided intracerebral haemorrhage, unspecified  |
| Cerebrovascular Disease | 100691000006118   | Cerebral venous thrombosis of cavernous sinus  |
| Cerebrovascular Disease | 345709014         | Dissection of internal carotid artery  |
| Cerebrovascular Disease | 122361000006113   | Stroke due to cerebral arterial occlusion  |
| Cerebrovascular Disease | 2475119012        | Non-traumatic subdural haemorrhage   |
| Cerebrovascular Disease | 395788015         | Transient cerebral ischaemia   |
| Cerebrovascular Disease | 300364016         | Posterior cerebral artery syndrome   |
| Cerebrovascular Disease | 696161000006115   | Multi-infarct dementia   |
| Cerebrovascular Disease | 1972911000006110  | Mixed cortical and subcortical vascular dementia, other symptoms, predominantly depressive |
| Cerebrovascular Disease | 1227592012        | [V]Personal history of cerebrovascular accident (CVA)                                      |
| Cerebrovascular Disease | 2476091017        | H/O: stroke  |
| Cerebrovascular Disease | 271542014         | Operation on aneurysm of carotid artery  |
| Cerebrovascular Disease | 294652012         | Uncomplicated arteriosclerotic dementia  |
| Cerebrovascular Disease | 11920121000000000 | Transient cerebral ischemia  |
| Cerebrovascular Disease | 1972521000006110  | Vascular dementia of acute onset, other symptoms, predominantly hallucinatory              |
| Cerebrovascular Disease | 2548554013        | Haemorrhagic stroke monitoring   |
| Cerebrovascular Disease | 431691000006119   | Vascular dementia of acute onset   |
| Cerebrovascular Disease | 884531000006117   | Stroke   |
| Cerebrovascular Disease | 345655015         | Pure motor lacunar syndrome  |

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| Cerebrovascular Disease | 345684012        | Carotid territory transient ischaemic attack                           |
| Cerebrovascular Disease | 884521000006115  | Stroke/CVA - undefined   |
| Cerebrovascular Disease | 300298011        | Intracranial haemorrhage   |
| Cerebrovascular Disease | 1973461000006110 | Vascular dementia, unspecified, without additional symptoms            |
| Cerebrovascular Disease | 300379011        | Generalised ischaemic cerebrovascular disease NOS                      |
| Cerebrovascular Disease | 300401011        | Other cerebrovascular disease OS                                       |
| Cerebrovascular Disease | 122401000006115  | Stroke unspecified   |
| Cerebrovascular Disease | 106392017        | Basilar artery syndrome  |
| Cerebrovascular Disease | 371641000000112  | Delivery of rehabilitation for stroke                                  |
| Cerebrovascular Disease | 907581000006119  | [RFC] Stroke/CVA   |
| Cerebrovascular Disease | 300936018        | [X]Other subarachnoid haemorrhage                                      |
| Cerebrovascular Disease | 1972931000006110 | Mixed cortical and subcortical vascular dementia, other mixed symptoms |
| Cerebrovascular Disease | 402206010        | Cerebral haemorrhage unspecified, due to birth trauma                  |
| Cerebrovascular Disease | 605491000006113  | CVA - Cerebrovascular accident   |
| Cerebrovascular Disease | 744921000006116  | Intracerebral haemorrhage in hemisphere, unspecified                   |
| Cerebrovascular Disease | 395780010        | Cerebral infarction  |
| Cerebrovascular Disease | 1548281000006110 | Percutaneous transluminal insertion of stent into carotid artery       |
| Cerebrovascular Disease | 538651000006114  | Imaging of carotid arteries  |
| Cerebrovascular Disease | 300366019        | Cerebellar stroke syndrome   |
| Cerebrovascular Disease | 1973221000006110 | Other vascular dementia, without additional symptoms                   |
| Cerebrovascular Disease | 104563015        | Cerebrovascular disease  |
| Cerebrovascular Disease | 940071000006116  | Stroke monitoring invite 2   |
| Cerebrovascular Disease | 800691000006113  | Diffuse cerebrovascular disease  |
| Cerebrovascular Disease | 966981000006112  | Referral to multidisciplinary stroke function improvement service      |
| Cerebrovascular Disease | 865981000006114  | Clipping - aneurysm  |
| Cerebrovascular Disease | 2118011000000110 | Stroke self-management plan agreed                                     |

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| Cerebrovascular Disease | 1973531000006110 | Vascular dementia, unspecified, other symptoms, predominantly hallucinatory |
| Cerebrovascular Disease | 41282012         | Aneurysm of internal carotid artery   |
| Cerebrovascular Disease | 300402016        | Other cerebrovascular disease NOS   |
| Cerebrovascular Disease | 940081000006118  | Stroke monitoring invite 3  |
| Cerebrovascular Disease | 300200014        | Cardiovascular arteriosclerosis unspecified                                 |
| Cerebrovascular Disease | 271533019        | Carotid endarterectomy and patch  |
| Cerebrovascular Disease | 123511000006114  | Subarachnoid haemorrhage from middle cerebral artery                        |
| Cerebrovascular Disease | 300419019        | Cerebrovascular disease NOS   |
| Cerebrovascular Disease | 107332010        | Carotid artery stenosis   |
| Cerebrovascular Disease | 1976831000006110 | Vascular dementia, unspecified, other mixed symptoms                        |
| Cerebrovascular Disease | 395778016        | Carotid artery occlusion  |
| Cerebrovascular Disease | 5492171000006110 | TIA   |
| Cerebrovascular Disease | 345675012        | Lobar cerebral haemorrhage  |
| Cerebrovascular Disease | 2115821000000110 | Stroke self-management plan review  |
| Cerebrovascular Disease | 123521000006118  | Subarachnoid haemorrhage from posterior communicating artery                |
| Cerebrovascular Disease | 431681000006117  | Vascular dementia   |
| Cerebrovascular Disease | 321061000006111  | [SO]Cerebral artery   |
| Cerebrovascular Disease | 1476248016       | Percutaneous coil embolisation of cerebral artery aneurysm                  |
| Cerebrovascular Disease | 236331000000111  | Stroke/transient ischaemic attack monitoring administration                 |
| Cerebrovascular Disease | 5960821000006110 | Referral to stroke service  |
| Cerebrovascular Disease | 271546012        | Percutaneous transluminal angioplasty of carotid artery                     |
| Cerebrovascular Disease | 300348012        | Other transient cerebral ischaemia  |
| Cerebrovascular Disease | 300303013        | Basilar artery occlusion  |
| Cerebrovascular Disease | 449935012        | Admission to stroke unit  |
| Cerebrovascular Disease | 641561000006113  | Endarterectomy of carotid artery and patch repair of carotid artery         |
| Cerebrovascular Disease | 122371000006118  | Cerebral haemorrhage  |

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| Cerebrovascular Disease | 499739014        | Insufficiency - basilar artery  |
| Cerebrovascular Disease | 300290016        | Other and unspecified intracranial haemorrhage  |
| Cerebrovascular Disease | 1973501000006110 | Vascular dementia, unspecified, other symptoms, predominantly delusional                      |
| Cerebrovascular Disease | 1973271000006110 | Other vascular dementia, other symptoms, predominantly delusional                             |
| Cerebrovascular Disease | 1972731000006110 | Subcortical vascular dementia, other symptoms, predominantly delusional                       |
| Cerebrovascular Disease | 524511000006116  | Brainstem stroke syndrome   |
| Cerebrovascular Disease | 884421000006119  | Cerebral haemorrhage  |
| Cerebrovascular Disease | 295680015        | [X]Other vascular dementia  |
| Cerebrovascular Disease | 605471000006112  | Cerebral hemorrhage   |
| Cerebrovascular Disease | 1972871000006110 | Mixed cortical and subcortical vascular dementia, other symptoms, predominantly hallucinatory |
| Cerebrovascular Disease | 300411016        | Sequelae of cerebral infarction   |
| Cerebrovascular Disease | 265692011        | Evacuation of intracerebral haematoma   |
| Cerebrovascular Disease | 1148331000000110 | Transient ischaemic attack clinical management plan   |
| Cerebrovascular Disease | 294703019        | Acute confusional state, of cerebrovascular origin  |
| Cerebrovascular Disease | 1972751000006110 | Subcortical vascular dementia, other symptoms, predominantly hallucinatory                    |
| Cerebrovascular Disease | 218511000000117  | Infarction - cerebral   |
| Cerebrovascular Disease | 5011741000006110 | Dissection of vertebral artery  |
| Cerebrovascular Disease | 126531000006111  | Stenosis, carotid artery  |
| Cerebrovascular Disease | 605501000006117  | CVA unspecified   |
| Cerebrovascular Disease | 7519441000006110 | Cerebrovascular accident annual review  |
| Cerebrovascular Disease | 1222398015       | Cerebral arterial occlusion   |
| Cerebrovascular Disease | 297013012        | Cerebral degeneration due to cerebrovascular disease  |
| Cerebrovascular Disease | 300374018        | Other cerebrovascular disease   |
| Cerebrovascular Disease | 399031000006111  | [X]Multi-infarct dementia   |
| Cerebrovascular Disease | 938561000006115  | Carotid atherosclerosis   |
| Cerebrovascular Disease | 1228941010       | Carotid artery disease  |

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| Cerebrovascular Disease | 106394016        | Vertebrobasilar insufficiency   |
| Cerebrovascular Disease | 491461000006118  | Arteriography of cerebral artery  |
| Cerebrovascular Disease | 300313017        | Cerebral infarction due to embolism of precerebral arteries             |
| Cerebrovascular Disease | 47484015         | Cerebral arteritis  |
| Cerebrovascular Disease | 2436731000000110 | Old cerebral infarction on imaging                                      |
| Cerebrovascular Disease | 163261000006119  | Right sided intracerebral haemorrhage, unspecified                      |
| Cerebrovascular Disease | 809421000006116  | History of cerebrovascular accident                                     |
| Cerebrovascular Disease | 2534212018       | Stroke/transient ischaemic attack monitoring second letter              |
| Cerebrovascular Disease | 395783012        | Transient ischaemic attack  |
| Cerebrovascular Disease | 1972771000006110 | Subcortical vascular dementia, other symptoms, predominantly depressive |
| Cerebrovascular Disease | 271529014        | Replacement of carotid artery using graft                               |
| Cerebrovascular Disease | 884471000006118  | Carotid artery occluded   |
| Cerebrovascular Disease | 1235913017       | Cerebral vein thrombosis  |
| Cerebrovascular Disease | 914921000006117  | [D] Vascular dementia   |
| Cerebrovascular Disease | 300277011        | Intracerebral haemorrhage, intraventricular                             |
| Cerebrovascular Disease | 295681016        | [X]Vascular dementia, unspecified                                       |
| Cerebrovascular Disease | 67511000006117   | Vertebro-basilar insufficiency  |
| Cerebrovascular Disease | 744901000006114  | Intracerebral haemorrhage (ICH)   |
| Cerebrovascular Disease | 158118014        | Cerebellar infarction   |
| Cerebrovascular Disease | 1994761000006110 | Referral to stroke rehabilitation service                               |
| Cerebrovascular Disease | 95931000006111   | Transient cerebral ischaemia NOS  |
| Cerebrovascular Disease | 2008601000006110 | Discharge from community stroke service                                 |
| Cerebrovascular Disease | 100721000006111  | Cerebral venous sinus thrombosis  |
| Cerebrovascular Disease | 300312010        | Cerebral infarct due to thrombosis of precerebral arteries              |
| Cerebrovascular Disease | 2476647018       | Vertebral artery compression syndrome                                   |
| Cerebrovascular Disease | 502878012        | Cerebellar haemorrhage  |

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| Cerebrovascular Disease | 1972571000006110 | Vascular dementia of acute onset, other mixed symptoms          |
| Charcot-Marie-Tooth     | 297522019        | Peroneal muscular atrophy NOS                                   |
| Charcot-Marie-Tooth     | 1846861000006110 | Charcot-Marie-Tooth syndrome                                    |
| Charcot-Marie-Tooth     | 1777664015       | Hereditary motor and sensory neuropathy                         |
| Charcot-Marie-Tooth     | 84201015         | CMT - Charcot-Marie-Tooth disease                               |
| Charcot-Marie-Tooth     | 545421000006111  | Charcot's atrophy   |
| Charcot-Marie-Tooth     | 187824013        | Dejerine-Sottas disease   |
| Charcot-Marie-Tooth     | 84200019         | Peroneal muscular atrophy                                       |
| Charcot-Marie-Tooth     | 1219655013       | Hereditary motor and sensory neuropathy type III                |
| Chronic Liver Disease   | 3206901000006110 | Multilobar cirrhosis  |
| Chronic Liver Disease   | 2816681000006110 | CL - Cirrhosis of liver   |
| Chronic Liver Disease   | 2781071000006110 | Esophageal varices with bleeding                                |
| Chronic Liver Disease   | 303465017        | Chronic liver disease   |
| Chronic Liver Disease   | 288171017        | Hepatic coma due to viral hepatitis                             |
| Chronic Liver Disease   | 2753761000006110 | Mixed micro AND macronodular cirrhosis                          |
| Chronic Liver Disease   | 268819017        | Open injection sclerotherapy to oesophageal varices             |
| Chronic Liver Disease   | 353613017        | Cirrhosis of liver  |
| Chronic Liver Disease   | 4656791000006110 | Fiberoptic endoscopic banding of esophageal varices             |
| Chronic Liver Disease   | 453265010        | Oesophageal varices in alcoholic cirrhosis of the liver         |
| Chronic Liver Disease   | 55851000006118   | Xanthomatous portal cirrhosis                                   |
| Chronic Liver Disease   | 286868015        | Viral hepatitis C with coma                                     |
| Chronic Liver Disease   | 1222437010       | Alper's disease   |
| Chronic Liver Disease   | 4787151000006110 | CAH - Chronic aggressive hepatitis                              |
| Chronic Liver Disease   | 5077141000006110 | Balloon tamponade of oesophagus using Sengstaken-Blakemore tube |
| Chronic Liver Disease   | 906081000006114  | [RFC] Cirrhosis   |
| Chronic Liver Disease   | 538081000000115  | Compensation for liver failure                                  |

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| Chronic Liver Disease | 314034017        | Atresia of hepatic ducts  |
| Chronic Liver Disease | 5077161000006110 | Sengstaken intubation of esophagus                                  |
| Chronic Liver Disease | 352566017        | Sengstaken intubation of oesophagus                                 |
| Chronic Liver Disease | 303517016        | Toxic liver disease with chronic active hepatitis                   |
| Chronic Liver Disease | 4656461000006110 | Open operations on esophageal varices                               |
| Chronic Liver Disease | 6941931000006110 | Laennec's cirrhosis   |
| Chronic Liver Disease | 300776018        | Oesophageal varices with bleeding in diseases EC                    |
| Chronic Liver Disease | 3011321000006110 | Watson-Alagille syndrome  |
| Chronic Liver Disease | 353625019        | Hepatic sclerosis   |
| Chronic Liver Disease | 4779721000006110 | Oesophageal varices with bleeding, associated with another disorder |
| Chronic Liver Disease | 17930015         | Chronic viral hepatitis   |
| Chronic Liver Disease | 3796401000006110 | Fatty metamorphosis of liver  |
| Chronic Liver Disease | 538101000000114  | Liver failure support management                                    |
| Chronic Liver Disease | 5524681000006110 | Cirrhosis secondary to cholestasis                                  |
| Chronic Liver Disease | 2824431000006110 | Progressive neuronal degeneration with liver cirrhosis              |
| Chronic Liver Disease | 451124014        | Chronic alcoholic hepatitis   |
| Chronic Liver Disease | 303781011        | [X]Other and unspecified cirrhosis of liver                         |
| Chronic Liver Disease | 303393017        | Cirrhosis and chronic liver disease                                 |
| Chronic Liver Disease | 48003016         | Oesophageal varices   |
| Chronic Liver Disease | 303452014        | Biliary cirrhosis of children                                       |
| Chronic Liver Disease | 2781011000006110 | Bleeding oesophageal varices  |
| Chronic Liver Disease | 52980015         | Primary biliary cirrhosis   |
| Chronic Liver Disease | 128627011        | Biliary atresia   |
| Chronic Liver Disease | 2576980018       | Portal cirrhosis  |
| Chronic Liver Disease | 286869011        | Other specified viral hepatitis with hepatic coma NOS               |
| Chronic Liver Disease | 396390012        | Multilobular portal cirrhosis                                       |



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| Chronic Liver Disease | 303425016        | Capsular portal cirrhosis  |
| Chronic Liver Disease | 4661761000006110 | Orthotopic transplantation of liver  |
| Chronic Liver Disease | 4657151000006110 | Rigid esophagoscopy and injection sclerotherapy of varices                         |
| Chronic Liver Disease | 303456012        | Chronic nonalcoholic liver disease   |
| Chronic Liver Disease | 4787861000006110 | PSC - Primary sclerosing cholangitis   |
| Chronic Liver Disease | 822591000006117  | Heterotopic liver transplant   |
| Chronic Liver Disease | 314033011        | Agenesis of hepatic ducts  |
| Chronic Liver Disease | 288170016        | [X]Chronic viral hepatitis, unspecified  |
| Chronic Liver Disease | 303420014        | Fatty portal cirrhosis   |
| Chronic Liver Disease | 1850901000006110 | Reason for influenza vaccine - chronic liver disease                               |
| Chronic Liver Disease | 2725291000006110 | Esophageal varices without bleeding  |
| Chronic Liver Disease | 324976011        | Liver transplant failure and rejection   |
| Chronic Liver Disease | 4657401000006110 | Balloon tamponade of oesophageal varices   |
| Chronic Liver Disease | 4657131000006110 | Rigid oesophagoscopy and injection sclerotherapy of varices                        |
| Chronic Liver Disease | 303466016        | Liver abscess and sequelae of chronic liver disease                                |
| Chronic Liver Disease | 303515012        | Toxic liver disease with chronic persistent hepatitis                              |
| Chronic Liver Disease | 303435010        | Toxic portal cirrhosis   |
| Chronic Liver Disease | 303516013        | Toxic liver disease with chronic lobular hepatitis                                 |
| Chronic Liver Disease | 820381000006112  | Hepatic fibrosis   |
| Chronic Liver Disease | 5086651000006110 | Chronic viral hepatitis B with hepatitis D   |
| Chronic Liver Disease | 211821000006111  | Postnecrotic cirrhosis of liver  |
| Chronic Liver Disease | 396391011        | Cardiac portal cirrhosis   |
| Chronic Liver Disease | 303458013        | Portal fibrosis without cirrhosis  |
| Chronic Liver Disease | 286876018        | Unspecified viral hepatitis with coma  |
| Chronic Liver Disease | 7065101000006110 | Fiberoptic endoscopic rubber band ligation of upper gastrointestinal tract varices |
| Chronic Liver Disease | 3607721000006110 | Congenital short bile duct   |

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| Chronic Liver Disease | 303419015        | Diffuse nodular cirrhosis                                       |
| Chronic Liver Disease | 303409014        | Chronic hepatitis unspecified                                   |
| Chronic Liver Disease | 267161000006118  | Oesophageal tamponade   |
| Chronic Liver Disease | 3059491000006110 | PHT - Portal hypertension                                       |
| Chronic Liver Disease | 4779691000006110 | Oesophageal varices associated with another disorder            |
| Chronic Liver Disease | 303518014        | Toxic liver disease with fibrosis and cirrhosis of liver        |
| Chronic Liver Disease | 1232261014       | Chronic viral hepatitis B                                       |
| Chronic Liver Disease | 4656761000006110 | Fiberoptic esophagoscopy and injection sclerotherapy of varices |
| Chronic Liver Disease | 4657381000006110 | Balloon tamponade of oesophagus                                 |
| Chronic Liver Disease | 4787221000006110 | Pipestem portal cirrhosis                                       |
| Chronic Liver Disease | 1216060010       | Oesophageal varices with bleeding                               |
| Chronic Liver Disease | 737961000006116  | Ligation of oesophageal varices                                 |
| Chronic Liver Disease | 286879013        | Chronic viral hepatitis B without delta-agent                   |
| Chronic Liver Disease | 303437019        | Bacterial portal cirrhosis                                      |
| Chronic Liver Disease | 5086991000006110 | Laennec cirrhosis, non-alcoholic                                |
| Chronic Liver Disease | 2675247013       | Liver disease due to cystic fibrosis                            |
| Chronic Liver Disease | 3713571000006110 | Congestive cirrhosis  |
| Chronic Liver Disease | 396392016        | Juvenile portal cirrhosis                                       |
| Chronic Liver Disease | 493707012        | Hypertrophic portal cirrhosis                                   |
| Chronic Liver Disease | 303442010        | Portal cirrhosis unspecified                                    |
| Chronic Liver Disease | 4657391000006110 | Balloon tamponade of esophageal varices                         |
| Chronic Liver Disease | 557081000006110  | Chronic viral hepatitis, unspecified                            |
| Chronic Liver Disease | 5493041000006110 | Cirrhosis, nonalcoholic   |
| Chronic Liver Disease | 864291000006118  | Total hepatectomy   |
| Chronic Liver Disease | 4657181000006110 | Rigid esophagogoscopic banding of esophageal varices            |
| Chronic Liver Disease | 3532180010       | Liver transplant recipient                                      |

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| Chronic Liver Disease | 21289010         | Secondary biliary cirrhosis  |
| Chronic Liver Disease | 2915211000006110 | Cirrhosis of pancreas  |
| Chronic Liver Disease | 2919481000006110 | Viral hepatitis B with hepatic coma  |
| Chronic Liver Disease | 123999018        | Congestive cirrhosis   |
| Chronic Liver Disease | 3010831000006110 | Hanot's cirrhosis  |
| Chronic Liver Disease | 768541000006118  | Intrahepatic atresia of bile duct  |
| Chronic Liver Disease | 353621011        | Laennec's cirrhosis, non-alcoholic   |
| Chronic Liver Disease | 2786011000006110 | Hepatic transplantation  |
| Chronic Liver Disease | 683211000000113  | Chronic hepatitis annual review  |
| Chronic Liver Disease | 161771000006119  | Sawaguchi roux-en-y procedure for biliary atresia                                      |
| Chronic Liver Disease | 268957016        | Rigid oesophagoscopy banding of oesophageal varices                                    |
| Chronic Liver Disease | 2781061000006110 | BOV - Bleeding oesophageal varices   |
| Chronic Liver Disease | 303453016        | Biliary cirrhosis NOS  |
| Chronic Liver Disease | 2676200013       | Orthotopic transplantation of whole liver  |
| Chronic Liver Disease | 4779741000006110 | Esophageal varices with bleeding, associated with another disorder                     |
| Chronic Liver Disease | 303410016        | Chronic hepatitis NOS  |
| Chronic Liver Disease | 6947461000006110 | Alcoholic cirrhosis  |
| Chronic Liver Disease | 660151000006116  | Extrahepatic atresia of bile duct  |
| Chronic Liver Disease | 396393014        | Non-alcoholic cirrhosis NOS  |
| Chronic Liver Disease | 286867013        | Other specified viral hepatitis with coma  |
| Chronic Liver Disease | 477604016        | Mixed portal cirrhosis   |
| Chronic Liver Disease | 3175071000006110 | CPH - Chronic persistent hepatitis   |
| Chronic Liver Disease | 303438012        | Cardituberculous cirrhosis   |
| Chronic Liver Disease | 163571000006112  | Endoscopic injection sclerotherapy to varices of oesophagus using rigid oesophagoscope |
| Chronic Liver Disease | 31211000006119   | Orthotopic transplantation of liver  |
| Chronic Liver Disease | 5077151000006110 | Blakemore intubation of esophagus  |

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| Chronic Liver Disease | 303401012         | Chronic active hepatitis   |
| Chronic Liver Disease | 4787261000006110  | Zooparasitic portal cirrhosis  |
| Chronic Liver Disease | 270234015         | Transplantation of liver NOS   |
| Chronic Liver Disease | 4661751000006110  | Orthotopic liver transplant  |
| Chronic Liver Disease | 3760701000006110  | BA - Biliary atresia   |
| Chronic Liver Disease | 1544611000006110  | Fiberoptic endoscopic rubber band ligation of upper gastrointestinal tract varices   |
| Chronic Liver Disease | 2159899016        | Autoimmune hepatitis   |
| Chronic Liver Disease | 12458801000000000 | [V]Liver transplanted  |
| Chronic Liver Disease | 353594015         | Alcoholic fibrosis and sclerosis of liver  |
| Chronic Liver Disease | 3847451000006110  | Extrahepatic biliary atresia   |
| Chronic Liver Disease | 500401000006116   | Auxillary liver transplant   |
| Chronic Liver Disease | 303439016         | Syphilitic portal cirrhosis  |
| Chronic Liver Disease | 150964016         | Gastric varices  |
| Chronic Liver Disease | 221111000000114   | Cirrhosis - non-alcoholic  |
| Chronic Liver Disease | 4656511000006110  | Open injection sclerotherapy to esophageal varices                                   |
| Chronic Liver Disease | 68294019          | Viral hepatitis with hepatic coma  |
| Chronic Liver Disease | 2824391000006110  | Alpers' disease  |
| Chronic Liver Disease | 3331291000006110  | Hepatorenal failure  |
| Chronic Liver Disease | 352567014         | Blakemore intubation of oesophagus   |
| Chronic Liver Disease | 314032018         | Congenital absence of hepatic ducts  |
| Chronic Liver Disease | 376141000000113   | Orthotopic transplantation of liver NEC  |
| Chronic Liver Disease | 394251013         | Roux-en-Y procedure for biliary atresia  |
| Chronic Liver Disease | 6617781000006110  | Bronzed cirrhosis  |
| Chronic Liver Disease | 303464018         | Other non-alcoholic chronic liver disease NOS  |
| Chronic Liver Disease | 114801000006118   | Tanner devascularisation for bleeding varices  |
| Chronic Liver Disease | 4657161000006110  | Endoscopic injection sclerotherapy to varices of esophagus using rigid esophagoscope |

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| Chronic Liver Disease | 862761000006111  | Oesophageal vessels ligated  |
| Chronic Liver Disease | 708811000006119  | Fibreoptic endoscopic injection sclerotherapy to oesophageal varices |
| Chronic Liver Disease | 553311000006111  | Chronic aggressive hepatitis   |
| Chronic Liver Disease | 2960631000006110 | OV - Oesophageal varices   |
| Chronic Liver Disease | 103853010        | Hepatic fibrosis   |
| Chronic Liver Disease | 325081012        | Hepatorenal syndrome as a complication of care                       |
| Chronic Liver Disease | 225661000006111  | Piggy back liver transplant  |
| Chronic Liver Disease | 226161000006113  | Pipe-stem portal cirrhosis   |
| Chronic Liver Disease | 353580016        | Chronic viral hepatitis B with delta-agent                           |
| Chronic Liver Disease | 286858013        | Hepatic coma due to viral hepatitis A                                |
| Chronic Liver Disease | 476611000006116  | Alcoholic cirrhosis of liver   |
| Chronic Liver Disease | 451442010        | Oesophageal varices in cirrhosis of the liver                        |
| Chronic Liver Disease | 456800015        | Oesophageal varices NOS  |
| Chronic Liver Disease | 221941000000113  | Atresia of bile duct   |
| Chronic Liver Disease | 353627010        | Hepatic fibrosis with hepatic sclerosis                              |
| Chronic Liver Disease | 3595991000006110 | Ligation of esophageal varices                                       |
| Chronic Liver Disease | 30458014         | Transplantation of liver   |
| Chronic Liver Disease | 739931000006118  | Liver transplant with complication, without blame                    |
| Chronic Liver Disease | 2526441000006110 | Cholangitic cirrhosis  |
| Chronic Liver Disease | 3847461000006110 | EHBA - Extrahepatic biliary atresia                                  |
| Chronic Liver Disease | 461319017        | [V]Assessment for liver transplant                                   |
| Chronic Liver Disease | 862771000006116  | Oesophageal varices injected   |
| Chronic Liver Disease | 603321000006118  | Cryptogenic cirrhosis  |
| Chronic Liver Disease | 3268012          | Congenital absence of bile duct                                      |
| Chronic Liver Disease | 85961019         | Cirrhosis of lung  |
| Chronic Liver Disease | 303440019        | Zooparasitic portal cirrhosis  |

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| Chronic Liver Disease | 3713561000006110 | Cardiac cirrhosis                                   |
| Chronic Liver Disease | 4657411000006110 | Balloon tamponade of esophagus                      |
| Chronic Liver Disease | 2781041000006110 | Oesophageal varices with haemorrhage                |
| Chronic Liver Disease | 3206871000006110 | Macronodular cirrhosis                              |
| Chronic Liver Disease | 550431000006116  | Childhood function cirrhosis                        |
| Chronic Liver Disease | 3515871000006110 | Fibrosis of liver                                   |
| Chronic Liver Disease | 2786021000006110 | LTx - Liver transplant                              |
| Chronic Liver Disease | 3760691000006110 | Atresia of bile ducts                               |
| Chronic Liver Disease | 2526461000006110 | Chronic nonsuppurative destructive cholangitis      |
| Chronic Liver Disease | 4661791000006110 | Piggy-back liver transplant                         |
| Chronic Liver Disease | 803961000006119  | Glycogenosis with hepatic cirrhosis                 |
| Chronic Liver Disease | 3011301000006110 | Arteriohepatic dysplasia                            |
| Chronic Liver Disease | 300779013        | Oesophageal varices without bleeding in diseases EC |
| Chronic Liver Disease | 2754711000006110 | Viral hepatitis A with hepatic coma                 |
| Chronic Liver Disease | 2960641000006110 | Oesophageal varix                                   |
| Chronic Liver Disease | 270232016        | Replacement of previous liver transplant            |
| Chronic Liver Disease | 2786001000006110 | Tx - Liver transplantation                          |
| Chronic Liver Disease | 2781081000006110 | BOV - Bleeding esophageal varices                   |
| Chronic Liver Disease | 557071000006112  | Chronic hepatitis C                                 |
| Chronic Liver Disease | 3847441000006110 | Congenital atresia of extrahepatic bile duct        |
| Chronic Liver Disease | 3748781000006110 | CH - Chronic hepatitis                              |
| Chronic Liver Disease | 53033015         | Alagille syndrome                                   |
| Chronic Liver Disease | 303433015        | Pigmentary portal cirrhosis                         |
| Chronic Liver Disease | 300775019        | Oesophageal varices in diseases EC                  |
| Chronic Liver Disease | 1763641000006110 | Cirrhosis of liver due to cystic fibrosis           |
| Chronic Liver Disease | 2598561000006110 | Cirrhosis-familial with pulmonary hypertension      |

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| Chronic Liver Disease | 3206891000006110 | PNC - Postnecrotic cirrhosis  |
| Chronic Liver Disease | 864281000006116  | Liver transplant  |
| Chronic Liver Disease | 4656741000006110 | Fibreoptic oesophagoscopy and injection sclerotherapy of varices      |
| Chronic Liver Disease | 300993011        | [X]Oesophageal varices in diseases classified elsewhere               |
| Chronic Liver Disease | 4656751000006110 | Fiberoptic endoscopic injection sclerotherapy to esophageal varices   |
| Chronic Liver Disease | 314035016        | Biliary atresia NOS   |
| Chronic Liver Disease | 8242561000006110 | Cirrhosis associated with cystic fibrosis                             |
| Chronic Liver Disease | 2526451000006110 | Cholestatic cirrhosis   |
| Chronic Liver Disease | 3331281000006110 | HRF - Hepatorenal failure   |
| Chronic Liver Disease | 3336411000006110 | Cirrhosis of lung   |
| Chronic Liver Disease | 3010811000006110 | Primary biliary cholangitis   |
| Chronic Liver Disease | 2518931000006110 | Agenesis of bile duct   |
| Chronic Liver Disease | 4656811000006110 | Fiberoptic esophagoscopy and banding of esophageal varices            |
| Chronic Liver Disease | 268827014        | Open operation on oesophageal varices NOS                             |
| Chronic Liver Disease | 4657171000006110 | Rigid oesophagoscopy and banding of oesophageal varices               |
| Chronic Liver Disease | 3431801000006110 | CLH - Chronic lobular hepatitis                                       |
| Chronic Liver Disease | 3507191000006110 | Chronic type B viral hepatitis  |
| Chronic Liver Disease | 5077191000006110 | Balloon tamponade of esophagus using Sengstaken-Blakemore tube        |
| Chronic Liver Disease | 24192017         | Oesophageal varices without bleeding                                  |
| Chronic Liver Disease | 460651015        | Transplanted liver present  |
| Chronic Liver Disease | 2816671000006110 | Hepatic cirrhosis   |
| Chronic Liver Disease | 396394015        | Other sequelae of chronic liver disease                               |
| Chronic Liver Disease | 2960661000006110 | OV - Esophageal varices   |
| Chronic Liver Disease | 286862019        | Hepatic coma due to viral hepatitis B                                 |
| Chronic Liver Disease | 4779771000006110 | Esophageal varices without bleeding, associated with another disorder |
| Chronic Liver Disease | 85441018         | Hepatorenal syndrome  |

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| Chronic Liver Disease | 3980471000006110 | Gastric varix  |
| Chronic Liver Disease | 4779751000006110 | Oesophageal varices without bleeding, associated with another disorder |
| Chronic Liver Disease | 5493051000006110 | Cirrhosis of liver not due to alcohol                                  |
| Chronic Liver Disease | 268885015        | Fibreoptic endoscopic banding of oesophageal varices                   |
| Chronic Liver Disease | 126721013        | Florid cirrhosis   |
| Chronic Liver Disease | 538121000000117  | Other specified compensation for liver failure                         |
| Chronic Liver Disease | 2960621000006110 | Esophageal varices   |
| Chronic Liver Disease | 127487019        | Chronic hepatitis  |
| Chronic Liver Disease | 987751000006119  | Oesophageal varices injected   |
| Chronic Liver Disease | 303489012        | Liver abscess and chronic liver disease causing sequelae NOS           |
| Chronic Liver Disease | 5975531000006110 | Esophageal varices in cirrhosis of the liver                           |
| Chronic Liver Disease | 300784019        | Oesophageal varices in diseases EC NOS                                 |
| Chronic Liver Disease | 5992721000006110 | Esophageal varices in alcoholic cirrhosis of the liver                 |
| Chronic Liver Disease | 4407011000006110 | Chronic type C viral hepatitis   |
| Chronic Liver Disease | 352929018        | Exploration of liver transplant  |
| Chronic Liver Disease | 2579818016       | Laennec's cirrhosis  |
| Chronic Liver Disease | 6947471000006110 | Alcoholic liver cirrhosis  |
| Chronic Liver Disease | 6941941000006110 | PC - Portal cirrhosis  |
| Chronic Liver Disease | 731231000006114  | Macronodular cirrhosis of liver  |
| Chronic Liver Disease | 1786709019       | Pigmentary cirrhosis of liver  |
| Chronic Liver Disease | 268812014        | Open operations on oesophageal varices                                 |
| Chronic Liver Disease | 4657191000006110 | Rigid esophagoscopy and banding of esophageal varices                  |
| Chronic Liver Disease | 303441015        | Infectious cirrhosis   |
| Chronic Liver Disease | 6617771000006110 | Bronze cirrhosis   |
| Chronic Liver Disease | 4656781000006110 | Fibreoptic oesophagoscopy and banding of oesophageal varices           |
| Chronic Liver Disease | 4779711000006110 | Esophageal varices associated with another disorder                    |



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| Chronic Liver Disease | 353595019         | Alcoholic hepatic failure                                 |
| Chronic Liver Disease | 511611000006113   | Bile duct atresia   |
| Chronic Liver Disease | 2960651000006110  | Esophageal varix  |
| Chronic Liver Disease | 1680591000006110  | Chronic hepatitis annual review - enhanced services admin |
| Chronic Liver Disease | 303525019         | Hepatic granulomas in sarcoidosis                         |
| Chronic Liver Disease | 2781021000006110  | Bleeding esophageal varices                               |
| Chronic Liver Disease | 303404016         | Autoimmune chronic active hepatitis                       |
| Chronic Liver Disease | 113108015         | Congenital hypoplasia of bile duct                        |
| Chronic Liver Disease | 5334681000006110  | Intrahepatic biliary atresia                              |
| Chronic Liver Disease | 3269016           | Agenesis of bile duct                                     |
| Chronic Liver Disease | 2781031000006110  | Esophageal varices with hemorrhage                        |
| Chronic Liver Disease | 288169017         | [X]Other chronic viral hepatitis                          |
| Chronic Liver Disease | 270233014         | Other specified transplantation of liver                  |
| Chronic Liver Disease | 69895016          | Chronic persistent hepatitis                              |
| Chronic Liver Disease | 4044018           | Biliary cirrhosis   |
| Chronic Liver Disease | 3760671000006110  | Congenital biliary atresia                                |
| Chronic Liver Disease | 1736361000000110  | Cystic fibrosis related cirrhosis                         |
| Chronic Liver Disease | 394102015         | Other specified open operation on oesophageal varices     |
| Chronic Liver Disease | 2598551000006110  | ICC - Indian childhood cirrhosis                          |
| Chronic Liver Disease | 11267010          | Indian childhood cirrhosis                                |
| Chronic Liver Disease | 12456711000000000 | [V]Assessment for liver transplant                        |
| Chronic Liver Disease | 303414013         | Unilobular portal cirrhosis                               |
| Chronic Liver Disease | 95368015          | Chronic lobular hepatitis                                 |
| Chronic Liver Disease | 57989014          | Portal hypertension                                       |
| Chronic Liver Disease | 4661781000006110  | Auxiliary liver transplant                                |
| Chronic Liver Disease | 303614019         | Primary sclerosing cholangitis                            |

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| Chronic Liver Disease  | 4787131000006110  | CAH - Chronic active hepatitis  |
| Coronary Heart Disease | 299765010         | Angina pectoris NOS   |
| Coronary Heart Disease | 865171000006113   | Coronary artery operation NOS   |
| Coronary Heart Disease | 1547671000006110  | Percutaneous cor balloon angiop 3 more stents cor art NEC   |
| Coronary Heart Disease | 865201000006112   | Coronary A revasc. by-pass  |
| Coronary Heart Disease | 4230015           | Repair of aneurysm of coronary artery   |
| Coronary Heart Disease | 299709018         | Anterior myocardial infarction NOS  |
| Coronary Heart Disease | 299835014         | Ischaemic heart disease NOS   |
| Coronary Heart Disease | 271172011         | Other specified operations on coronary artery   |
| Coronary Heart Disease | 271080018         | Other autograft replacement of coronary artery  |
| Coronary Heart Disease | 482961000006115   | Anginal Control: No attacks   |
| Coronary Heart Disease | 1488440011        | Coronary heart disease medication review  |
| Coronary Heart Disease | 271136016         | Other open operations on coronary artery  |
| Coronary Heart Disease | 455423016         | Postoperative myocardial infarction, unspecified  |
| Coronary Heart Disease | 271073015         | Saphenous vein graft replacement of one coronary artery   |
| Coronary Heart Disease | 1780501013        | Acute non-ST segment elevation myocardial infarction  |
| Coronary Heart Disease | 451372015         | H/O: Treatment for ischaemic heart disease  |
| Coronary Heart Disease | 453269016         | [V]Status following coronary angioplasty NOS  |
| Coronary Heart Disease | 12626301000000000 | QOF (Quality and Outcomes Framework) secondary prevention of coronary heart disease quality indicator-related care invitation |
| Coronary Heart Disease | 7845011           | Unstable angina   |
| Coronary Heart Disease | 219531000000117   | MI - acute myocardial infarction  |
| Coronary Heart Disease | 460133017         | Coronary heart disease annual review  |
| Coronary Heart Disease | 271161018         | Repair of coronary artery NEC   |
| Coronary Heart Disease | 59952018          | Nocturnal angina  |
| Coronary Heart Disease | 311461000000116   | Insertion of drug-eluting coronary artery stent   |
| Coronary Heart Disease | 89731000006112    | Transluminal balloon angioplasty of coronary artery OS  |

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| Coronary Heart Disease | 1576271000006110 | Cause of Death- Myocardial Infarction  |
| Coronary Heart Disease | 359071000000111  | Percutaneous transluminal angioplasty of vein  |
| Coronary Heart Disease | 1547631000006110 | Percutaneous transluminal balloon angioplasty with insertion of stent into coronary artery |
| Coronary Heart Disease | 299720018        | Other acute myocardial infarction NOS  |
| Coronary Heart Disease | 299804015        | Other specified chronic ischaemic heart disease NOS  |
| Coronary Heart Disease | 2855301000006110 | Myocardial infarction  |
| Coronary Heart Disease | 271105012        | Revision of bypass for coronary artery   |
| Coronary Heart Disease | 264494013        | Angina control - poor  |
| Coronary Heart Disease | 1547651000006110 | Perc tran ball angio ins 3 or more drug elut stents cor art                                |
| Coronary Heart Disease | 264493019        | Angina control - good  |
| Coronary Heart Disease | 264492012        | Angina control   |
| Coronary Heart Disease | 406961000000113  | Coronary heart disease monitoring telephone invite   |
| Coronary Heart Disease | 5887611000006110 | Exercise-induced angina  |
| Coronary Heart Disease | 238641000006117  | Percutaneous transluminal balloon angioplasty of one coronary artery                       |
| Coronary Heart Disease | 1539331000006110 | H/O: coronary heart disease  |
| Coronary Heart Disease | 865181000006111  | Coronary artery venous graft   |
| Coronary Heart Disease | 3371411000006110 | CHD - Coronary heart disease   |
| Coronary Heart Disease | 272117011        | Rotary blade angioplasty   |
| Coronary Heart Disease | 451132018        | [V]Presence of coronary artery bypass graft  |
| Coronary Heart Disease | 352222018        | Angina bullosa haemorrhagica   |
| Coronary Heart Disease | 299757012        | Angina pectoris  |
| Coronary Heart Disease | 8459551000006110 | Coronary heart disease monitoring invitation   |
| Coronary Heart Disease | 4032016          | Healed myocardial infarction   |
| Coronary Heart Disease | 256460011        | ECG: myocardial infarct NOS  |
| Coronary Heart Disease | 865281000006115  | Angioplasty of coronary artery   |
| Coronary Heart Disease | 144819018        | Variant angina pectoris  |

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| Coronary Heart Disease | 884141000006116  | Coronary thrombosis   |
| Coronary Heart Disease | 1547971000006110 | Percutaneous transluminal balloon angioplasty with insertion of stent into pulmonary artery |
| Coronary Heart Disease | 264495014        | Angina control - improving  |
| Coronary Heart Disease | 810811000006116  | H/O: myocardial infarct at less than 60   |
| Coronary Heart Disease | 856011000006116  | Angina control - unsatisfactory   |
| Coronary Heart Disease | 2160096015       | Coronary artery bypass graft occlusion  |
| Coronary Heart Disease | 271148018        | Transluminal balloon angioplasty of coronary artery NOS                                     |
| Coronary Heart Disease | 299721019        | Acute myocardial infarction NOS   |
| Coronary Heart Disease | 865291000006117  | Coronary Angioplasty  |
| Coronary Heart Disease | 1734241000000110 | Referral to cardiac rehabilitation programme  |
| Coronary Heart Disease | 2534674015       | Chronic myocardial ischaemia  |
| Coronary Heart Disease | 494261017        | Worsening angina  |
| Coronary Heart Disease | 905381000006117  | [RFC] Angina  |
| Coronary Heart Disease | 460687010        | History of placement of stent for coronary artery disease                                   |
| Coronary Heart Disease | 4031011          | Old myocardial infarction   |
| Coronary Heart Disease | 865191000006114  | Insertn coronary artery stent   |
| Coronary Heart Disease | 459488019        | Transient myocardial ischaemia  |
| Coronary Heart Disease | 350354017        | Silent myocardial ischaemia   |
| Coronary Heart Disease | 302275011        | Ludwig's angina   |
| Coronary Heart Disease | 299782012        | Single coronary vessel disease  |
| Coronary Heart Disease | 216244010        | Canadian Cardiovascular Society grading of angina pectoris grade                            |
| Coronary Heart Disease | 350346019        | Triple vessel disease of the heart  |
| Coronary Heart Disease | 37443015         | Heart attack  |
| Coronary Heart Disease | 483917014        | Coronary artery anomaly   |
| Coronary Heart Disease | 1734121000000110 | Referral to cardiac rehabilitation programme declined                                       |
| Coronary Heart Disease | 348644016        | Coronary artery bypass graft operations   |

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| Coronary Heart Disease | 72571000006115   | Unstable angina   |
| Coronary Heart Disease | 457285013        | Cardiac rehabilitation                                      |
| Coronary Heart Disease | 1780491019       | Acute ST segment elevation myocardial infarction            |
| Coronary Heart Disease | 1547661000006110 | Perc translum balloon angioplasty insert 1-2 stents cor art |
| Coronary Heart Disease | 454270010        | Intravascular ultrasound of coronary artery                 |
| Coronary Heart Disease | 1780444014       | Coronary heart disease monitoring 1st letter                |
| Coronary Heart Disease | 299750014        | Other acute and subacute ischaemic heart disease NOS        |
| Coronary Heart Disease | 1780442013       | Attends coronary heart disease monitoring                   |
| Coronary Heart Disease | 459483011        | Coronary heart disease monitoring refused                   |
| Coronary Heart Disease | 2534664018       | Ischaemic heart disease                                     |
| Coronary Heart Disease | 1489353017       | Cardiac rehabilitation - phase 3                            |
| Coronary Heart Disease | 1489354011       | Cardiac rehabilitation - phase 4                            |
| Coronary Heart Disease | 482911000006118  | Angina grading (canadian cardiovascular society)            |
| Coronary Heart Disease | 1235225010       | Prinzmetal's angina   |
| Coronary Heart Disease | 1780446011       | Coronary heart disease monitoring 3rd letter                |
| Coronary Heart Disease | 1221554018       | Other autograft bypass of coronary artery                   |
| Coronary Heart Disease | 220231000000118  | Coronary artery operation                                   |
| Coronary Heart Disease | 482941000006119  | Angina pectoris NOS   |
| Coronary Heart Disease | 1654891000000110 | Coronary angioplasty planned                                |
| Coronary Heart Disease | 634751000006116  | ECG myocardial ischaemia                                    |
| Coronary Heart Disease | 7847015          | Crescendo angina  |
| Coronary Heart Disease | 2536395017       | Coronary artery disease                                     |
| Coronary Heart Disease | 299711010        | Acute lateral myocardial infarction                         |
| Coronary Heart Disease | 1227364015       | History of coronary artery bypass grafting                  |
| Coronary Heart Disease | 682481000006118  | Myocardial infarction aborted                               |
| Coronary Heart Disease | 299707016        | Acute anterior myocardial infarction                        |

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| Coronary Heart Disease | 264497018        | Angina control NOS  |
| Coronary Heart Disease | 447324018        | Acute Q-wave infarct  |
| Coronary Heart Disease | 271169016        | Coronary artery bypass graft                                |
| Coronary Heart Disease | 251679016        | H/O: angina pectoris  |
| Coronary Heart Disease | 1823891000006110 | Coronary heart disease confirmed                            |
| Coronary Heart Disease | 498328016        | Angina at rest  |
| Coronary Heart Disease | 1774801000000110 | Coronary heart disease care plan                            |
| Coronary Heart Disease | 256451015        | ECG: myocardial ischaemia NOS                               |
| Coronary Heart Disease | 1785743019       | Rotary blade coronary angioplasty                           |
| Coronary Heart Disease | 299714019        | Acute myocardial infarction of inferior wall                |
| Coronary Heart Disease | 350376014        | Silent myocardial infarction                                |
| Coronary Heart Disease | 39111000006114   | Other acute and subacute ischaemic heart disease            |
| Coronary Heart Disease | 321671000006112  | Coronary artery structure                                   |
| Coronary Heart Disease | 1484833014       | Coronary heart disease review                               |
| Coronary Heart Disease | 161481000006112  | Aortocoronary artery bypass graft with saphenous vein graft |
| Coronary Heart Disease | 299712015        | True posterior myocardial infarction                        |
| Coronary Heart Disease | 1780445010       | Coronary heart disease monitoring 2nd letter                |
| Coronary Heart Disease | 300874013        | [X]Other forms of angina pectoris                           |
| Coronary Heart Disease | 98087016         | Angina decubitus  |
| Coronary Heart Disease | 908791000006113  | [RFC] Coronary heart disease                                |
| Coronary Heart Disease | 455651000006114  | Acute anteroseptal myocardial infarction                    |
| Coronary Heart Disease | 457531000006110  | Acute inferolateral myocardial infarction                   |
| Coronary Heart Disease | 482801000006110  | Abdominal angina  |
| Coronary Heart Disease | 461192018        | [V]Observation for suspected myocardial infarction          |
| Coronary Heart Disease | 8079871000006110 | Coronary heart disease monitoring telephone invitation      |
| Coronary Heart Disease | 300879015        | [X]Other forms of chronic ischaemic heart disease           |

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| Coronary Heart Disease | 238561000006119  | Percutaneous transluminal balloon angioplasty of bypass graft of coronary artery |
| Coronary Heart Disease | 271079016        | Saphenous vein graft replacement coronary artery NOS                             |
| Coronary Heart Disease | 1547691000006110 | Perc translum balloon angioplasty stenting coronary art NOS                      |
| Coronary Heart Disease | 272107018        | Percutaneous balloon angioplasty of artery                                       |
| Coronary Heart Disease | 855991000006115  | Angina control - stable  |
| Coronary Heart Disease | 216589012        | Cardiovascular Limitations and Symptoms Profile angina score                     |
| Coronary Heart Disease | 1895641000006110 | On coronary heart disease register   |
| Coronary Heart Disease | 238571000006114  | Percutaneous transluminal balloon angioplasty of multiple coronary arteries      |
| Coronary Heart Disease | 810821000006112  | H/O: myocardial infarct at greater than 60                                       |
| Coronary Heart Disease | 350350014        | New onset angina   |
| Coronary Heart Disease | 449302011        | Referral to cardiac rehabilitation nurse   |
| Coronary Heart Disease | 451369010        | H/O: Myocardial infarction in last year  |
| Coronary Heart Disease | 1771631000006110 | Attended cardiac rehabilitation  |
| Coronary Heart Disease | 299718016        | Other acute myocardial infarction  |
| Coronary Heart Disease | 299710011        | Acute posterior myocardial infarction  |
| Coronary Heart Disease | 39773018         | Coronary artery spasm  |
| Coronary Heart Disease | 299834013        | Other specified ischaemic heart disease  |
| Coronary Heart Disease | 271173018        | Coronary artery operations NOS   |
| Coronary Heart Disease | 256452010        | ECG: myocardial infarction   |
| Coronary Heart Disease | 299776014        | Chronic ischaemic heart disease  |
| Coronary Heart Disease | 7844010          | Preinfarction syndrome   |
| Coronary Heart Disease | 1780517019       | Coronary heart disease monitoring default  |
| Coronary Heart Disease | 458410010        | Post infarct angina  |
| Coronary Heart Disease | 271081019        | Autograft replacement of one coronary artery NEC                                 |
| Coronary Heart Disease | 299783019        | Double coronary vessel disease   |
| Coronary Heart Disease | 256454011        | ECG: old myocardial infarction   |

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| Coronary Heart Disease | 1576301000006110 | Cause of Death- Acute Myocardial Infarction                               |
| Coronary Heart Disease | 1741581000006110 | Excepted from myocardial infarction quality indicators - informed dissent |
| Coronary Heart Disease | 482811000006113  | Angina at rest  |
| Coronary Heart Disease | 394541000006112  | [X]Ischaemic heart diseases   |
| Coronary Heart Disease | 2536354015       | Insertion of coronary artery stent  |
| Coronary Heart Disease | 208365015        | Postoperative myocardial infarction                                       |
| Coronary Heart Disease | 905351000006113  | [RFC] Myocardial infarction (MI)  |
| Coronary Heart Disease | 455641000006112  | Acute anterolateral myocardial infarction                                 |
| Coronary Heart Disease | 884151000006119  | Myocardial Infarction   |
| Coronary Heart Disease | 271171016        | Other bypass of coronary artery NOS                                       |
| Coronary Heart Disease | 1489351015       | Cardiac rehabilitation - phase 1  |
| Coronary Heart Disease | 1228282017       | Saphenous vein graft replacement of coronary artery                       |
| Coronary Heart Disease | 271149014        | Other therapeutic transluminal operations on coronary artery              |
| Coronary Heart Disease | 1780447019       | Coronary heart disease monitoring verbal invitation                       |
| Coronary Heart Disease | 350348018        | Stable angina   |
| Coronary Heart Disease | 451370011        | H/O: Angina in last year  |
| Coronary Heart Disease | 939671000006116  | Cardiac rehabilitation book given   |
| Coronary Heart Disease | 2534218019       | Cardiac rehabilitation declined   |
| Coronary Heart Disease | 299805019        | Other chronic ischaemic heart disease NOS                                 |
| Coronary Heart Disease | 1591641000006110 | Coronary artery calcium score   |
| Coronary Heart Disease | 161451000006116  | Saphenous vein graft replacement of coronary artery                       |
| Coronary Heart Disease | 5040181000006110 | Coronary artery bypass grafts x 3   |
| Coronary Heart Disease | 1489352010       | Cardiac rehabilitation - phase 2  |
| Coronary Heart Disease | 264496010        | Angina control - worsening  |
| Coronary Heart Disease | 1484939014       | Coronary heart disease monitoring administration                          |
| Coronary Heart Disease | 2486801000000110 | Cardiac rehabilitation programme offered                                  |



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| Coronary Heart Disease | 856451000006113  | Possible angina  |
| Coronary Heart Disease | 299812011        | Subsequent myocardial infarction of inferior wall  |
| Coronary Heart Disease | 484402013        | Percutaneous transluminal laser coronary angioplasty   |
| Coronary Heart Disease | 1734201000000110 | Referral to cardiac rehabilitation programme not indicated   |
| Coronary Heart Disease | 1547641000006110 | Percutaneous transluminal balloon angioplasty and insertion of drug eluting stent into coronary artery |
| Coronary Heart Disease | 2112641000000110 | Cardiac rehabilitation programme completed   |
| Coronary Heart Disease | 442204010        | Angina on effort   |
| Coronary Heart Disease | 271162013        | Endarterectomy of coronary artery  |
| Coronary Heart Disease | 2117731000000110 | Angina self-management plan agreed   |
| Coronary Heart Disease | 650021000006116  | Examination for suspected cardiovascular disease   |
| Coronary Heart Disease | 299741012        | Preinfarction syndrome   |
| Coronary Heart Disease | 411904010        | Aspirin prophylaxis for ischaemic heart disease  |
| Coronary Heart Disease | 1736191000000110 | Referral to cardiac rehabilitation service by secondary care   |
| Coronary Heart Disease | 230021000006115  | Personal history of myocardial infarction  |
| Coronary Heart Disease | 455422014        | Postoperative subendocardial myocardial infarction   |
| Coronary Heart Disease | 89711000006118   | Percutaneous transluminal coronary angioplasty   |
| Coronary Heart Disease | 635641000006111  | ECG:shows myocardial ischaemia   |
| Coronary Heart Disease | 84241012         | Coronary artery aneurysm   |
| Coronary Heart Disease | 238821000006111  | Percutaneous balloon coronary angioplasty  |
| Coronary Heart Disease | 459487012        | Refractory angina  |
| Coronary Heart Disease | 271546012        | Percutaneous transluminal angioplasty of carotid artery  |
| Coronary Heart Disease | 1550991000000110 | Coronary artery bypass graft operation planned   |
| Coronary Heart Disease | 2537480011       | IHD - Ischaemic heart disease  |
| Coronary Heart Disease | 3371421000006110 | Coronary heart disease   |
| Coronary Heart Disease | 1780518012       | Coronary heart disease monitoring check done   |
| Coronary Heart Disease | 1856391000006110 | Coronary heart disease monitoring in primary care  |

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| Coronary Heart Disease | 459859010        | Asymptomatic coronary heart disease   |
| Coronary Heart Disease | 314321000000119  | Suspected ischaemic heart disease   |
| Coronary Heart Disease | 1741571000006110 | Exception reporting - myocardial infarction quality indicators                                |
| Coronary Heart Disease | 909401000006115  | [RFC] Cardiac rehabilitation  |
| Coronary Heart Disease | 5944391000006110 | Seen by cardiac rehabilitation nurse  |
| Coronary Heart Disease | 460686018        | [V]Presence of aortocoronary bypass graft   |
| Coronary Heart Disease | 460681000006116  | Acute transmural myocardial infarction of unspecif site                                       |
| Coronary Heart Disease | 1549091000006110 | Percutaneous transluminal balloon angioplasty of vein   |
| Coronary Heart Disease | 1221061012       | Open angioplasty of coronary artery   |
| Coronary Heart Disease | 299808017        | Subsequent myocardial infarction  |
| Coronary Heart Disease | 1738171000006110 | History of myocardial infarction  |
| Coronary Heart Disease | 933021000006113  | Angioplasty of coronary artery  |
| Coronary Heart Disease | 271087015        | Allograft bypass of coronary artery   |
| Coronary Heart Disease | 94884017         | Acute myocardial infarction   |
| Coronary Heart Disease | 1752201000000110 | Frequency of angina   |
| Dementia               | 1972211000006110 | Dementia in Alzheimer's disease with late onset, other mixed symptoms                         |
| Dementia               | 2620431000000110 | Shared care prescribing of drug for dementia  |
| Dementia               | 1972931000006110 | Mixed cortical and subcortical vascular dementia, other mixed symptoms                        |
| Dementia               | 2439711000000110 | Dementia care plan review declined  |
| Dementia               | 696161000006115  | Multi-infarct dementia  |
| Dementia               | 299325013        | [X]Other Alzheimer's disease  |
| Dementia               | 1972251000006110 | Dementia in Alzheimer's dis, atypical or mixed type, other symptoms, predominantly delusional |
| Dementia               | 1972181000006110 | Dementia in Alzheimer's disease with late onset, other symptoms, predominantly delusional     |
| Dementia               | 6900241000006110 | Dementia in Alzheimer's disease - type 1  |
| Dementia               | 1971401000006110 | Dementia in Alzheimer's disease with early onset, without additional symptoms                 |
| Dementia               | 295685013        | Dementia due to Pick's disease  |
| Dementia               | 428201000006119  | Subcortical vascular dementia   |
| Dementia               | 1972541000006110 | Vascular dementia of acute onset, other symptoms, predominantly depressive                    |
| Dementia               | 6024071000006110 | Lewy body dementia  |
| Dementia               | 294648012        | Senile dementia with delirium   |
| Dementia               | 1972751000006110 | Subcortical vascular dementia, other symptoms, predominantly hallucinatory                    |

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| Dementia | 295671015         | [X]Dementia in Alzheimer's dis, atypical or mixed type   |
| Dementia | 431681000006117   | Vascular dementia  |
| Dementia | 423351000006115   | [X]Presenile dementia,Alzheimer's type   |
| Dementia | 914941000006112   | [D] Dementia   |
| Dementia | 294642013         | Presenile dementia with depression   |
| Dementia | 359151000006113   | [X] Senile dementia, depressed or paranoid type  |
| Dementia | 3802641000006110  | LBD - Lewy body disease  |
| Dementia | 6897271000006110  | Dementia in Alzheimer's disease - type 2<br>Vascular dementia of acute onset, other symptoms, predominantly<br>hallucinatory |
| Dementia | 1972521000006110  | Dementia in Alzheimer's disease, unspecified, other mixed symptoms   |
| Dementia | 1972471000006110  | Dementia care plan declined  |
| Dementia | 2439671000000110  | Vascular dementia of acute onset, other mixed symptoms   |
| Dementia | 1972571000006110  | VAD - Vascular dementia  |
| Dementia | 294718018         | Dementia in conditions EC  |
| Dementia | 21256010          | Presenile dementia   |
| Dementia | 294645010         | Senile dementia with paranoia  |
| Dementia | 294646011         | Senile dementia with depression  |
| Dementia | 45046017          | Alzheimer's disease  |
| Dementia | 1972071000006110  | Unspecified dementia, other symptoms, predominantly depressive   |
| Dementia | 294653019         | Arteriosclerotic dementia with delirium  |
| Dementia | 294652012         | Uncomplicated arteriosclerotic dementia  |
| Dementia | 359141000006111   | [X] Senile dementia NOS  |
| Dementia | 6897241000006110  | Dementia of the Alzheimers type with early onset   |
| Dementia | 294641018         | Presenile dementia with paranoia   |
| Dementia | 362941000006113   | [X]Alcoholic dementia NOS  |
| Dementia | 1976831000006110  | Vascular dementia, unspecified, other mixed symptoms   |
| Dementia | 294635013         | Uncomplicated senile dementia  |
| Dementia | 12370651000000000 | MVAD - Mixed vascular Alzheimer dementia<br>Vascular dementia, unspecified, other symptoms, predominantly<br>depressive      |
| Dementia | 1973551000006110  | H/O: dementia  |
| Dementia | 251625013         | Senile dementia with depressive or paranoid features   |
| Dementia | 294644014         | [X]Predominantly cortical dementia   |
| Dementia | 423221000006117   | Behavioural variant of frontotemporal dementia   |
| Dementia | 7755121000006110  | Dementia in Alzheimer's disease with late onset, other symptoms,<br>predominantly hallucinatory                              |
| Dementia | 1972191000006110  | Subcortical vascular dementia, without additional symptoms   |
| Dementia | 1972711000006110  | [X]Delirium superimposed on dementia   |
| Dementia | 295714013         | Dementia of the Lewy body type   |
| Dementia | 3802651000006110  | Alcoholic dementia   |
| Dementia | 346929012         | Dementia in Alzheimer's dis, atypical or mixed type, without additional<br>symptoms  |
| Dementia | 1972231000006110  | Mixed cortical and subcortical vascular dementia, without additional<br>symptoms   |
| Dementia | 1972821000006110  | [X]Arteriosclerotic dementia   |
| Dementia | 363791000006112   |  |

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| Dementia | 499946014        | Alzheimer's disease with early onset                              |
| Dementia | 2931251000006110 | Alzheimer dementia  |
| Dementia | 882201000006116  | Senile dementia - simple type                                     |
| Dementia | 423391000006114  | [X]Primary degen dementia, Alzheimer's type, presenile onset      |
| Dementia | 2445691000000110 | Dementia advance care plan review declined                        |
| Dementia | 999961000006114  | Excepted from dementia quality indicators - patient unsuitable    |
| Dementia | 425901000006116  | [X]Senile dementia,Alzheimer's type                               |
| Dementia | 497559016        | Arteriosclerotic dementia   |
| Dementia | 2403101000000110 | Dementia medication review  |
| Dementia | 2439631000000110 | Dementia care plan reviewed                                       |
| Dementia | 294647019        | Senile dementia with depressive or paranoid features NOS          |
| Dementia | 745381000006119  | Lewy body disease   |
| Dementia | 5618261000006110 | Dementia of frontal lobe type                                     |
| Dementia | 363021000006113  | [X]Alzheimer's dementia unspec                                    |
| Dementia | 398571000006112  | Mixed cortical and subcortical vascular dementia                  |
| Dementia | 295690011        | [X]Dementia in other specified diseases classif elsewhere         |
| Dementia | 363041000006118  | [X]Alzheimer's disease type 2                                     |
| Dementia | 423381000006111  | [X]Primary degen dementia of Alzheimer's type, senile onset       |
| Dementia | 1972041000006110 | Unspecified dementia, other symptoms, predominantly delusional    |
| Dementia | 2248021000000110 | Dementia care plan  |
| Dementia | 408501000000115  | Dementia monitoring telephone invitation                          |
| Dementia | 359241000006119  | Dementia  |
| Dementia | 295687017        | Dementia due to Huntington chorea                                 |
| Dementia | 1972061000006110 | Unspecified dementia, other symptoms, predominantly hallucinatory |
| Dementia | 1949651000006110 | Dementia stage at diagnosis - late (severe)                       |
| Dementia | 914921000006117  | [D] Vascular dementia   |
| Dementia | 1823871000006110 | Dementia confirmed  |
| Dementia | 295681016        | [X]Vascular dementia, unspecified                                 |
| Dementia | 1856611000006110 | Dementia monitoring in secondary care                             |
| Dementia | 882211000006118  | Senile dementia-acute confused                                    |
| Dementia | 408401000000119  | Dementia annual review  |
| Dementia | 6024061000006110 | Senile dementia of the Lewy body type                             |
| Dementia | 406841000000115  | Dementia monitoring administration                                |
| Dementia | 22408016         | Pick's disease  |
| Dementia | 363031000006111  | [X]Alzheimer's disease type 1                                     |
| Dementia | 1576281000006110 | Cause of Death- Alzheimer'S Disease                               |
| Dementia | 1949721000006110 | Dementia post diagnostic support (PDS) - transition arrangements  |
| Dementia | 3195111000006110 | Lewy body   |
| Dementia | 299641000000112  | Diffuse Lewy body disease   |
| Dementia | 295686014        | Dementia due to Creutzfeldt Jakob disease                         |
| Dementia | 2743011000000110 | Dementia advance care plan agreed                                 |
| Dementia | 431691000006119  | Vascular dementia of acute onset                                  |
| Dementia | 376531000006119  | Dementia in Alzheimer's disease with early onset                  |
| Dementia | 407461000000119  | Dementia monitoring   |
| Dementia | 7874771000006110 | Delirium superimposed on dementia                                 |

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| Dementia | 1950501000006110 | Dementia PDS (Scot) - planning for future care status   |
| Dementia | 408421000000111  | Dementia monitoring second letter   |
| Dementia | 295668011        | [X]Dementia in Alzheimer's disease  |
| Dementia | 1972871000006110 | Mixed cortical and subcortical vascular dementia, other symptoms, predominantly hallucinatory |
| Dementia | 148381000006115  | Senile/presenile dementia   |
| Dementia | 1949641000006110 | Dementia stage at diagnosis - mid (moderate)  |
| Dementia | 882171000006115  | Dementia  |
| Dementia | 1933001000006110 | Referral to dementia early intervention service   |
| Dementia | 1949691000006110 | Dementia support plan (Scot) in place at 12 months  |
| Dementia | 1949671000006110 | Dementia stage at diagnosis - not known   |
| Dementia | 6900181000006110 | Primary degenerative dementia of the Alzheimer type, senile onset                             |
| Dementia | 1972021000006110 | Unspecified dementia, without additional symptoms   |
| Dementia | 1972131000006110 | Dementia in Alzheimer's disease with early onset, other symptoms, predominantly depressive    |
| Dementia | 1932091000006110 | 3D study - problems with dementia management  |
| Dementia | 1856631000006110 | Did not attend dementia monitoring  |
| Dementia | 1972341000006110 | Dementia in Alzheimer's dis, atypical or mixed type, other mixed symptoms                     |
| Dementia | 399031000006111  | [X]Multi-infarct dementia   |
| Dementia | 1774581000006110 | Refer to dementia care advisor  |
| Dementia | 1972791000006110 | Subcortical vascular dementia, other mixed symptoms   |
| Dementia | 939491000006118  | [RFC] Dementia  |
| Dementia | 295688010        | Dementia in Parkinsons disease  |
| Dementia | 914931000006119  | [D] Dementia with Lewy bodies   |
| Dementia | 8214731000006110 | Dementia monitoring invitation  |
| Dementia | 1973461000006110 | Vascular dementia, unspecified, without additional symptoms                                   |
| Dementia | 1856601000006110 | Dementia monitoring in primary care   |
| Dementia | 882191000006119  | Senile and presenile dementias  |
| Dementia | 2502971000006110 | Dementia associated with alcoholism   |
| Dementia | 2345801000000110 | Dementia advance care plan declined   |
| Dementia | 1972831000006110 | Mixed cortical and subcortical vascular dementia, other symptoms, predominantly delusional    |
| Dementia | 1972501000006110 | Vascular dementia of acute onset, other symptoms, predominantly delusional                    |
| Dementia | 401760017        | Other alcoholic dementia  |
| Dementia | 500317011        | Alzheimer's disease with late onset   |
| Dementia | 1972371000006110 | Dementia in Alzheimer's disease, unspecified, without additional symptoms                     |
| Dementia | 376571000006116  | [X]Dementia in human immunodef virus [HIV] disease  |
| Dementia | 408481000000112  | Dementia monitoring verbal invitation   |
| Dementia | 294655014        | Arteriosclerotic dementia with depression   |
| Dementia | 295680015        | [X]Other vascular dementia  |
| Dementia | 6897251000006110 | Presenile dementia, Alzheimer's type  |
| Dementia | 1973501000006110 | Vascular dementia, unspecified, other symptoms, predominantly delusional                      |
| Dementia | 2290431000000110 | Antipsychotic drug therapy for dementia   |

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| Dementia | 2284371000000110  | Assessment of psychotic and behavioural symptoms of dementia                                     |
| Dementia | 1972451000006110  | Dementia in Alzheimer's disease, unspecified, other symptoms, predominantly depressive           |
| Dementia | 1949701000006110  | Dementia support plan (Scot) partly in place at 12 months  |
| Dementia | 359081000006118   | [X] Presenile dementia NOS   |
| Dementia | 8024201000006110  | Mixed dementia   |
| Dementia | 2221421000000110  | Referral to dementia service   |
| Dementia | 1973221000006110  | Other vascular dementia, without additional symptoms   |
| Dementia | 2931241000006110  | Alzheimer disease  |
| Dementia | 1972311000006110  | Dementia in Alzheimer's dis, atypical or mixed type, other symptoms, predominantly depressive    |
| Dementia | 2345881000000110  | Dementia advance care plan agreed  |
| Dementia | 1973271000006110  | Other vascular dementia, other symptoms, predominantly delusional                                |
| Dementia | 1949761000006110  | Dementia PDS transition - referred for community care support                                    |
| Dementia | 1973381000006110  | Other vascular dementia, other symptoms, predominantly depressive                                |
| Dementia | 294654013         | Arteriosclerotic dementia with paranoia  |
| Dementia | 2345931000000110  | Review of dementia advance care plan   |
| Dementia | 1972911000006110  | Mixed cortical and subcortical vascular dementia, other symptoms, predominantly depressive       |
| Dementia | 294688019         | Drug-induced dementia  |
| Dementia | 2439591000000110  | Dementia care plan agreed  |
| Dementia | 1973531000006110  | Vascular dementia, unspecified, other symptoms, predominantly hallucinatory                      |
| Dementia | 12106371000000000 | BPSD - behavioral and psychological symptoms of dementia   |
| Dementia | 294656010         | Arteriosclerotic dementia NOS  |
| Dementia | 1973341000006110  | Other vascular dementia, other symptoms, predominantly hallucinatory                             |
| Dementia | 6900221000006110  | SDAT - Senile dementia, Alzheimer's type   |
| Dementia | 7798761000006110  | CDR (Clinical Dementia Rating) score   |
| Dementia | 1972681000006110  | Multi-infarct dementia, other mixed symptoms   |
| Dementia | 408461000000115   | Dementia monitoring third letter   |
| Dementia | 294643015         | Presenile dementia NOS   |
| Dementia | 359101000006114   | Cerebral degeneration presenting primarily with dementia   |
| Dementia | 294638010         | Presenile dementia with delirium   |
| Dementia | 1972291000006110  | Dementia in Alzheimer's dis, atypical or mixed type, other symptoms, predominantly hallucinatory |
| Dementia | 1972141000006110  | Dementia in Alzheimer's disease with early onset, other mixed symptoms                           |
| Dementia | 1949621000006110  | Dementia stage at diagnosis  |
| Dementia | 1972731000006110  | Subcortical vascular dementia, other symptoms, predominantly delusional                          |
| Dementia | 408361000000111   | Dementia monitoring first letter   |
| Dementia | 294637017         | Uncomplicated presenile dementia   |
| Dementia | 2620471000000110  | Shared care prescribing of drugs for dementia declined   |
| Dementia | 1972481000006110  | Vascular dementia of acute onset, without additional symptoms                                    |
| Dementia | 1949611000006110  | Dementia post diagnostic support (Scotland)  |
| Dementia | 295684012         | Dementia associated with another disease   |
| Dementia | 1973401000006110  | Other vascular dementia, other mixed symptoms  |

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| Dementia | 2127581000000110  | Suspected dementia   |
| Dementia | 26545010          | Senile dementia  |
| Dementia | 295672010         | [X]Dementia in Alzheimer's disease, unspecified  |
| Dementia | 915111000006112   | Dementia review  |
| Dementia | 6900201000006110  | Dementia of the Alzheimers type, late onset  |
| Dementia | 1949631000006110  | Dementia stage at diagnosis - early (mild)<br>Dementia in Alzheimer's disease with late onset, without additional symptoms |
| Dementia | 1972171000006110  | Ischaemic vascular dementia  |
| Dementia | 7840631000006110  | Unspecified dementia, other mixed symptoms   |
| Dementia | 1972081000006110  | Dementia advance care plan<br>Subcortical vascular dementia, other symptoms, predominantly depressive                      |
| Dementia | 2445471000000110  | Dementia in Alzheimer's disease with late onset  |
| Dementia | 1972771000006110  | [RFC] Alzheimer's disease  |
| Dementia | 376541000006112   | [D] Dementia in Alzheimer's disease  |
| Dementia | 905791000006115   | Dementia review with third party   |
| Dementia | 914951000006114   | Type II diabetes mellitus with peripheral angiopathy   |
| Dementia | 915121000006116   | DKA - diabetic ketoacidosis  |
| Diabetes | 84961000006116    | Iatrogenic hyperinsulinaemia   |
| Diabetes | 6953901000006110  | Mononeuropathy associated with type 1 diabetes mellitus  |
| Diabetes | 3963921000006110  | Mononeuropathy associated with type 2 diabetes mellitus  |
| Diabetes | 12702371000000000 | Diabetic amyotrophy  |
| Diabetes | 12702401000000000 | On examination - Right diabetic foot at risk   |
| Diabetes | 65526011          | Diabetes care by hospital only   |
| Diabetes | 5975301000006110  | Other specified diabetes mellitus with neurological comps  |
| Diabetes | 216195015         | Unstable insulin dependent diabetes mellitus   |
| Diabetes | 13761000006115    | Type I diabetes mellitus with ulcer  |
| Diabetes | 429972014         | Nervous system disorder due to diabetes mellitus   |
| Diabetes | 84821000006118    | Gastroparesis due to diabetes mellitus type I  |
| Diabetes | 616391000006114   | Type 1 diabetic dietary review   |
| Diabetes | 7708051000006110  | Type I diabetes mellitus in remission  |
| Diabetes | 1665751000000110  | Type 2 diabetes mellitus with ulcer  |
| Diabetes | 2288011000000110  | Disorder of eye with type 2 diabetes mellitus  |
| Diabetes | 84631000006119    | Brittle diabetes   |
| Diabetes | 12336871000000000 | Diabetes mellitus induced by non-steroid drugs without complication  |
| Diabetes | 19931010          | PPDR - Proliferative diabetic retinopathy  |
| Diabetes | 967631000006115   | Type II diabetes mellitus  |
| Diabetes | 4771421000006110  | Exudative maculopathy with type 2 diabetes mellitus  |
| Diabetes | 493774016         | Exudative maculopathy associated with type I diabetes mellitus   |
| Diabetes | 12335671000000000 | Diabetic monitoring - injection sites  |
| Diabetes | 6954991000006110  | Diabetic peripheral angiopathy   |
| Diabetes | 777231000006119   | Gangrene associated with type 2 diabetes mellitus  |
| Diabetes | 302011            | Diabetic mononeuritis multiplex  |
| Diabetes | 6975211000006110  | Diabetes mellitus with multiple complications  |
| Diabetes | 297492014         | Type 1 diabetes mellitus maturity onset  |
| Diabetes | 292565014         |  |
| Diabetes | 292553010         |  |

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| Diabetes | 292550013         | Type I diabetes mellitus - poor control                          |
| Diabetes | 6866421000006110  | On examination - left chronic diabetic foot ulcer                |
| Diabetes | 15518018          | Secondary diabetes mellitus                                      |
| Diabetes | 292496015         | Diabetes mellitus with nephropathy NOS                           |
| Diabetes | 292495016         | Other specified diabetes mellitus with renal complications       |
| Diabetes | 292484010         | Hyperosmolar coma associated with diabetes mellitus              |
| Diabetes | 616641000006110   | Diabetes mellitus, juvenile type, with ketoacidosis              |
| Diabetes | 299621000000117   | Gastroparesis with type 2 diabetes mellitus                      |
| Diabetes | 7708091000006110  | Polyneuropathy due to type 1 diabetes mellitus                   |
| Diabetes | 1230890017        | Autonomic neuropathy due to diabetes                             |
| Diabetes | 12336541000000000 | Retinopathy co-occurrent and due to type 2 diabetes mellitus     |
| Diabetes | 2288041000000110  | Type 1 diabetes mellitus in remission                            |
| Diabetes | 84531000006118    | Type 2 diabetes mellitus with mononeuropathy                     |
| Diabetes | 2415191000000110  | Diabetic peripheral neuropathic pain                             |
| Diabetes | 12705001000000000 | Exudative maculopathy associated with type 1 diabetes mellitus   |
| Diabetes | 264726017         | Diabetes management plan given                                   |
| Diabetes | 84791000006110    | Polyneuropathy due to diabetes mellitus type I                   |
| Diabetes | 1223147012        | Insulin treated Type II diabetes mellitus                        |
| Diabetes | 914261000006119   | Diabetes type 2 with nephropathy                                 |
| Diabetes | 12186021000000000 | Autonomic neuropathy co-occurrent and due to diabetes mellitus   |
| Diabetes | 451411017         | O/E - Left diabetic foot at risk                                 |
| Diabetes | 84481000006116    | Type 2 diabetes mellitus - poor control                          |
| Diabetes | 84931000006113    | Neurological disorder with diabetes type 2                       |
| Diabetes | 459294012         | Type I diabetes mellitus with arthropathy                        |
| Diabetes | 84461000006114    | Type 1 diabetes mellitus without complication                    |
| Diabetes | 2159977011        | O/E - right eye proliferative diabetic retinopathy               |
| Diabetes | 84991000006112    | Type II diabetes mellitus with retinopathy                       |
| Diabetes | 429970018         | Unstable type I diabetes mellitus                                |
| Diabetes | 84651000006114    | Type I diabetes mellitus   |
| Diabetes | 149278011         | Iatrogenic hyperinsulinism                                       |
| Diabetes | 913671000006113   | Type I diabetes mellitus with retinopathy                        |
| Diabetes | 292479016         | Diabetes mellitus NOS with ketoacidosis                          |
| Diabetes | 913791000006119   | Type I diabetes mellitus with mononeuropathy                     |
| Diabetes | 292581016         | Type II diabetes mellitus with ulcer                             |
| Diabetes | 280591000006115   | Non-insulin-dependent diabetes mellitus with neuro comps         |
| Diabetes | 84581000006117    | Type 2 diabetes mellitus with ophthalmic complications           |
| Diabetes | 6961081000006110  | Gangrene associated with type 1 diabetes mellitus                |
| Diabetes | 914391000006116   | Insulin treated Type 2 diabetes mellitus                         |
| Diabetes | 4392211000006110  | Diabetes with peripheral circulatory disorder                    |
| Diabetes | 459167016         | Type 2 diabetes mellitus with hypoglycaemic coma                 |
| Diabetes | 1667891000000110  | Hyperosmolar non-ketotic state in type II diabetes mellitus      |
| Diabetes | 6981621000006110  | Persistent proteinuria associated with type II diabetes mellitus |
| Diabetes | 6980041000006110  | Diabetic peripheral circulatory disorder                         |
| Diabetes | 913521000006113   | Neurological disorder with type 1 diabetes mellitus              |
| Diabetes | 264718013         | Diabetic-uncooperative patient                                   |



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|----------|-------------------|--|
| Diabetes | 264704018         | Diabetic drug side effects   |
| Diabetes | 264682013         | Diabetic on insulin  |
| Diabetes | 6056601000006110  | DIGAMI - diabetes mellitus insulin-glucose infusion in acute myocardial infarction |
| Diabetes | 12086301000000000 | Disorder of right macula co-occurrent and due to diabetes mellitus                 |
| Diabetes | 264728016         | Annual diabetic blood test   |
| Diabetes | 1488396017        | O/E - Left diabetic foot - ulcerated   |
| Diabetes | 292478012         | Other specified diabetes mellitus with ketoacidosis                                |
| Diabetes | 197984010         | Type 1 diabetes mellitus   |
| Diabetes | 2288061000000110  | Type II diabetes mellitus in remission   |
| Diabetes | 292512019         | Diabetes mellitus NOS with neurological manifestation                              |
| Diabetes | 84711000006117    | Type I diabetes mellitus with hypoglycaemic coma                                   |
| Diabetes | 377001000006117   | [X]Diabetes mellitus   |
| Diabetes | 84921000006110    | Renal disorder due to type 2 diabetes mellitus                                     |
| Diabetes | 616501000006112   | Disorder due to type 2 diabetes mellitus   |
| Diabetes | 928601000006118   | Ketoacidotic coma in type 2 diabetes mellitus                                      |
| Diabetes | 84471000006119    | Type 2 diabetes mellitus   |
| Diabetes | 292626017         | Diabetic complication  |
| Diabetes | 297552010         | Asymptomatic diabetic neuropathy   |
| Diabetes | 121589010         | Diabetes mellitus  |
| Diabetes | 6546341000006110  | On examination - Left diabetic foot at high risk                                   |
| Diabetes | 7783451000006110  | Hypoglycaemic coma co-occurrent and due to diabetes mellitus type II               |
| Diabetes | 84911000006119    | Type II diabetes mellitus with multiple complications                              |
| Diabetes | 913591000006110   | Skin ulcer associated with diabetes mellitus                                       |
| Diabetes | 494564012         | Type I diabetes mellitus   |
| Diabetes | 1488898011        | Hyperosmolar non-ketotic state in type 2 diabetes mellitus                         |
| Diabetes | 84781000006112    | Type I diabetes mellitus with peripheral angiopathy                                |
| Diabetes | 771491000006110   | Insulin-dependent diabetes mellitus with ophthalmic comps                          |
| Diabetes | 84391000006111    | Type 1 diabetes mellitus with neuropathic arthropathy                              |
| Diabetes | 297758012         | Diabetic retinopathy NOS   |
| Diabetes | 84701000006115    | Type I diabetes mellitus with gangrene   |
| Diabetes | 73466011          | Non-insulin dependent diabetes mellitus  |
| Diabetes | 84281000006115    | Type 1 diabetes mellitus   |
| Diabetes | 12224751000000000 | Severe nonproliferative retinopathy co-occurrent and due to diabetes mellitus      |
| Diabetes | 4636411000006110  | Diet controlled diabetes mellitus  |
| Diabetes | 317347010         | [D]Gangrene of toe in diabetic   |
| Diabetes | 305158015         | Diabetic glomerulopathy  |
| Diabetes | 616651000006112   | Diabetes mellitus, juvenile type, with ketoacidotic coma                           |
| Diabetes | 2532976019        | O/E - left chronic diabetic foot ulcer   |
| Diabetes | 72721000006113    | Unstable type I diabetes mellitus  |
| Diabetes | 6546261000006110  | On examination - Right diabetic foot at high risk                                  |
| Diabetes | 6982511000006110  | Diabetic retinopathy associated with type II diabetes mellitus                     |
| Diabetes | 264707013         | Diabetic - good control  |
| Diabetes | 914231000006111   | Type II diabetes mellitus with mononeuropathy                                      |
| Diabetes | 928511000006116   | Type I diabetes mellitus with ketoacidosis   |

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| Diabetes | 914031000006118   | Renal disorder associated with type II diabetes mellitus          |
| Diabetes | 12703991000000000 | [X]Unspecified diabetes mellitus with renal complications         |
| Diabetes | 292489017         | Diabetes mellitus NOS with ketoacidotic coma                      |
| Diabetes | 12489851000000000 | Type II diabetes mellitus with exudative maculopathy              |
| Diabetes | 12702391000000000 | Diabetic cataract associated with type 2 diabetes mellitus        |
| Diabetes | 12183221000000000 | Cataract co-occurrent and due to diabetes mellitus                |
| Diabetes | 12332271000000000 | Retinopathy with type 1 diabetes mellitus                         |
| Diabetes | 616561000006113   | Diabetes mellitus, adult with gangrene                            |
| Diabetes | 6985421000006110  | Skin ulcer associated with diabetes mellitus                      |
| Diabetes | 6515201000006110  | NPDR - Non proliferative diabetic retinopathy                     |
| Diabetes | 616591000006117   | Diabetes mellitus, juvenile +peripheral circulatory disorder      |
| Diabetes | 6546241000006110  | On examination - Right diabetic foot at low risk                  |
| Diabetes | 772131000006111   | Insulin dependent diab mell with neuropathic arthropathy          |
| Diabetes | 12220711000000000 | Iritis co-occurrent and due to diabetes mellitus                  |
| Diabetes | 1223148019        | Insulin treated non-insulin dependent diabetes mellitus           |
| Diabetes | 913901000006112   | Type 1 diabetes mellitus with diabetic cataract                   |
| Diabetes | 82373015          | Diabetic polyneuropathy   |
| Diabetes | 12704991000000000 | Ketoacidotic coma in type 2 diabetes mellitus                     |
| Diabetes | 297964010         | Diabetic iritis   |
| Diabetes | 483886014         | Maturity onset diabetes in youth                                  |
| Diabetes | 4808891000006110  | Diabetic cheirarthropathy   |
| Diabetes | 451410016         | O/E - Right diabetic foot at risk                                 |
| Diabetes | 975251000006111   | O/E - right eye stable treated proliferative diabetic retinopathy |
| Diabetes | 771331000006116   | Insulin dependent diabetes mellitus with arthropathy              |
| Diabetes | 6051171000006110  | Insulin dependent diabetes mellitus with arthropathy              |
| Diabetes | 297510017         | Diabetic mononeuritis NOS   |
| Diabetes | 345486016         | Diabetic neuropathy   |
| Diabetes | 84941000006115    | Type II diabetes mellitus with neuropathic arthropathy            |
| Diabetes | 264727014         | Diabetic annual review  |
| Diabetes | 77727018          | Insulin dependent diabetes mellitus                               |
| Diabetes | 913681000006111   | Insulin dependent diabetes mellitus - poor control                |
| Diabetes | 928471000006114   | Type I diabetes mellitus with persistent proteinuria              |
| Diabetes | 12704961000000000 | Diabetic oculopathy associated with type 2 diabetes mellitus      |
| Diabetes | 967701000006116   | Lipoatrophic diabetes mellitus                                    |
| Diabetes | 12702381000000000 | Diabetic oculopathy due to type I diabetes mellitus               |
| Diabetes | 303846016         | Nephrotic syndrome in diabetes mellitus                           |
| Diabetes | 2159978018        | O/E - left eye proliferative diabetic retinopathy                 |
| Diabetes | 84891000006116    | Type II diabetes mellitus with hypoglycaemic coma                 |
| Diabetes | 213141000006111   | Pre-existing diabetes mellitus, unspecified                       |
| Diabetes | 928571000006113   | Type II diabetes mellitus with persistent microalbuminuria        |
| Diabetes | 292523015         | Diabetes mellitus NOS with peripheral circulatory disorder        |
| Diabetes | 309180011         | Mixed diabetic ulcer - foot                                       |
| Diabetes | 73294018          | Diabetic cataract   |
| Diabetes | 12332101000000000 | Cataract due to diabetes mellitus type 2                          |
| Diabetes | 297754014         | Preproliferative diabetic retinopathy                             |

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| Diabetes | 914081000006117   | Type II diabetes mellitus with neurological complications            |
| Diabetes | 616661000006114   | Diabetes mellitus, juvenile type, with renal manifestation           |
| Diabetes | 9093013           | Diabetic retinopathy   |
| Diabetes | 2159170012        | Patient on maximal tolerated therapy for diabetes                    |
| Diabetes | 5634901000006110  | Diabetic foot  |
| Diabetes | 616971000006114   | Diabetic Charcot's arthropathy                                       |
| Diabetes | 12220691000000000 | Advanced maculopathy co-occurrent and due to diabetes mellitus       |
| Diabetes | 2549896013        | O/E - sight threatening diabetic retinopathy                         |
| Diabetes | 2576431000006110  | DR - Diabetic retinopathy  |
| Diabetes | 616611000006111   | Disorder due to type 1 diabetes mellitus                             |
| Diabetes | 6050081000006110  | Type 1 diabetes mellitus with hypoglycemic coma                      |
| Diabetes | 309179013         | Neuropathic diabetic ulcer - foot                                    |
| Diabetes | 913921000006119   | Insulin dependent diab mell with peripheral angiopathy               |
| Diabetes | 7500191000006110  | Maturity onset diabetes of the young, type 1                         |
| Diabetes | 6761821000006110  | On examination - right eye preproliferative diabetic retinopathy     |
| Diabetes | 6515211000006110  | BDR - Background diabetic retinopathy                                |
| Diabetes | 12224761000000000 | Severe NPDR (nonproliferative diabetic retinopathy)                  |
| Diabetes | 345492010         | Diabetic mononeuropathy  |
| Diabetes | 1488395018        | O/E - Right diabetic foot - ulcerated                                |
| Diabetes | 84751000006116    | Type I diabetes mellitus with neurological complications             |
| Diabetes | 913781000006117   | Type 1 diabetes mellitus with mononeuropathy                         |
| Diabetes | 6979991000006110  | Renal disorder associated with type I diabetes mellitus              |
| Diabetes | 299261000000111   | Diabetic 6 month review  |
| Diabetes | 84871000006117    | Cataract due to diabetes mellitus type 2                             |
| Diabetes | 787111000006112   | IDDM-Insulin dependent diabetes mellitus                             |
| Diabetes | 292589019         | Type II diabetes mellitus - poor control                             |
| Diabetes | 223291000000111   | Maturity onset diabetes  |
| Diabetes | 6515171000006110  | Nonproliferative diabetic retinopathy                                |
| Diabetes | 913831000006114   | Insulin dependent diabetes mellitus with nephropathy                 |
| Diabetes | 84811000006114    | Type I diabetes mellitus with retinopathy                            |
| Diabetes | 12336861000000000 | Disorder of nervous system co-occurrent and due to diabetes mellitus |
| Diabetes | 914241000006118   | Polyneuropathy due to type 2 diabetes mellitus                       |
| Diabetes | 6954121000006110  | Mononeuropathy associated with type II diabetes mellitus             |
| Diabetes | 12332751000000000 | Mononeuropathy with type 1 diabetes mellitus                         |
| Diabetes | 12702411000000000 | Type II diabetes mellitus with neurological complications            |
| Diabetes | 8022441000006110  | Neuropathic arthropathy due to type 1 diabetes mellitus              |
| Diabetes | 292590011         | Type II diabetes mellitus poorly controlled                          |
| Diabetes | 12174801000000000 | Eye disorder due to diabetes mellitus                                |
| Diabetes | 616351000006115   | Diabetes mellitus with gangrene                                      |
| Diabetes | 457330012         | Type II diabetes mellitus without complication                       |
| Diabetes | 457325013         | Type I diabetes mellitus without complication                        |
| Diabetes | 84351000006117    | Type 1 diabetes mellitus with mononeuropathy                         |
| Diabetes | 12086331000000000 | Diabetic maculopathy of left eye                                     |
| Diabetes | 12331061000000000 | Mononeuropathy co-occurrent and due to type 2 diabetes mellitus      |
| Diabetes | 772161000006119   | Insulin dependent diabetes mellitus                                  |

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| Diabetes | 2159948010        | Diabetic retinopathy 12 month review                                     |
| Diabetes | 4717371000006110  | Diabetic stabilization   |
| Diabetes | 98476015          | Proliferative diabetic retinopathy                                       |
| Diabetes | 913471000006110   | Insulin-dependent diabetes mellitus with ophthalmic comps                |
| Diabetes | 292548017         | Type 1 diabetes mellitus - poor control                                  |
| Diabetes | 2262341000000110  | Conversion to insulin in secondary care                                  |
| Diabetes | 6961101000006110  | Diabetes type 1 with gangrene  |
| Diabetes | 12295441000000000 | Nonproliferative retinopathy co-occurrent and due to diabetes mellitus   |
| Diabetes | 7708071000006110  | Gastroparesis due to diabetes mellitus type II                           |
| Diabetes | 1665721000000110  | Type 2 diabetic dietary review   |
| Diabetes | 913821000006111   | Type I diabetes mellitus with polyneuropathy                             |
| Diabetes | 12363691000000000 | Gastroparesis co-occurrent and due to type 2 diabetes mellitus           |
| Diabetes | 913711000006112   | Insulin dependent diabetes maturity onset                                |
| Diabetes | 6970631000006110  | Peripheral circulatory disorder associated with type I diabetes mellitus |
| Diabetes | 178800012         | Insulin coma   |
| Diabetes | 13781000006113    | Other specified diabetes mellitus with other spec comps                  |
| Diabetes | 13791000006111    | Other specified diabetes mellitus with periph circ comps                 |
| Diabetes | 13811000006110    | Other specified diabetes mellitus with unspecified comps                 |
| Diabetes | 622221000000118   | Maternally inherited diabetes mellitus                                   |
| Diabetes | 84321000006114    | Type 1 diabetes mellitus with diabetic cataract                          |
| Diabetes | 6972451000006110  | Diabetes type 1 with neurological disorder                               |
| Diabetes | 84561000006110    | Type 2 diabetes mellitus with neurological complications                 |
| Diabetes | 7065531000006110  | Latent autoimmune diabetes mellitus in adult (LADA)                      |
| Diabetes | 12704981000000000 | Diabetic retinopathy associated with type 2 diabetes mellitus            |
| Diabetes | 6951281000006110  | Kidney disorder associated with type 2 diabetes mellitus                 |
| Diabetes | 771371000006118   | Insulin dependent diabetes mellitus with mononeuropathy                  |
| Diabetes | 12485441000000000 | NIDDM with peripheral circulatory disorder                               |
| Diabetes | 8022461000006110  | Diabetic neuropathic arthropathy due to type 1 diabetes mellitus         |
| Diabetes | 6546281000006110  | On examination - Right diabetic foot - ulcerated                         |
| Diabetes | 12332111000000000 | Cataract co-occurrent and due to diabetes mellitus type 2                |
| Diabetes | 850691000006118   | Hyperosmolar non-ketotic state in type 2 diabetes mellitus               |
| Diabetes | 2262381000000110  | Conversion to insulin by diabetes specialist nurse                       |
| Diabetes | 84511000006112    | Type 2 diabetes mellitus with gangrene                                   |
| Diabetes | 4808881000006110  | Diabetic hand syndrome   |
| Diabetes | 358035014         | Insulin lipohypertrophy  |
| Diabetes | 928461000006119   | Persistent proteinuria associated with type 1 diabetes mellitus          |
| Diabetes | 1488404014        | O/E - Right diabetic foot at moderate risk                               |
| Diabetes | 457156014         | [V]Admitted for conversion to insulin                                    |
| Diabetes | 1488398016        | O/E - Left diabetic foot at high risk                                    |
| Diabetes | 1666911000000110  | O/E - Left diabetic foot at increased risk                               |
| Diabetes | 12334621000000000 | Neurological disorder co-occurrent and due to type 1 diabetes mellitus   |
| Diabetes | 3712861000006110  | Disorder associated with diabetes mellitus                               |
| Diabetes | 6959801000006110  | Diabetic cataract associated with type II diabetes mellitus              |
| Diabetes | 1488393013        | O/E - Right diabetic foot at low risk                                    |
| Diabetes | 1227774019        | [V]Dietary counselling in diabetes mellitus                              |

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| Diabetes | 881501000006110   | Diabetes + neuropathy  |
| Diabetes | 297755010         | Advanced diabetic maculopathy  |
| Diabetes | 1780311019        | Type 1 diabetes mellitus with persistent microalbuminuria              |
| Diabetes | 453100011         | H/O: Admission in last year for diabetes foot problem                  |
| Diabetes | 841011000006112   | Severe nonproliferative diabetic retinopathy                           |
| Diabetes | 12224581000000000 | Advanced retinal disease co-occurrent and due to diabetes mellitus     |
| Diabetes | 2160090014        | Diabetes mellitus induced by non-steroid drugs                         |
| Diabetes | 913771000006115   | Insulin dependent diabetes mellitus with mononeuropathy                |
| Diabetes | 309177010         | Ischaemic ulcer diabetic foot  |
| Diabetes | 1786715019        | Bronzed diabetes   |
| Diabetes | 84591000006119    | Type 2 diabetes mellitus with peripheral angiopathy                    |
| Diabetes | 6953861000006110  | Diabetic ketoacidosis  |
| Diabetes | 1734281000000110  | Diabetic erectile dysfunction review                                   |
| Diabetes | 1488397014        | O/E - Left diabetic foot at low risk                                   |
| Diabetes | 457329019         | Type 2 diabetes mellitus without complication                          |
| Diabetes | 1658861000000110  | Type I diabetic dietary review   |
| Diabetes | 12705081000000000 | Gastroparesis due to type 2 diabetes mellitus                          |
| Diabetes | 292606016         | Malnutrition-related diabetes mellitus with ketoacidosis               |
| Diabetes | 616421000006118   | Eye disorder due to diabetes mellitus                                  |
| Diabetes | 913481000006113   | Type 1 diabetes mellitus with ophthalmic complications                 |
| Diabetes | 12180771000000000 | Lumbosacral radiculoplexus neuropathy with diabetes mellitus           |
| Diabetes | 12335981000000000 | Peripheral vascular disorder co-occurrent and due to diabetes mellitus |
| Diabetes | 771341000006114   | Insulin dependent diabetes mellitus with diabetic cataract             |
| Diabetes | 13771000006110    | Other specified diabetes mellitus with ophthalmic complicatn           |
| Diabetes | 1484867016        | Non proliferative diabetic retinopathy                                 |
| Diabetes | 345487013         | Diabetes mellitus with neuropathy                                      |
| Diabetes | 4757991000006110  | Type 1 diabetes mellitus with hyperosmolar coma                        |
| Diabetes | 928551000006115   | Type II diabetes mellitus with persistent proteinuria                  |
| Diabetes | 411891014         | Unstable diabetes  |
| Diabetes | 459695017         | Diabetic weight reducing diet  |
| Diabetes | 12221111000000000 | Neuropathy co-occurrent and due to diabetes mellitus                   |
| Diabetes | 280531000006119   | Non-insulin dependent diabetes mellitus with nephropathy               |
| Diabetes | 459292011         | Type 1 diabetes mellitus with arthropathy                              |
| Diabetes | 459311019         | Type II diabetes mellitus with arthropathy                             |
| Diabetes | 459308015         | Type 2 diabetes mellitus with peripheral angiopathy                    |
| Diabetes | 459306016         | Type II diabetes mellitus with peripheral angiopathy                   |
| Diabetes | 6972441000006110  | Neurological disorder associated with type I diabetes mellitus         |
| Diabetes | 459295013         | Type I diabetes mellitus with neuropathic arthropathy                  |
| Diabetes | 283544013         | Diabetic emergency hospital admission                                  |
| Diabetes | 12363671000000000 | Gastroparesis co-occurrent and due to type 1 diabetes mellitus         |
| Diabetes | 13751000006117    | Other specified diabetes mellitus with multiple comps                  |
| Diabetes | 197761014         | Type 2 diabetes mellitus   |
| Diabetes | 6982151000006110  | Disorder due to type II diabetes mellitus                              |
| Diabetes | 293759015         | Diabetic renal disease   |
| Diabetes | 84801000006111    | Type I diabetes mellitus with renal complications                      |

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| Diabetes | 771361000006113   | Insulin dependent diabetes mellitus with hypoglycaemic coma               |
| Diabetes | 6985011000006110  | Peripheral circulatory disorder associated with type II diabetes mellitus |
| Diabetes | 928581000006111   | Ketoacidosis in type 2 diabetes mellitus                                  |
| Diabetes | 6977421000006110  | Ketoacidosis in type II diabetes mellitus                                 |
| Diabetes | 189721000000113   | Secondary diabetes mellitus without complication                          |
| Diabetes | 1966311000006110  | Diabetic on oral treatment and glucagon-like peptide 1 receptor agonist   |
| Diabetes | 169731000006118   | Retinal abnormality - diabetes-related                                    |
| Diabetes | 301161000000113   | Insulin needles changed less than once a day                              |
| Diabetes | 8022471000006110  | Diabetes mellitus type 1 with diabetic Charcot's arthropathy              |
| Diabetes | 4758121000006110  | Insulin-dependent diabetes maturity onset                                 |
| Diabetes | 84371000006110    | Type 1 diabetes mellitus with nephropathy                                 |
| Diabetes | 12334611000000000 | Neurological disorder with type 1 diabetes mellitus                       |
| Diabetes | 317348017         | [D]Widespread diabetic foot gangrene                                      |
| Diabetes | 914041000006111   | Type II diabetes mellitus with renal complications                        |
| Diabetes | 127041000006110   | Steroid-induced diabetes  |
| Diabetes | 616531000006116   | Diabetes mellitus, adult onset, with ketoacidosis                         |
| Diabetes | 3963911000006110  | Iatrogenic hyperinsulinism  |
| Diabetes | 7281511000006110  | Type 2 diabetes mellitus uncontrolled                                     |
| Diabetes | 913981000006115   | Insulin dependent diab mell with neuropathic arthropathy                  |
| Diabetes | 5110081000006110  | Hypoglycemic event in diabetes  |
| Diabetes | 281171000006119   | Type II diabetes mellitus uncontrolled                                    |
| Diabetes | 6979251000006110  | Diabetes mellitus type 2 with ketoacidotic coma                           |
| Diabetes | 264679015         | Diabetic on diet only   |
| Diabetes | 84901000006117    | Mononeuropathy with type 2 diabetes mellitus                              |
| Diabetes | 84551000006113    | Type 2 diabetes mellitus with nephropathy                                 |
| Diabetes | 84881000006119    | Type II diabetes mellitus with gangrene                                   |
| Diabetes | 12183231000000000 | Cataract due to diabetes mellitus   |
| Diabetes | 6546431000006110  | On examination - Right diabetic foot at moderate risk                     |
| Diabetes | 12220641000000000 | Mononeuritis multiplex co-occurrent and due to diabetes mellitus          |
| Diabetes | 84761000006119    | Type I diabetes mellitus with neuropathic arthropathy                     |
| Diabetes | 84501000006114    | Type 2 diabetes mellitus with diabetic cataract                           |
| Diabetes | 84721000006113    | Mononeuropathy with type 1 diabetes mellitus                              |
| Diabetes | 719541000006111   | Malnutrition-related diabetes mellitus with coma                          |
| Diabetes | 2159980012        | Maculopathy of left eye with diabetes mellitus                            |
| Diabetes | 84671000006116    | Type I diabetes mellitus maturity onset                                   |
| Diabetes | 881471000006115   | Diabetes with coma  |
| Diabetes | 12186011000000000 | Autonomic neuropathy with diabetes mellitus                               |
| Diabetes | 6969921000006110  | Neurologic disorder associated with type II diabetes mellitus             |
| Diabetes | 84601000006110    | Type 2 diabetes mellitus with polyneuropathy                              |
| Diabetes | 674961000006118   | Peripheral circulatory disorder associated with type 2 diabetes mellitus  |
| Diabetes | 401531012         | Diabetic - poor control   |
| Diabetes | 84521000006116    | Type 2 diabetes mellitus with hypoglycaemic coma                          |
| Diabetes | 85001000006117    | Type II diabetes mellitus with ulcer                                      |
| Diabetes | 12221251000000000 | Maculopathy due to diabetes mellitus                                      |
| Diabetes | 928611000006115   | Ketoacidotic coma in type II diabetes mellitus                            |

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| Diabetes | 6959091000006110  | Persistent microalbuminuria associated with type II diabetes mellitus |
| Diabetes | 771381000006115   | Insulin dependent diabetes mellitus with multiple complicatn          |
| Diabetes | 12220661000000000 | Asymptomatic neuropathy co-occurrent and due to diabetes mellitus     |
| Diabetes | 4808921000006110  | Diabetic neuropathic arthropathy                                      |
| Diabetes | 4723641000006110  | Diabetic emergency hospital admission                                 |
| Diabetes | 6050041000006110  | Insulin dependent diabetes mellitus with hypoglycaemic coma           |
| Diabetes | 913841000006116   | Renal disorder associated with type 1 diabetes mellitus               |
| Diabetes | 12704401000000000 | Diabetic oculopathy   |
| Diabetes | 6761841000006110  | On examination - left eye preproliferative diabetic retinopathy       |
| Diabetes | 7063141000006110  | Diabetes mellitus co-occurrent and due to cystic fibrosis             |
| Diabetes | 928591000006114   | Type II diabetes mellitus with ketoacidosis                           |
| Diabetes | 12174811000000000 | Disorder of eye co-occurrent and due to diabetes mellitus             |
| Diabetes | 292482014         | Diabetes mellitus, juvenile type, with hyperosmolar coma              |
| Diabetes | 6969931000006110  | Diabetes type 2 with neurological disorder                            |
| Diabetes | 771411000006117   | Insulin dependent diabetes mellitus with retinopathy                  |
| Diabetes | 5109621000006110  | MODY - Maturity onset diabetes glucokinase-related                    |
| Diabetes | 280541000006112   | Non-insulin dependent diabetes mellitus with polyneuropathy           |
| Diabetes | 616481000006119   | Diabetes mellitus, adult onset, + neurological manifestation          |
| Diabetes | 493773010         | NIDDM - Non-insulin dependent diabetes mellitus                       |
| Diabetes | 84831000006115    | Type I diabetes mellitus without complication                         |
| Diabetes | 6987011000006110  | Gangrene associated with diabetes mellitus                            |
| Diabetes | 616451000006110   | Diabetes mellitus with polyneuropathy                                 |
| Diabetes | 292582011         | Type II diabetes mellitus with gangrene                               |
| Diabetes | 356085010         | Maturity onset diabetes in youth type 2                               |
| Diabetes | 264716012         | Diabetic - poor control NOS   |
| Diabetes | 2920971000006110  | Diabetic acidosis with coma   |
| Diabetes | 6983521000006110  | Diabetic neurologic disease   |
| Diabetes | 84741000006118    | Type I diabetes mellitus with nephropathy                             |
| Diabetes | 2159979014        | Maculopathy of right eye with diabetes mellitus                       |
| Diabetes | 2674067015        | Latent autoimmune diabetes mellitus in adult                          |
| Diabetes | 12363731000000000 | Polyneuropathy co-occurrent and due to type 2 diabetes mellitus       |
| Diabetes | 1667921000000110  | Type II diabetes mellitus with gastroparesis                          |
| Diabetes | 6837991000006110  | Diabetes mellitus caused by non-steroid drugs without complication    |
| Diabetes | 494831000000119   | Diabetes mellitus associated with cystic fibrosis                     |
| Diabetes | 914151000006112   | Retinopathy with type 2 diabetes mellitus                             |
| Diabetes | 299211000000114   | Insulin needles changed for each injection                            |
| Diabetes | 914271000006114   | Type II diabetes mellitus with nephropathy                            |
| Diabetes | 2168881000000110  | Subcutaneous infusion with insulin pump                               |
| Diabetes | 7500361000006110  | RCAD (renal cysts and diabetes) syndrome                              |
| Diabetes | 479571000000110   | Diabetes type 2 review  |
| Diabetes | 771351000006111   | Insulin dependent diabetes mellitus with gangrene                     |
| Diabetes | 459161015         | Type 1 diabetes mellitus with hypoglycaemic coma                      |
| Diabetes | 6951081000006110  | Ketoacidosis in type I diabetes mellitus                              |
| Diabetes | 1785163015        | High risk proliferative diabetic retinopathy                          |
| Diabetes | 12334141000000000 | Neurological disorder with diabetes type 2                            |

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| Diabetes | 455408014         | Advanced diabetic retinal disease                                  |
| Diabetes | 84341000006119    | Type 1 diabetes mellitus with hypoglycaemic coma                   |
| Diabetes | 459312014         | Type II diabetes mellitus with neuropathic arthropathy             |
| Diabetes | 283584016         | Non-urgent diabetic admission                                      |
| Diabetes | 12180761000000000 | DLRPN - diabetic lumbosacral radiculoplexus neuropathy             |
| Diabetes | 292543014         | Type I diabetes mellitus with gangrene                             |
| Diabetes | 84971000006111    | Type II diabetes mellitus with polyneuropathy                      |
| Diabetes | 2288071000000110  | Type 2 diabetes mellitus in remission                              |
| Diabetes | 299191000000110   | Insulin needles changed daily                                      |
| Diabetes | 2683561000006110  | Brittle diabetes mellitus  |
| Diabetes | 280551000006114   | Non-insulin-dependent diabetes mellitus with ulcer                 |
| Diabetes | 3253231000006110  | Diabetes mellitus type I   |
| Diabetes | 84571000006115    | Type 2 diabetes mellitus with neuropathic arthropathy              |
| Diabetes | 264706016         | Conversion to insulin  |
| Diabetes | 306112011         | Pre-existing diabetes mellitus, insulin-dependent                  |
| Diabetes | 280561000006111   | Non-insulin-dependent diabetes mellitus with peripheral angiopathy |
| Diabetes | 787101000006114   | IDDM with peripheral circulatory disorder                          |
| Diabetes | 928541000006117   | Persistent proteinuria associated with type 2 diabetes mellitus    |
| Diabetes | 914251000006116   | Type II diabetes mellitus with polyneuropathy                      |
| Diabetes | 12704951000000000 | Diabetic retinopathy associated with type 1 diabetes mellitus      |
| Diabetes | 12220651000000000 | Mononeuritis multiplex with diabetes mellitus                      |
| Diabetes | 479511000000117   | Diabetes type 1 review   |
| Diabetes | 12166111000000000 | Retinopathy due to diabetes mellitus                               |
| Diabetes | 881461000006110   | Diabetes+ketoacidosis -no coma                                     |
| Diabetes | 292541011         | Type 1 diabetes mellitus with gangrene                             |
| Diabetes | 84691000006115    | Cataract due to diabetes mellitus type 1                           |
| Diabetes | 6953871000006110  | Ketoacidosis in diabetes mellitus                                  |
| Diabetes | 84421000006115    | Type 1 diabetes mellitus with polyneuropathy                       |
| Diabetes | 84731000006111    | Multiple complications of type 1 diabetes mellitus                 |
| Diabetes | 4392141000006110  | Lipoatrophic diabetes  |
| Diabetes | 457157017         | [V]Admitted for commencement of insulin                            |
| Diabetes | 5981421000006110  | Insulin injection  |
| Diabetes | 6763751000006110  | Diabetes mellitus caused by non-steroid drugs                      |
| Diabetes | 12702421000000000 | Type II diabetes mellitus with ophthalmic complications            |
| Diabetes | 198461000000116   | Diabetes mellitus associated with pancreatic disease               |
| Diabetes | 928521000006112   | Ketoacidotic coma in type 1 diabetes mellitus                      |
| Diabetes | 616831000006118   | Diabetes with gangrene   |
| Diabetes | 772141000006118   | Insulin dependent diab mell with peripheral angiopathy             |
| Diabetes | 772151000006116   | Insulin dependent diabetes maturity onset                          |
| Diabetes | 772181000006112   | Insulin dependent diabetes mellitus - poor control                 |
| Diabetes | 913511000006117   | Type 1 diabetes mellitus with neurological complications           |
| Diabetes | 913551000006116   | Type I diabetes mellitus with multiple complications               |
| Diabetes | 2900941000006110  | Ophthalmic manifestations of diabetes                              |
| Diabetes | 12363661000000000 | Gastroparesis with type 1 diabetes mellitus                        |
| Diabetes | 764201000006110   | Foot abnormality - diabetes related                                |



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| Diabetes | 84431000006117    | Type 1 diabetes mellitus with renal complications  |
| Diabetes | 12336531000000000 | Retinopathy with type 2 diabetes mellitus  |
| Diabetes | 1488394019        | O/E - Right diabetic foot at high risk   |
| Diabetes | 5754621000006110  | Labile type I diabetes mellitus  |
| Diabetes | 616551000006111   | Diabetes mellitus, adult onset, with renal manifestation   |
| Diabetes | 4542241000006110  | History of insulin therapy   |
| Diabetes | 12363721000000000 | Polyneuropathy co-occurrent and due to type 1 diabetes mellitus  |
| Diabetes | 5505651000006110  | Diabetes mellitus uncontrolled   |
| Diabetes | 881481000006117   | Diabetes + nephropathy   |
| Diabetes | 616601000006113   | Diabetes mellitus, juvenile type, + ophthalmic manifestation   |
| Diabetes | 292480018         | Diabetes mellitus with hyperosmolar coma   |
| Diabetes | 646031000000112   | Insulin treatment initiated  |
| Diabetes | 282570016         | Diabetic stabilisation   |
| Diabetes | 458512016         | Diabetic on insulin and oral treatment   |
| Diabetes | 914221000006113   | Type 2 diabetes mellitus with mononeuropathy   |
| Diabetes | 6965561000006110  | Ketoacidotic coma in type I diabetes mellitus  |
| Diabetes | 938301000006114   | Exudative maculopathy with type 1 diabetes mellitus  |
| Diabetes | 2500921000000110  | Diabetic carbohydrate counting diet  |
| Diabetes | 928531000006110   | Type I diabetes mellitus with ketoacidotic coma  |
| Diabetes | 303847013         | Kimmelstiel - Wilson disease   |
| Diabetes | 841351000006110   | Insulin treated Type II diabetes mellitus  |
| Diabetes | 914311000006114   | Type II diabetes mellitus with diabetic cataract   |
| Diabetes | 292475010         | Diabetes mellitus NOS with no mention of complication  |
| Diabetes | 6983511000006110  | Neurologic complication of diabetes mellitus   |
| Diabetes | 6977971000006110  | Exudative maculopathy associated with type II diabetes mellitus  |
| Diabetes | 1658901000000110  | Type II diabetic dietary review  |
| Diabetes | 309737011         | Diabetic cheiroarthropathy   |
| Diabetes | 292538019         | Type I diabetes mellitus with ulcer  |
| Diabetes | 913941000006114   | Peripheral angiopathy due to type 1 diabetes mellitus  |
| Diabetes | 913931000006116   | Type 1 diabetes mellitus with peripheral angiopathy  |
| Diabetes | 616621000006115   | Type 1 diabetes mellitus without complication  |
| Diabetes | 281211000006117   | Gangrene associated with type 2 diabetes mellitus  |
| Diabetes | 928491000006110   | Type I diabetes mellitus with persistent microalbuminuria<br>On examination - right eye stable treated proliferative diabetic<br>retinopathy |
| Diabetes | 6866901000006110  | Multiple complications of type I diabetes mellitus   |
| Diabetes | 6761861000006110  | On examination - right eye proliferative diabetic retinopathy  |
| Diabetes | 292483016         | Diabetes mellitus, adult onset, with hyperosmolar coma   |
| Diabetes | 913811000006115   | Type 1 diabetes mellitus with polyneuropathy   |
| Diabetes | 5109611000006110  | MODY - Maturity onset diabetes in youth type 2   |
| Diabetes | 281161000006114   | Non-insulin depend diabetes mellitus with diabetic cataract  |
| Diabetes | 280521000006117   | Non-insulin dependent diabetes mellitus with mononeuropathy  |
| Diabetes | 6515451000006110  | On examination - diabetic maculopathy present both eyes  |
| Diabetes | 914301000006111   | Type 2 diabetes mellitus with diabetic cataract  |
| Diabetes | 913541000006118   | Type 1 diabetes mellitus with multiple complications   |

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| Diabetes | 881511000006113   | Diabetes + periph.circulat.dis   |
| Diabetes | 913461000006115   | Type I diabetes mellitus with renal complications  |
| Diabetes | 1785332013        | Background diabetic retinopathy  |
| Diabetes | 12762301000000000 | Diabetic oculopathy associated with type 2 diabetes mellitus   |
| Diabetes | 616671000006119   | Diabetes mellitus, juvenile, + neurological manifestation  |
| Diabetes | 12185421000000000 | Polyneuropathy due to diabetes mellitus  |
| Diabetes | 264681018         | Diabetic on oral treatment   |
| Diabetes | 913911000006110   | Type I diabetes mellitus with diabetic cataract  |
| Diabetes | 616381000006111   | Diabetes mellitus with ketoacidotic coma   |
| Diabetes | 452078013         | Subcutaneous injection of insulin  |
| Diabetes | 280511000006113   | Non-insulin dependent diabetes mellitus with hypoglyca coma  |
| Diabetes | 292488013         | Coma associated with diabetes mellitus   |
| Diabetes | 913491000006111   | Type I diabetes mellitus with ophthalmic complications   |
| Diabetes | 84541000006111    | Type 2 diabetes mellitus with multiple complications   |
| Diabetes | 72651000006114    | Unstable insulin dependent diabetes mellitus   |
| Diabetes | 6763741000006110  | DM caused by non-steroid drug  |
| Diabetes | 2683591000006110  | Unstable diabetes mellitus   |
| Diabetes | 292617015         | Diabetes mellitus with other specified manifestation   |
| Diabetes | 278718015         | Continuous subcutaneous infusion of insulin  |
| Diabetes | 280571000006116   | Non-insulin dependent diabetes mellitus  |
| Diabetes | 7287621000006110  | Type I diabetes mellitus uncontrolled  |
| Diabetes | 3128741000006110  | Diabetic lumbosacral radiculoplexus neuropathy   |
| Diabetes | 616491000006116   | Diabetes mellitus, adult onset, + ophthalmic manifestation   |
| Diabetes | 6050071000006110  | Insulin dependent diabetes mellitus with hypoglycemic coma   |
| Diabetes | 308360012         | Cellulitis in diabetic foot  |
| Diabetes | 205225016         | Diabetic nephropathy   |
| Diabetes | 1484887015        | O/E - diabetic maculopathy present both eyes   |
| Diabetes | 306113018         | Pre-existing diabetes mellitus, non-insulin-dependent  |
| Diabetes | 1488441010        | Diabetes medication review   |
| Diabetes | 938311000006112   | Type I diabetes mellitus with exudative maculopathy  |
| Diabetes | 616241000006112   | Diabetes mellitus induced by steroids  |
| Diabetes | 12086321000000000 | Maculopathy of left eye due to diabetes mellitus   |
| Diabetes | 2359401000000110  | Conversion to non-insulin injectable medication  |
| Diabetes | 1966321000006110  | Diabetic on insulin and glucagon-like peptide 1 receptor agonist   |
| Diabetes | 251892015         | H/O: insulin therapy   |
| Diabetes | 914051000006113   | Disorder of eye with type 2 diabetes mellitus  |
| Diabetes | 2243331000000110  | Erectile dysfunction due to diabetes mellitus<br>Lumbosacral radiculoplexus neuropathy co-occurrent and due to diabetes mellitus |
| Diabetes | 12180781000000000 |  |
| Diabetes | 6955501000006110  | Persistent proteinuria associated with type I diabetes mellitus  |
| Diabetes | 2115761000000110  | Diabetes self-management plan review   |
| Diabetes | 914161000006114   | Type II diabetes mellitus with retinopathy   |
| Diabetes | 2532977011        | O/E - right chronic diabetic foot ulcer  |
| Diabetes | 292540012         | Type 1 diabetes mellitus with ulcer  |
| Diabetes | 297551015         | Chronic painful diabetic neuropathy  |

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| Diabetes | 72711000006117    | Unstable type 1 diabetes mellitus  |
| Diabetes | 457327017         | Insulin-dependent diabetes without complication                          |
| Diabetes | 6985001000006110  | Peripheral circulatory disorder associated with type 2 diabetes mellitus |
| Diabetes | 12704941000000000 | Neurological disorder associated with type 1 diabetes mellitus           |
| Diabetes | 280581000006118   | Non-insulin-dependent diabetes mellitus with multiple complications      |
| Diabetes | 12086341000000000 | Disorder of left macula co-occurrent and due to diabetes mellitus        |
| Diabetes | 6961091000006110  | Gangrene associated with type I diabetes mellitus                        |
| Diabetes | 4392221000006110  | Peripheral angiopathy due to diabetes mellitus                           |
| Diabetes | 4758011000006110  | Type 2 diabetes mellitus with hyperosmolar coma                          |
| Diabetes | 12332761000000000 | Mononeuropathy co-occurrent and due to type 1 diabetes mellitus          |
| Diabetes | 6761781000006110  | On examination - right eye background diabetic retinopathy               |
| Diabetes | 764191000006112   | Foot abnormality - diabetes related                                      |
| Diabetes | 459293018         | Insulin dependent diabetes mellitus with arthropathy                     |
| Diabetes | 6761801000006110  | On examination - left eye background diabetic retinopathy                |
| Diabetes | 12334131000000000 | Neurological disorder co-occurrent and due to type 2 diabetes mellitus   |
| Diabetes | 1488405010        | Diabetic foot risk assessment  |
| Diabetes | 459162010         | Insulin dependent diabetes mellitus with hypoglycaemic coma              |
| Diabetes | 616511000006110   | Diabetes mellitus, adult onset, no mention of complication               |
| Diabetes | 6980441000006110  | Diabetes type 1 with cataract  |
| Diabetes | 459163017         | Type I diabetes mellitus with hypoglycaemic coma                         |
| Diabetes | 292503016         | Diabetes mellitus NOS with ophthalmic manifestation                      |
| Diabetes | 2159974016        | O/E - left eye background diabetic retinopathy                           |
| Diabetes | 2920981000006110  | Diabetic coma  |
| Diabetes | 6975221000006110  | Gangrene associated with type II diabetes mellitus                       |
| Diabetes | 84621000006117    | Type 2 diabetes mellitus with retinopathy                                |
| Diabetes | 12218511000000000 | Kidney disorder due to diabetes mellitus                                 |
| Diabetes | 840951000006119   | Insulin treated Type 2 diabetes mellitus                                 |
| Diabetes | 292621010         | Diabetes mellitus NOS with other specified manifestation                 |
| Diabetes | 746791000006111   | Insulin-dependent diabetes without complication                          |
| Diabetes | 12086281000000000 | Diabetic maculopathy of right eye  |
| Diabetes | 85011000006119    | Type II diabetes mellitus without complication                           |
| Diabetes | 5109581000006110  | Maturity onset diabetes in youth type II                                 |
| Diabetes | 616581000006115   | Diabetes mellitus, adult, + peripheral circulatory disorder              |
| Diabetes | 7287611000006110  | Type 1 diabetes mellitus uncontrolled                                    |
| Diabetes | 616541000006114   | Diabetes mellitus, adult onset, with ketoacidotic coma                   |
| Diabetes | 12086291000000000 | Maculopathy of right eye due to diabetes mellitus                        |
| Diabetes | 913801000006118   | Insulin dependent diabetes mellitus with polyneuropathy                  |
| Diabetes | 84301000006116    | Type 1 diabetes mellitus maturity onset                                  |
| Diabetes | 3253241000006110  | Diabetes mellitus type 1   |
| Diabetes | 3537388019        | Diabetic oculopathy due to type 1 diabetes mellitus                      |
| Diabetes | 84681000006118    | Type I diabetes mellitus with arthropathy                                |
| Diabetes | 6985411000006110  | Diabetic skin ulcer  |
| Diabetes | 264720011         | Date diabetic treatment start  |
| Diabetes | 913891000006113   | Insulin dependent diabetes mellitus with diabetic cataract               |
| Diabetes | 84771000006114    | Disorder of eye with type 1 diabetes mellitus                            |

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| Diabetes | 214921000006116   | Polyneuropathy in diabetes   |
| Diabetes | 5109591000006110  | MODY - Maturity onset diabetes in youth type II                      |
| Diabetes | 12180791000000000 | Diabetic lumbosacral plexopathy                                      |
| Diabetes | 12185431000000000 | Polyneuropathy co-occurrent and due to diabetes mellitus             |
| Diabetes | 587111000006111   | Non-insulin-dependent diabetes mellitus with ophthalm comps          |
| Diabetes | 84411000006111    | Type 1 diabetes mellitus with peripheral angiopathy                  |
| Diabetes | 281181000006116   | Non-insulin dependent diabetes mellitus with neuropathic arthropathy |
| Diabetes | 299601000000114   | Gastroparesis with type 1 diabetes mellitus                          |
| Diabetes | 2683581000006110  | Labile diabetes  |
| Diabetes | 6866781000006110  | On examination - right chronic diabetic foot ulcer                   |
| Diabetes | 3319861000006110  | Diabetic autonomic neuropathy  |
| Diabetes | 84441000006110    | Type 1 diabetes mellitus with retinopathy                            |
| Diabetes | 913531000006111   | Insulin dependent diabetes mellitus with multiple complicat          |
| Diabetes | 913451000006117   | Type 1 diabetes mellitus with renal complications                    |
| Diabetes | 913621000006112   | Insulin dependent diabetes mellitus with gangrene                    |
| Diabetes | 913851000006119   | Type I diabetes mellitus with nephropathy                            |
| Diabetes | 127051000006112   | Steroid-induced diabetes mellitus without complication               |
| Diabetes | 772171000006114   | Insulin dependent diabetes mellitus                                  |
| Diabetes | 3209441000006110  | Diabetes mellitus type 2   |
| Diabetes | 6980001000006110  | Kidney disorder associated with type 1 diabetes mellitus             |
| Diabetes | 616681000006116   | Diabetes mellitus, juvenile, + other specified manifestation         |
| Diabetes | 4392181000006110  | Renal disorder associated with diabetes mellitus                     |
| Diabetes | 12220671000000000 | Asymptomatic neuropathy with diabetes mellitus                       |
| Diabetes | 6980431000006110  | Diabetic cataract associated with type I diabetes mellitus           |
| Diabetes | 2476117016        | Maturity onset diabetes in youth type 1                              |
| Diabetes | 12336121000000000 | Cataract co-occurrent and due to diabetes mellitus type 1            |
| Diabetes | 6910411000006110  | On examination - sight threatening diabetic retinopathy              |
| Diabetes | 84841000006113    | Type II diabetes mellitus  |
| Diabetes | 2159976019        | O/E - left eye preproliferative diabetic retinopathy                 |
| Diabetes | 8014491000006110  | Peripheral vascular disease due to type I diabetes                   |
| Diabetes | 12702361000000000 | Diabetic cataract associated with type 1 diabetes mellitus           |
| Diabetes | 84661000006111    | Type I diabetes mellitus poorly controlled                           |
| Diabetes | 12336881000000000 | Disorder of eye co-occurrent and due to type 2 diabetes mellitus     |
| Diabetes | 84381000006113    | Type 1 diabetes mellitus with neurological complications             |
| Diabetes | 8343301000006110  | DPNP - diabetic peripheral neuropathic pain                          |
| Diabetes | 12166101000000000 | Retinopathy co-occurrent and due to diabetes mellitus                |
| Diabetes | 358036010         | Insulin site lipohypertrophy   |
| Diabetes | 84981000006114    | Type II diabetes mellitus with renal complications                   |
| Diabetes | 6964251000006110  | Coma associated with malnutrition-related diabetes mellitus          |
| Diabetes | 5990991000006110  | History of admission in last year for diabetes foot problem          |
| Diabetes | 2548271013        | Agreeing on diabetes care plan                                       |
| Diabetes | 292622015         | Diabetes mellitus with unspecified complication                      |
| Diabetes | 2920961000006110  | Diabetic coma with ketoacidosis                                      |
| Diabetes | 1734721000000110  | Assessment of diabetic erectile dysfunction                          |
| Diabetes | 6546411000006110  | On examination - Left diabetic foot at moderate risk                 |

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| Diabetes | 6546301000006110  | On examination - Left diabetic foot - ulcerated                             |
| Diabetes | 12221151000000000 | Mononeuropathy co-occurrent and due to diabetes mellitus                    |
| Diabetes | 292551012         | Type I diabetes mellitus maturity onset                                     |
| Diabetes | 928501000006119   | Ketoacidosis in type 1 diabetes mellitus                                    |
| Diabetes | 641581000006115   | Non-insulin-dependent diabetes mellitus with retinopathy                    |
| Diabetes | 6953891000006110  | Diabetic acidosis   |
| Diabetes | 938321000006116   | Exudative maculopathy associated with type 2 diabetes mellitus              |
| Diabetes | 771401000006115   | Insulin dependent diabetes mellitus with polyneuropathy                     |
| Diabetes | 459309011         | Non-insulin dependent diabetes mellitus with arthropathy                    |
| Diabetes | 6050061000006110  | Type I diabetes mellitus with hypoglycemic coma                             |
| Diabetes | 616921000006113   | Diabetic amyotrophy   |
| Diabetes | 771391000006117   | Insulin dependent diabetes mellitus with nephropathy                        |
| Diabetes | 459313016         | Type 2 diabetes mellitus with neuropathic arthropathy                       |
| Diabetes | 6951091000006110  | Diabetes type 1 with ketoacidosis   |
| Diabetes | 2159975015        | O/E - right eye preproliferative diabetic retinopathy                       |
| Diabetes | 840971000006112   | Diabetes mellitus autosomal dominant type II                                |
| Diabetes | 12363681000000000 | Gastroparesis with type 2 diabetes mellitus                                 |
| Diabetes | 6866541000006110  | On examination - left eye stable treated proliferative diabetic retinopathy |
| Diabetes | 914071000006115   | Neurologic disorder associated with type 2 diabetes mellitus                |
| Diabetes | 6961901000006110  | Disorder associated with type I diabetes mellitus                           |
| Diabetes | 913661000006118   | Retinopathy with type 1 diabetes mellitus                                   |
| Diabetes | 2159949019        | Diabetic retinopathy 6 month review   |
| Diabetes | 292583018         | Type 2 diabetes mellitus with gangrene                                      |
| Diabetes | 4788421000006110  | Nephrotic syndrome due to diabetes mellitus                                 |
| Diabetes | 5975321000006110  | On examination - Left diabetic foot at risk                                 |
| Diabetes | 4796321000006110  | Pre-existing type 2 diabetes mellitus                                       |
| Diabetes | 264717015         | Diabetic - cooperative patient  |
| Diabetes | 928561000006118   | Persistent microalbuminuria associated with type 2 diabetes mellitus        |
| Diabetes | 6960441000006110  | Diabetes type 1 with retinopathy  |
| Diabetes | 7500351000006110  | Renal cysts and diabetes syndrome   |
| Diabetes | 292466013         | Diabetes mellitus without complication                                      |
| Diabetes | 6959811000006110  | Diabetes type 2 with cataract   |
| Diabetes | 6022721000006110  | Proliferative diabetic retinopathy - high risk                              |
| Diabetes | 6965571000006110  | Diabetes mellitus type 1 with ketoacidotic coma                             |
| Diabetes | 483882011         | Maturity-onset diabetes of the young  |
| Diabetes | 771481000006112   | Insulin-dependent diabetes mellitus with neurological comps                 |
| Diabetes | 2117891000000110  | Diabetes self-management plan agreed  |
| Diabetes | 2159973010        | O/E - right eye background diabetic retinopathy                             |
| Diabetes | 616461000006112   | Diabetes mellitus with renal manifestation                                  |
| Diabetes | 6970621000006110  | Peripheral circulatory disorder associated with type 1 diabetes mellitus    |
| Diabetes | 84951000006118    | Disorder of eye with type 2 diabetes mellitus                               |
| Diabetes | 5110071000006110  | Hypoglycaemic event in diabetes   |
| Diabetes | 5109631000006110  | MODY2   |
| Diabetes | 6983691000006110  | Diabetic oculopathy associated with type II diabetes mellitus               |
| Diabetes | 616571000006118   | Diabetes mellitus, adult, + other specified manifestation                   |

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| Diabetes | 719601000006110   | Malnutrition-related diabetes mellitus with peripheral circulatory complications |
| Diabetes | 12220681000000000 | Proliferative retinopathy co-occurrent and due to diabetes mellitus              |
| Diabetes | 354508018         | Clinical diabetic nephropathy  |
| Diabetes | 5109561000006110  | Maturity onset diabetes of the young, type 2                                     |
| Diabetes | 8084961000006110  | Diabetes type II review  |
| Diabetes | 719531000006118   | Malnutrition related diabetes mellitus   |
| Diabetes | 84611000006113    | Type 2 diabetes mellitus with renal complications                                |
| Diabetes | 12704391000000000 | Neurologic disorder associated with diabetes mellitus                            |
| Diabetes | 6546321000006110  | On examination - Left diabetic foot at low risk                                  |
| Diabetes | 84331000006112    | Type 1 diabetes mellitus with gangrene   |
| Diabetes | 457328010         | Non-insulin-dependent diabetes mellitus without complication                     |
| Diabetes | 84861000006112    | Type II diabetes mellitus with arthropathy                                       |
| Diabetes | 2474334019        | Diabetes clinical management plan  |
| Diabetes | 309738018         | Diabetic cheirography  |
| Diabetes | 913441000006119   | Insulin-dependent diabetes mellitus with renal complications                     |
| Diabetes | 12336851000000000 | Nervous system disorder due to diabetes mellitus                                 |
| Diabetes | 297550019         | Acute painful diabetic neuropathy  |
| Diabetes | 11927561000000000 | Hypoglycemic coma co-occurrent and due to diabetes mellitus type II              |
| Diabetes | 3963931000006110  | Iatrogenic hyperinsulinemia  |
| Diabetes | 616081000006113   | Diabetes mellitus insulin-glucose infusion in acute myocardial infarction        |
| Diabetes | 306114012         | Pre-existing malnutrition-related diabetes mellitus                              |
| Diabetes | 84401000006113    | Type 1 diabetes mellitus with ophthalmic complications                           |
| Diabetes | 308110013         | Pre-existing diabetes mellitus   |
| Diabetes | 12224591000000000 | Advanced retinal disease with diabetes mellitus                                  |
| Diabetes | 84361000006115    | Type 1 diabetes mellitus with multiple complications                             |
| Diabetes | 12221261000000000 | Maculopathy with diabetes mellitus   |
| Diabetes | 5109461000006110  | Diabetes type 2 on insulin   |
| Diabetes | 3209431000006110  | Diabetes mellitus type II  |
| Diabetes | 1666931000000110  | O/E - Right diabetic foot at increased risk                                      |
| Diabetes | 12482051000000000 | Admit diabetic emergency   |
| Diabetes | 6618061000006110  | Bronze diabetes  |
| Diabetes | 881441000006111   | Diabetes mellitus - juvenile   |
| Diabetes | 12370281000000000 | Disorder of eye co-occurrent and due to type 1 diabetes mellitus                 |
| Diabetes | 12370271000000000 | Disorder of eye with type 1 diabetes mellitus                                    |
| Diabetes | 2460251000000110  | Diabetic on non-insulin injectable medication                                    |
| Diabetes | 5754611000006110  | Brittle type I diabetes mellitus   |
| Diabetes | 292576013         | Type II diabetes mellitus with multiple complications                            |
| Diabetes | 7500201000006110  | MODY1  |
| Diabetes | 12336111000000000 | Cataract due to diabetes mellitus type 1   |
| Diabetes | 12335991000000000 | Peripheral vascular disorder due to diabetes mellitus                            |
| Diabetes | 12189881000000000 | Proliferative retinopathy with diabetes mellitus                                 |
| Diabetes | 12332281000000000 | Retinopathy co-occurrent and due to type 1 diabetes mellitus                     |
| Diabetes | 7708121000006110  | Polyneuropathy due to diabetes mellitus type II                                  |
| Diabetes | 12331051000000000 | Mononeuropathy with type 2 diabetes mellitus                                     |

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| Diabetes | 6030001000006110  | Insulin-dependent diabetes without complication                        |
| Diabetes | 293756010         | [X]Other specified diabetes mellitus                                   |
| Diabetes | 1230929011        | Secondary pancreatic diabetes mellitus                                 |
| Diabetes | 292577016         | Type 2 diabetes mellitus with multiple complications                   |
| Diabetes | 12220701000000000 | Advanced maculopathy with diabetes mellitus                            |
| Diabetes | 2622193012        | Diabetes mellitus with ketoacidosis                                    |
| Diabetes | 5754581000006110  | Brittle type 1 diabetes mellitus                                       |
| Diabetes | 771501000006119   | Insulin-dependent diabetes mellitus with renal complications           |
| Diabetes | 12189901000000000 | Proliferative retinopathy co-occurrent and due to diabetes mellitus    |
| Diabetes | 12189891000000000 | PDR - proliferative diabetic retinopathy                               |
| Diabetes | 2287971000000110  | Diabetes mellitus in remission   |
| Diabetes | 84851000006110    | Type II diabetes mellitus - poor control                               |
| Diabetes | 12705071000000000 | Gastroparesis due to type 1 diabetes mellitus                          |
| Diabetes | 459310018         | Type 2 diabetes mellitus with arthropathy                              |
| Diabetes | 587521000006111   | Non-insulin-dependent diabetes mellitus with renal comps               |
| Diabetes | 914061000006110   | Type II diabetes mellitus with ophthalmic complications                |
| Diabetes | 399419012         | Myasthenic syndrome due to diabetic amyotrophy                         |
| Diabetes | 4758061000006110  | Insulin-dependent diabetes mellitus with ulcer                         |
| Diabetes | 6960431000006110  | Diabetic retinopathy associated with type I diabetes mellitus          |
| Diabetes | 12220721000000000 | Iritis due to diabetes mellitus  |
| Diabetes | 1488403015        | O/E - Left diabetic foot at moderate risk                              |
| Diabetes | 616441000006113   | Peripheral vascular disorder due to diabetes mellitus                  |
| Diabetes | 459169018         | Hypoglycaemic coma co-occurrent and due to diabetes mellitus type II   |
| Diabetes | 84641000006112    | Type 2 diabetes mellitus without complication                          |
| Diabetes | 84311000006118    | Type 1 diabetes mellitus with arthropathy                              |
| Diabetes | 913501000006115   | Insulin-dependent diabetes mellitus with neurological comps            |
| Diabetes | 1968641000006110  | Maturity-onset diabetes of the young, type 5                           |
| Diabetes | 457326014         | Type 1 diabetes mellitus without complication                          |
| Diabetes | 771421000006113   | Insulin dependent diabetes mellitus with ulcer                         |
| Diabetes | 84291000006117    | Type 1 diabetes mellitus - poor control                                |
| Diabetes | 347657010         | Diabetic maculopathy   |
| Diabetes | 12218501000000000 | Disorder of kidney co-occurrent and due to diabetes mellitus           |
| Diabetes | 881491000006119   | Diabetes + eye manifestation   |
| Diabetes | 12221241000000000 | Disorder of macula co-occurrent and due to diabetes mellitus           |
| Diabetes | 12704971000000000 | Neurologic disorder associated with type 2 diabetes mellitus           |
| Diabetes | 4807571000006110  | Ischemic ulcer diabetic foot   |
| Diabetes | 12705011000000000 | Exudative maculopathy associated with type 2 diabetes mellitus         |
| Diabetes | 472901000000116   | Insulin dose changed   |
| Diabetes | 12335681000000000 | Exudative maculopathy co-occurrent and due to type 2 diabetes mellitus |
| Diabetes | 264705017         | Diabetic treatment changed   |
| Diabetes | 6982521000006110  | Diabetes type 2 with retinopathy                                       |
| Diabetes | 1780386019        | Diabetic foot examination  |
| Diabetes | 4392201000006110  | Diabetic peripheral vascular disease                                   |
| Diabetes | 6962751000006110  | Mononeuropathy associated with type I diabetes mellitus                |
| Diabetes | 84451000006112    | Type 1 diabetes mellitus with ulcer                                    |

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| Diabetes             | 12704411000000000 | Peripheral circulatory disorder associated with diabetes mellitus      |
| Diabetes             | 975261000006113   | O/E - left eye stable treated proliferative diabetic retinopathy       |
| Diabetes             | 3690681000006110  | DM - Diabetes mellitus   |
| Diabetes             | 459296014         | Type 1 diabetes mellitus with neuropathic arthropathy                  |
| Diabetes             | 6761881000006110  | On examination - left eye proliferative diabetic retinopathy           |
| Diabetes             | 1667941000000110  | Type I diabetes mellitus with gastroparesis                            |
| Diabetes             | 7500341000006110  | MODY5 - maturity-onset diabetes of the young type 5                    |
| Diabetes             | 938331000006118   | Exudative maculopathy with type 2 diabetes mellitus                    |
| Diabetes             | 2287311000000110  | Diabetes Year of Care annual review                                    |
| Diabetes             | 12331221000000000 | Exudative maculopathy with type 1 diabetes mellitus                    |
| Diabetes             | 2900951000006110  | Diabetic eye disease   |
| Diabetes             | 429971019         | Unstable type 1 diabetes mellitus                                      |
| Diabetes             | 12331231000000000 | Exudative maculopathy co-occurrent and due to type 1 diabetes mellitus |
| Diabetes             | 354509014         | Proteinuric diabetic nephropathy                                       |
| Diabetes             | 292579018         | Type 2 diabetes mellitus with ulcer                                    |
| Diabetes             | 4392151000006110  | Lipodystrophic diabetes  |
| Diabetes             | 84491000006118    | Type 2 diabetes mellitus with arthropathy                              |
| Diabetes             | 913651000006115   | Insulin dependent diabetes mellitus with retinopathy                   |
| Diabetes             | 6763731000006110  | DM induced by non-steroid drug   |
| Diabetes             | 6977431000006110  | Diabetes type 2 with ketoacidosis                                      |
| Diabetic Retinopathy | 6515171000006110  | Nonproliferative diabetic retinopathy                                  |
| Diabetic Retinopathy | 6022611000006110  | Mild nonproliferative diabetic retinopathy                             |
| Diabetic Retinopathy | 913661000006118   | Retinopathy with type 1 diabetes mellitus                              |
| Diabetic Retinopathy | 856611000006114   | Laser treated diabetic retinopathy                                     |
| Diabetic Retinopathy | 913651000006115   | Insulin dependent diabetes mellitus with retinopathy                   |
| Diabetic Retinopathy | 6022581000006110  | Mild non-proliferative diabetic retinopathy                            |
| Diabetic Retinopathy | 12085171000000000 | Moderate nonproliferative diabetic retinopathy of right eye            |
| Diabetic Retinopathy | 6022671000006110  | Proliferative diabetic retinopathy - non high risk                     |
| Diabetic Retinopathy | 12086331000000000 | Diabetic maculopathy of left eye                                       |
| Diabetic Retinopathy | 856621000006118   | Left proliferative diabetic retinopathy                                |
| Diabetic Retinopathy | 857051000006118   | Left preproliferative diabetic retinopathy                             |
| Diabetic Retinopathy | 6761781000006110  | On examination - right eye background diabetic retinopathy             |
| Diabetic Retinopathy | 297754014         | Preproliferative diabetic retinopathy                                  |
| Diabetic Retinopathy | 2159949019        | Diabetic retinopathy 6 month review                                    |
| Diabetic Retinopathy | 975261000006113   | O/E - left eye stable treated proliferative diabetic retinopathy       |



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| Diabetic Retinopathy | 856641000006113   | Left diabetic maculopathy                                 |
| Diabetic Retinopathy | 9093013           | Diabetic retinopathy                                      |
| Diabetic Retinopathy | 2159976019        | O/E - left eye preproliferative diabetic retinopathy      |
| Diabetic Retinopathy | 771411000006117   | Insulin dependent diabetes mellitus with retinopathy      |
| Diabetic Retinopathy | 2159974016        | O/E - left eye background diabetic retinopathy            |
| Diabetic Retinopathy | 857421000006119   | Right laser treated diabetic retinopathy                  |
| Diabetic Retinopathy | 1484887015        | O/E - diabetic maculopathy present both eyes              |
| Diabetic Retinopathy | 857981000006113   | Right preproliferative diabetic retinopathy               |
| Diabetic Retinopathy | 12085021000000000 | Preproliferative diabetic retinopathy of right eye        |
| Diabetic Retinopathy | 1785332013        | Background diabetic retinopathy                           |
| Diabetic Retinopathy | 84621000006117    | Type 2 diabetes mellitus with retinopathy                 |
| Diabetic Retinopathy | 2159975015        | O/E - right eye preproliferative diabetic retinopathy     |
| Diabetic Retinopathy | 2159973010        | O/E - right eye background diabetic retinopathy           |
| Diabetic Retinopathy | 84991000006112    | Type II diabetes mellitus with retinopathy                |
| Diabetic Retinopathy | 2159977011        | O/E - right eye proliferative diabetic retinopathy        |
| Diabetic Retinopathy | 841011000006112   | Severe nonproliferative diabetic retinopathy              |
| Diabetic Retinopathy | 6022921000006110  | Diabetic macular oedema                                   |
| Diabetic Retinopathy | 169731000006118   | Retinal abnormality - diabetes-related                    |
| Diabetic Retinopathy | 6761801000006110  | On examination - left eye background diabetic retinopathy |
| Diabetic Retinopathy | 1484867016        | Non proliferative diabetic retinopathy                    |
| Diabetic Retinopathy | 12086281000000000 | Diabetic maculopathy of right eye                         |
| Diabetic Retinopathy | 347657010         | Diabetic maculopathy                                      |
| Diabetic Retinopathy | 84441000006110    | Type 1 diabetes mellitus with retinopathy                 |
| Diabetic Retinopathy | 857431000006116   | Right diabetic maculopathy                                |
| Diabetic Retinopathy | 12085051000000000 | Preproliferative diabetic retinopathy of left eye         |
| Diabetic Retinopathy | 733161000000116   | Impaired vision due to diabetic retinopathy               |

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| Diabetic Retinopathy | 2159978018        | O/E - left eye proliferative diabetic retinopathy                            |
| Diabetic Retinopathy | 914161000006114   | Type II diabetes mellitus with retinopathy                                   |
| Diabetic Retinopathy | 455408014         | Advanced diabetic retinal disease  |
| Diabetic Retinopathy | 12085721000000000 | Diabetic macular oedema of right eye   |
| Diabetic Retinopathy | 857031000006113   | Left non-proliferative diabetic retinopathy                                  |
| Diabetic Retinopathy | 857971000006110   | Right non-proliferative diabetic retinopathy                                 |
| Diabetic Retinopathy | 856631000006115   | Left laser treated diabetic retinopathy                                      |
| Diabetic Retinopathy | 6022621000006110  | Moderate nonproliferative diabetic retinopathy                               |
| Diabetic Retinopathy | 6866541000006110  | On examination - left eye stable treated proliferative diabetic retinopathy  |
| Diabetic Retinopathy | 7812121000006110  | Diabetic retinopathy of eye not detected                                     |
| Diabetic Retinopathy | 6041411000006110  | Ischaemic diabetic maculopathy   |
| Diabetic Retinopathy | 975251000006111   | O/E - right eye stable treated proliferative diabetic retinopathy            |
| Diabetic Retinopathy | 297758012         | Diabetic retinopathy NOS   |
| Diabetic Retinopathy | 7567371000006110  | Diabetic retinopathy clinic  |
| Diabetic Retinopathy | 641581000006115   | Non-insulin-dependent diabetes mellitus with retinopathy                     |
| Diabetic Retinopathy | 297755010         | Advanced diabetic maculopathy  |
| Diabetic Retinopathy | 12085121000000000 | Mild nonproliferative diabetic retinopathy of left eye                       |
| Diabetic Retinopathy | 914151000006112   | Retinopathy with type 2 diabetes mellitus                                    |
| Diabetic Retinopathy | 2576431000006110  | DR - Diabetic retinopathy  |
| Diabetic Retinopathy | 2159979014        | Maculopathy of right eye with diabetes mellitus                              |
| Diabetic Retinopathy | 2159980012        | Maculopathy of left eye with diabetes mellitus                               |
| Diabetic Retinopathy | 6515211000006110  | BDR - Background diabetic retinopathy  |
| Diabetic Retinopathy | 6866901000006110  | On examination - right eye stable treated proliferative diabetic retinopathy |
| Diabetic Retinopathy | 857411000006110   | Right proliferative diabetic retinopathy                                     |
| Diabetic Retinopathy | 98476015          | Proliferative diabetic retinopathy   |
| Diabetic Retinopathy | 12189891000000000 | PDR - proliferative diabetic retinopathy                                     |

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| Diabetic Retinopathy | 2549896013        | O/E - sight threatening diabetic retinopathy                 |
| Diabetic Retinopathy | 6630561000006110  | Diabetic macular oedema not clinically significant           |
| Diabetic Retinopathy | 913671000006113   | Type I diabetes mellitus with retinopathy                    |
| Diabetic Retinopathy | 1804191000006110  | Diabetic retinopathy screen done by optician                 |
| Diabetic Retinopathy | 12085761000000000 | Diabetic macular oedema of left eye                          |
| Diabetic Retinopathy | 12085181000000000 | Moderate non-proliferative diabetic retinopathy of right eye |
| Diabetic Retinopathy | 8286851000006110  | Education about diabetic retinopathy                         |
| Diabetic Retinopathy | 1785163015        | High risk proliferative diabetic retinopathy                 |
| Diabetic Retinopathy | 84811000006114    | Type I diabetes mellitus with retinopathy                    |
| Diabetic Retinopathy | 12224731000000000 | Moderate non-proliferative diabetic retinopathy              |
| Diabetic Retinopathy | 6022721000006110  | Proliferative diabetic retinopathy - high risk               |
| Endophthalmitis      | 7691221000006110  | Endophthalmitis caused by Acanthamoeba                       |
| Endophthalmitis      | 3602019           | Acute endophthalmitis  |
| Endophthalmitis      | 4166011           | Phacoanaphylactic endophthalmitis                            |
| Endophthalmitis      | 6879821000006110  | Sterile endophthalmitis                                      |
| Endophthalmitis      | 55709016          | Panophthalmitis  |
| Endophthalmitis      | 23828015          | Chronic endophthalmitis                                      |
| Endophthalmitis      | 6047201000006110  | Acute postoperative endophthalmitis                          |
| Endophthalmitis      | 6844301000006110  | Bacterial endophthalmitis                                    |
| Endophthalmitis      | 297668010         | Other endophthalmitis NOS                                    |
| Endophthalmitis      | 297661016         | Unspecified purulent endophthalmitis                         |
| Endophthalmitis      | 6890131000006110  | Cryptococcal endophthalmitis                                 |
| Endophthalmitis      | 6047221000006110  | Post-traumatic endophthalmitis                               |
| Endophthalmitis      | 297665013         | Purulent endophthalmitis NOS                                 |
| Endophthalmitis      | 6871631000006110  | P. acne endophthalmitis                                      |
| Endophthalmitis      | 6047191000006110  | Postoperative endophthalmitis                                |
| Endophthalmitis      | 6844831000006110  | Bleb related endophthalmitis                                 |
| Endophthalmitis      | 6798311000006110  | Postoperative endophthalmitis due to Propionibacterium acnes |
| Endophthalmitis      | 6882351000006110  | Toxocara endophthalmitis                                     |
| Endophthalmitis      | 6844821000006110  | Bleb associated endophthalmitis                              |
| Endophthalmitis      | 6845941000006110  | Candida endophthalmitis                                      |
| Endophthalmitis      | 69598013          | Purulent endophthalmitis                                     |
| Endophthalmitis      | 7691211000006110  | Acanthamoeba endophthalmitis                                 |
| Endophthalmitis      | 6798331000006110  | Postoperative sterile endophthalmitis                        |
| Endophthalmitis      | 8036271000006110  | History of endophthalmitis                                   |
| Endophthalmitis      | 6844841000006110  | Endophthalmitis associated with bleb                         |
| Endophthalmitis      | 6855661000006110  | Fungal endophthalmitis                                       |

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| Endophthalmitis | 6843631000006110 | Aspergillus endophthalmitis                                     |
| Endophthalmitis | 6798321000006110 | Postoperative endophthalmitis caused by Propionibacterium acnes |
| Endophthalmitis | 297666014        | Endophthalmitis   |
| Endophthalmitis | 299494016        | [X]Endophthalmitis in diseases classified elsewhere             |
| Endophthalmitis | 6047211000006110 | Chronic postoperative endophthalmitis                           |
| Endophthalmitis | 6047231000006110 | Endogenous endophthalmitis                                      |
| Endophthalmitis | 6871621000006110 | Propionibacterium acnes endophthalmitis                         |
| Endophthalmitis | 6859221000006110 | Infectious endophthalmitis                                      |
| Endophthalmitis | 297667017        | Parasitic endophthalmitis                                       |
| Endophthalmitis | 6798341000006110 | Postoperative infectious endophthalmitis                        |
| Eye Injury      | 6047051000006110 | Blunt injury of eye   |
| Eye Injury      | 321233015        | Penetrating wound of orbit without mention of foreign body      |
| Eye Injury      | 321241015        | Ocular laceration without intraocular prolapse                  |
| Eye Injury      | 36151015         | Superficial laceration of cornea                                |
| Eye Injury      | 321245012        | Laceration of eye   |
| Eye Injury      | 321235010        | Other open ocular adnexa wound                                  |
| Eye Injury      | 390561000006119  | Injury of globe of eye  |
| Eye Injury      | 104100012        | Superficial injury of cornea                                    |
| Eye Injury      | 48941000006119   | Open wound of eye   |
| Eye Injury      | 475401019        | Superficial injury of eye and adnexa                            |
| Eye Injury      | 318250013        | Fracture of orbit NOS, open                                     |
| Eye Injury      | 321248014        | Penetrating wound of eye  |
| Eye Injury      | 403003017        | Abrasion or friction burn of eyelids and periocular area        |
| Eye Injury      | 991241000006115  | Superficial injury NOS: cornea                                  |
| Eye Injury      | 28774011         | Open wound of ocular adnexa                                     |
| Eye Injury      | 896721000006115  | Open wound - ocular adnexa                                      |
| Eye Injury      | 141092011        | Open wound of eyeball   |
| Eye Injury      | 898001000006111  | Superficial injury: cornea                                      |
| Eye Injury      | 1233026017       | Glaucoma due to ocular trauma                                   |
| Eye Injury      | 593321000006111  | Contusion of orbital tissues                                    |
| Eye Injury      | 898021000006118  | Superficial injury NOS: cornea                                  |
| Eye Injury      | 322710017        | Superficial injury of cornea NOS                                |
| Eye Injury      | 325303016        | [X]Injury of eye and orbit, part unspecified                    |
| Eye Injury      | 660621000006118  | Injury of eye region  |
| Eye Injury      | 321236011        | Open wound of ocular adnexa NOS                                 |
| Eye Injury      | 5675661000006110 | Laceration of eye region  |
| Eye Injury      | 13532018         | Superficial injury of conjunctiva                               |
| Eye Injury      | 321242010        | Ocular laceration with intraocular prolapse                     |
| Eye Injury      | 20997018         | Avulsion of eye   |
| Eye Injury      | 896771000006119  | Ocular laceration   |
| Eye Injury      | 322026013        | Sequelae of injury of eye and orbit                             |
| Eye Injury      | 646221000006112  | Traumatic enucleation of eye                                    |
| Eye Injury      | 6911431000006110 | Conjunctival laceration   |
| Eye Injury      | 322766017        | Contusion, eyeball  |
| Eye Injury      | 403561000006119  | [X]Ocular laceration, no prolapse/loss intraocular tissue       |

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| Eye Injury | 982271000006119  | Injury to eye   |
| Eye Injury | 321250018        | Open wound of eyeball NOS                                   |
| Eye Injury | 403551000006116  | [X]Ocular laceration and rupture with prolapse or loss of i |
| Eye Injury | 1785232011       | Bruise of eye   |
| Eye Injury | 896761000006114  | Open wound - ocular adnexa NOS                              |
| Eye Injury | 5028531000006110 | Conjunctival injury   |
| Eye Injury | 325302014        | [X]Other injuries of eye and orbit                          |
| Eye Injury | 403011010        | Contusion of eye  |
| Eye Injury | 322712013        | Superficial injury of eye                                   |
| Eye Injury | 322757016        | Black eye   |
| Eye Injury | 506383014        | Ocular open wound   |
| Glaucoma   | 3753251000006110 | CSG - Chronic simple glaucoma                               |
| Glaucoma   | 582671000006113  | Congenital glaucoma   |
| Glaucoma   | 2743971000006110 | Aphakic glaucoma  |
| Glaucoma   | 560611000006117  | Closed angle glaucoma                                       |
| Glaucoma   | 264949013        | Glaucoma monitoring   |
| Glaucoma   | 299482013        | [X]Other glaucoma   |
| Glaucoma   | 459721000006110  | Acute closed-angle glaucoma                                 |
| Glaucoma   | 347754014        | Rubeotic glaucoma   |
| Glaucoma   | 118092013        | Glaucoma of childhood                                       |
| Glaucoma   | 3564451000006110 | Intermittent angle-closure glaucoma                         |
| Glaucoma   | 907841000006110  | [RFC] Glaucoma  |
| Glaucoma   | 378061000000112  | Revision of bleb NEC following glaucoma surgery             |
| Glaucoma   | 4772381000006110 | Secondary angle-closure glaucoma with pupil block           |
| Glaucoma   | 802981000006115  | Glaucoma due to episode of increased venous pressure        |
| Glaucoma   | 1233026017       | Glaucoma due to ocular trauma                               |
| Glaucoma   | 383421000000110  | Needling of bleb following glaucoma surgery                 |
| Glaucoma   | 178757012        | Pseudoexfoliation glaucoma                                  |
| Glaucoma   | 9846871000006110 | Bilateral angle-closure glaucoma                            |
| Glaucoma   | 383401000000118  | Operations following glaucoma surgery NOS                   |
| Glaucoma   | 3753261000006110 | COAG - Chronic open-angle glaucoma                          |
| Glaucoma   | 3317631000006110 | Normal tension glaucoma                                     |
| Glaucoma   | 802901000006112  | Absolute glaucoma   |
| Glaucoma   | 6532571000006110 | Angle-closure glaucoma                                      |
| Glaucoma   | 47081000006113   | Residual stage of open angle glaucoma                       |
| Glaucoma   | 298060018        | Glaucoma associated with disorders of the lens NOS          |
| Glaucoma   | 503452018        | Primary open-angle glaucoma                                 |
| Glaucoma   | 7089401000006110 | Injection of filtering bleb following glaucoma surgery      |
| Glaucoma   | 6532581000006110 | ACG - Angle closure glaucoma                                |
| Glaucoma   | 6050201000006110 | Chronic angle closure glaucoma                              |
| Glaucoma   | 1221368012       | Steroid-induced glaucoma                                    |
| Glaucoma   | 298058015        | Glaucoma in endocrine, nutritional and metabolic diseases   |
| Glaucoma   | 7727931000006110 | Glaucoma caused by silicone oil                             |
| Glaucoma   | 298061019        | Glaucoma associated with other ocular disorders             |
| Glaucoma   | 1220514012       | Optic disc glaucomatous atrophy                             |

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| Glaucoma | 299484014        | Glaucoma due to another disorder                        |
| Glaucoma | 3610261000006110 | Traumatic glaucoma                                      |
| Glaucoma | 298051014        | Steroid-induced glaucoma residual stage                 |
| Glaucoma | 298059011        | Glaucoma due to disease NOS                             |
| Glaucoma | 251653013        | H/O: glaucoma   |
| Glaucoma | 856601000006111  | Glaucoma left eye                                       |
| Glaucoma | 2974891000006110 | Posner-Schlossman syndrome                              |
| Glaucoma | 3753241000006110 | POAG - Primary open-angle glaucoma                      |
| Glaucoma | 3041311000006110 | Chronic angle-closure glaucoma                          |
| Glaucoma | 883301000006118  | Secondary/other glaucoma                                |
| Glaucoma | 3874601000006110 | Open angle glaucoma                                     |
| Glaucoma | 388091000006115  | [X]Glaucoma   |
| Glaucoma | 298072012        | Other specified forms of glaucoma                       |
| Glaucoma | 378721000000118  | Other specified operations following glaucoma surgery   |
| Glaucoma | 140102012        | Open-angle glaucoma                                     |
| Glaucoma | 770481000006118  | Intermittent primary angle-closure glaucoma             |
| Glaucoma | 298075014        | Glaucoma NOS  |
| Glaucoma | 856591000006115  | Glaucoma right eye                                      |
| Glaucoma | 803011000006118  | Glaucoma due to ocular inflammation                     |
| Glaucoma | 2848811000006110 | Secondary open-angle glaucoma                           |
| Glaucoma | 4196691000006110 | Advanced open-angle glaucoma                            |
| Glaucoma | 298052019        | Steroid-induced glaucoma NOS                            |
| Glaucoma | 2676361011       | Removal of releasable suture following glaucoma surgery |
| Glaucoma | 249331000006112  | Panretinal photocoagulation for glaucoma                |
| Glaucoma | 383381000000118  | Injection of bleb following glaucoma surgery            |
| Glaucoma | 399447011        | Glaucoma due to ocular tumour or cyst                   |
| Glaucoma | 674741000006115  | Newborn glaucoma  |
| Glaucoma | 3532561018       | Glaucoma micro-stent                                    |
| Glaucoma | 8111981000006110 | Bilateral absolute glaucoma                             |
| Glaucoma | 298064010        | Glaucoma due to ocular vascular disorder                |
| Glaucoma | 361511000000118  | Operation following glaucoma surgery                    |
| Glaucoma | 347755010        | Neovascular glaucoma                                    |
| Glaucoma | 298054018        | Glaucoma due to chamber angle anomaly                   |
| Glaucoma | 803061000006115  | Glaucoma due to pupillary block                         |
| Glaucoma | 298062014        | Glaucoma due to unspecified ocular disorder             |
| Glaucoma | 3753211000006110 | Primary open angle glaucoma                             |
| Glaucoma | 298047012        | Unspecified primary angle-closure glaucoma              |
| Glaucoma | 6532921000006110 | Phacomorphic glaucoma                                   |
| Glaucoma | 298042018        | Open-angle glaucoma NOS                                 |
| Glaucoma | 4196741000006110 | Secondary open-angle glaucoma with pseudoexfoliation    |
| Glaucoma | 2517661000006110 | Glaucomatous optic atrophy                              |
| Glaucoma | 556201000006114  | Chronic closed-angle glaucoma                           |
| Glaucoma | 54899010         | Phacolytic glaucoma                                     |
| Glaucoma | 3874591000006110 | Wide-angle glaucoma                                     |
| Glaucoma | 3041351000006110 | Chronic narrow angle glaucoma                           |

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| Glaucoma | 49139016         | Hypersecretion glaucoma   |
| Glaucoma | 2983591000006110 | AACG - Acute angle closure glaucoma   |
| Glaucoma | 3899381000006110 | Glaucoma surgery  |
| Glaucoma | 1010721000006110 | Adverse reaction to Drugs Used For Glaucoma   |
| Glaucoma | 141721000006112  | Simple chronic glaucoma   |
| Glaucoma | 495680018        | Normal pressure glaucoma  |
| Glaucoma | 3098461000006110 | Glaucoma with ocular inflammation   |
| Glaucoma | 298071017        | Glaucoma associated with other ocular disorders NOS   |
| Glaucoma | 298050010        | Steroid-induced glaucoma glaucomatous stage   |
| Glaucoma | 1486268015       | Primary angle-closure glaucoma  |
| Glaucoma | 298056016        | Glaucoma due to other anterior segment anomaly  |
| Glaucoma | 298053012        | Secondary glaucoma  |
| Glaucoma | 3872071000006110 | Glaucoma with lens disorder   |
| Glaucoma | 734071000006115  | Low tension glaucoma  |
| Glaucoma | 388101000006114  | [X]Glaucoma in endocrine,nutritional+metabolic diseases CE  |
| Glaucoma | 1226368013       | Glaucomatocyclitic crises   |
| Glaucoma | 298034019        | Unspecified open-angle glaucoma   |
| Glaucoma | 40268016         | Glaucoma  |
| Glaucoma | 3656821000006110 | Juvenile glaucoma   |
| Glaucoma | 316238010        | Traumatic glaucoma due to birth trauma  |
| Glaucoma | 298055017        | Glaucoma due to iris anomaly  |
| Glaucoma | 298049010        | Primary angle-closure glaucoma NOS  |
| Glaucoma | 802911000006110  | Glaucoma associated with disorders of the lens  |
| Glaucoma | 76978010         | Pigmentary glaucoma   |
| Glaucoma | 883291000006119  | Primary closed-angle glaucoma   |
| Glaucoma | 298048019        | Primary angle-closure glaucoma residual stage   |
| Glaucoma | 84105018         | Low tension glaucoma  |
| Glaucoma | 298074013        | Other specified glaucoma NOS  |
| Glaucoma | 2983571000006110 | Acute angle-closure glaucoma  |
| Glaucoma | 1232965011       | Glaucomatous subcapsular flecks   |
| Glaucoma | 378701000000110  | Laser suture lysis following glaucoma surgery   |
| Glaucoma | 411465018        | Glaucoma due to ocular cyst   |
| Glaucoma | 3872051000006110 | Phacogenic glaucoma   |
| HIV      | 288182013        | [X]HIV disease resulting in other non-Hodgkin's lymphoma  |
| HIV      | 1815001000006110 | [X]HIV disease resulting in other non-Hodgkin lymphoma  |
| HIV      | 6973461000006110 | Acquired immune deficiency syndrome dementia complex  |
| HIV      | 287012016        | Human immunodeficiency virus with neurological disease  |
| HIV      | 287023017        | Mycobacteriosis associated with AIDS<br>Burkitt lymphoma co-occurrent with human immunodeficiency virus |
| HIV      | 287029018        | infection   |
| HIV      | 103844015        | Acquired immune deficiency syndrome<br>HIV (human immunodeficiency virus) disease resulting in          |
| HIV      | 8342711000006110 | haematological and immunological abnormalities  |
| HIV      | 1786467016       | HIV (human immunodeficiency virus) 1 ribonucleic acid detection assay                                   |
| HIV      | 1814931000006110 | HIV disease resulting in Kaposi sarcoma   |
| HIV      | 6981961000006110 | Human immunodeficiency virus infection wasting syndrome   |

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| HIV | 389111000006119   | [X]HIV disease resulting/unspcf infectious+parasitic disease                          |
| HIV | 257855012         | HIV positive  |
| HIV | 288178011         | [X]HIV disease resulting in other mycoses   |
| HIV | 389021000006114   | [X]HIV disease resulting in multiple infections                                       |
| HIV | 496781000006111   | Asymptomatic HIV Infection - First Presentation                                       |
| HIV | 1762131000006110  | [SHHAPT] New HIV diagnosis - diagnosed previously elsewhere                           |
| HIV | 3904971000006110  | HIV infection   |
| HIV | 4200801000006110  | Acute human immunodeficiency virus seroconversion illness                             |
| HIV | 6981921000006110  | Cachexia associated with AIDS   |
| HIV | 1761361000006110  | [SHHAPT] New HIV diagnosis - acute  |
| HIV | 6975941000006110  | Pneumonia associated with AIDS  |
| HIV | 3515801000006110  | AIDS - Acquired immunodeficiency syndrome   |
| HIV | 287032015         | HIV disease resulting in lymphoid interstitial pneumonitis                            |
| HIV | 287020019         | Human immunodeficiency virus with other clinical findings                             |
| HIV | 925771000006110   | Notification of AIDS  |
| HIV | 287014015         | Malignant neoplastic disease co-occurrent with human immunodeficiency virus infection |
| HIV | 825861000006116   | HIV disease resulting/unspcf infectious+parasitic disease                             |
| HIV | 264371011         | Human immunodeficiency virus carrier  |
| HIV | 825791000006118   | HIV disease resulting in multiple diseases CE   |
| HIV | 825881000006114   | HIV Infection With Symptoms, Not AIDS - First Presentation                            |
| HIV | 1540131000006110  | HIV (human immunodeficiency virus) ribonucleic acid/deoxyribonucleic acid ratio       |
| HIV | 7711131000006110  | Burkitt's lymphoma co-occurrent with human immunodeficiency virus infection           |
| HIV | 317670010         | [D]Laboratory evidence of human immunodeficiency virus [HIV]                          |
| HIV | 288191012         | [X]Unspecified human immunodeficiency virus [HIV] disease                             |
| HIV | 825871000006111   | Human immunodeficiency virus infection with persistent generalised lymphadenopathy    |
| HIV | 288186011         | [X]HIV disease resulting in unspecified malignant neoplasm                            |
| HIV | 143288017         | Human immunodeficiency virus infection  |
| HIV | 825831000006113   | Pneumocystosis associated with AIDS   |
| HIV | 1816791000006110  | HIV disease complicating pregnancy childbirth puerperium                              |
| HIV | 825721000006115   | Non-Hodgkin lymphoma associated with Human immunodeficiency virus infection           |
| HIV | 1814921000006110  | HIV disease resulting in Pneumocystis jirovecii pneumonia                             |
| HIV | 459601018         | HIV (human immunodeficiency virus) viral load   |
| HIV | 12456741000000000 | [V]Asymptomatic human immunodeficiency virus infection status                         |
| HIV | 829181000006115   | Human immunodeficiency virus with constitutional disease                              |
| HIV | 4596341000006110  | Human immunodeficiency virus (HIV) positive   |
| HIV | 825731000006117   | HIV disease result/haematological+immunologic abnorms,NEC                             |
| HIV | 6981941000006110  | HIV - Human immunodeficiency virus infection wasting syndrome                         |
| HIV | 474391000006110   | AIDS - First Presentation   |
| HIV | 1924211000006110  | Human immunodeficiency virus type 1 subtype identification                            |
| HIV | 1573641000006110  | H/O: HIV  |
| HIV | 376571000006116   | [X]Dementia in human immunodef virus [HIV] disease                                    |



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| HIV | 337231000006117  | [V]Asymptomatic human immunodeficiency virus infection status   |
| HIV | 3994511000006110 | Asymptomatic HIV infection  |
| HIV | 474401000006112  | AIDS - Subsequent Presentation  |
| HIV | 6981971000006110 | Cachexia associated with acquired immunodeficiency syndrome   |
| HIV | 1761381000006110 | [SHHAPT] New HIV diagnosis - late   |
| HIV | 389101000006117  | [X]HIV disease resulting/other infectious+parasitic diseases  |
| HIV | 4200811000006110 | Acute human immunodeficiency virus infection  |
| HIV | 388991000006116  | [X]HIV dis reslt/oth mal neopl/lymph,h'matopoetc+reltd tissu  |
| HIV | 6973421000006110 | Dementia associated with AIDS   |
| HIV | 879271000006114  | Aids +viral/chlamydial dis.NOS  |
| HIV | 4742841000006110 | Human immunodeficiency virus infection with neurological disease  |
| HIV | 825711000006111  | HIV dis reslt/oth mal neopl/lymph,h'matopoetc+reltd tissu   |
| HIV | 6960961000006110 | Mycobacteriosis associated with acquired immunodeficiency syndrome  |
| HIV | 287022010        | Symptomatic human immunodeficiency virus infection  |
| HIV | 2376041000000110 | HIV (human immunodeficiency virus) drug resistance test   |
| HIV | 1762141000006110 | [SHHAPT] New HIV diagnosis - acute - diagnosed prev. elsewhere  |
| HIV | 287025012        | HIV disease resulting in candidiasis  |
| HIV | 4634221000006110 | Notification of acquired immune deficiency syndrome   |
| HIV | 1814951000006110 | HIV disease resulting in other types of non-Hodgkin lymphoma  |
| HIV | 1761351000006110 | [SHHAPT] New HIV diagnosis  |
| HIV | 288190013        | [X]HIV disease resulting in other specified conditions  |
| HIV | 1121631000000110 | Human immunodeficiency virus annual review  |
| HIV | 287024011        | HIV disease resulting in cytomegaloviral disease  |
| HIV | 365853018        | Acute HIV infection   |
| HIV | 6973451000006110 | ADC - Acquired immune deficiency syndrome dementia complex  |
| HIV | 264418012        | Notification of AIDS  |
| HIV | 1762151000006110 | [SHHAPT] New HIV diagnosis - late - diagnosed prev. elsewhere   |
| HIV | 3904981000006110 | HIV - Human immunodeficiency virus infection  |
| HIV | 1761311000006110 | [SHHAPT] HIV positive   |
| HIV | 4742821000006110 | Human immunodeficiency virus infection constitutional disease   |
| HIV | 925451000006113  | AIDS carrier<br>Human immunodeficiency virus infection with secondary clinical infectious disease   |
| HIV | 829221000006112  |   |
| HIV | 288177018        | [X]HIV disease resulting in other viral infections  |
| HIV | 603931000000114  | Human immunodeficiency virus viral load by log rank   |
| HIV | 287031010        | HIV disease resulting in multiple malignant neoplasms<br>HIV (human immunodeficiency virus) disease resulting in haematological and immunological abnormalities |
| HIV | 389001000006116  |   |
| HIV | 6960951000006110 | Mycobacteriosis associated with AIDS  |
| HIV | 2168331000000110 | HIV disease resulting in Burkitt lymphoma   |
| HIV | 3515781000006110 | Acquired immunodeficiency syndrome  |
| HIV | 4742831000006110 | HIV - Human immunodeficiency virus infection constitutional disease   |
| HIV | 288174013        | [X]HIV disease resulting in other bacterial infections  |
| HIV | 3515791000006110 | Immunodeficiency due to human immunodeficiency virus infection  |
| HIV | 3515761000006110 | AIDS  |
| HIV | 496791000006114  | Asymptomatic HIV Infection - Subsequent Presentation  |

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| HIV  | 6981931000006110  | Slim disease  |
| HIV  | 6955711000006110  | Kaposi sarcoma associated with AIDS   |
| HIV  | 3515811000006110  | Acquired immune deficiency syndrome (AIDS)  |
| HIV  | 1761401000006110  | [SHHAPT] Attendance for HIV related care  |
| HIV  | 854381000006118   | HIV infection   |
| HIV  | 389011000006118   | [X]HIV disease resulting in multiple diseases classified elsewhere                    |
| HIV  | 6955721000006110  | Kaposi's sarcoma associated with acquired immunodeficiency syndrome                   |
| HIV  | 825841000006115   | HIV disease resulting in unspecified malignant neoplasm                               |
| HIV  | 4596351000006110  | Human immunodeficiency virus positive   |
| HIV  | 6953541000006110  | Pneumocystosis associated with acquired immunodeficiency syndrome                     |
| HIV  | 6973471000006110  | Dementia associated with acquired immunodeficiency syndrome                           |
| HIV  | 825891000006112   | HIV Infection With Symptoms, Not AIDS - Subsequent Presentation                       |
| HIV  | 2622348012        | HIV disease resulting in wasting syndrome   |
| HIV  | 6973431000006110  | Acquired immune deficiency syndrome-related dementia                                  |
| HIV  | 6975951000006110  | Pneumonia associated with acquired immunodeficiency syndrome                          |
| HIV  | 6973441000006110  | AIDS - Acquired immune deficiency syndrome dementia complex                           |
| HIV  | 908851000006113   | [RFC] AIDS/HIV  |
| HIV  | 287021015         | Acquired human immunodeficiency virus infection syndrome NOS                          |
| HIV  | 152322017         | Asymptomatic human immunodeficiency virus infection                                   |
| HIV  | 906841000006112   | [RFC] HIV/AIDS  |
| HIV  | 287027016         | HIV disease resulting in multiple infections  |
| HIV  | 288185010         | Malignant neoplastic disease co-occurrent with human immunodeficiency virus infection |
| HIV  | 825771000006119   | Kaposi's sarcoma associated with AIDS   |
| HIV  | 11989691000000000 | HIV disease resulting in mycobacterial infection                                      |
| HIV  | 4063961000006110  | Human immunodeficiency virus infection with persistent generalized lymphadenopathy    |
| HIV  | 288173019         | [X]Human immunodeficiency virus disease   |
| HSV1 | 2649641000006110  | Herpes simplex keratitis  |
| HSV1 | 2649651000006110  | Herpetic keratitis  |
| HSV1 | 286757013         | Herpesviral vesicular dermatitis  |
| HSV1 | 222861000000113   | Cold sore (herpetic)  |
| HSV1 | 3570019           | Herpes labialis   |
| HSV1 | 286746015         | Ophthalmic herpes simplex   |
| HSV1 | 822411000006114   | Herpetic aphthous ulceration  |
| HSV1 | 365556016         | Infective otitis externa due to herpes simplex  |
| HSV1 | 822021000006114   | Herpes simplex encephalitis   |
| HSV1 | 360213013         | Scrum pox   |
| HSV1 | 358971000006114   | [X] Herpes labialis   |
| HSV1 | 23218017          | Herpes simplex iridocyclitis  |
| HSV1 | 6589121000006110  | HSV keratouveitis   |
| HSV1 | 640901000006112   | Encephalitis due to human herpes simplex virus  |
| HSV1 | 288088014         | [X]Anogenital herpes viral infection, unspecified                                     |
| HSV1 | 2521861000006110  | Cold sores  |
| HSV1 | 254240019         | O/E - herpes labialis   |
| HSV1 | 50111015          | Herpes simplex dendritic keratitis  |

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| HSV1        | 7069191000006110 | Herpes simplex corneal endotheliitis  |
| HSV1        | 5074521000006110 | Recurrent oral herpes simplex infection   |
| HSV1        | 222871000000118  | Stomatitis - herpetic   |
| HSV1        | 286749010        | Herpes simplex eyelid dermatitis  |
| HSV1        | 6076381000006110 | Herpetiform aphthous stomatitis   |
| HSV1        | 6076411000006110 | Oral herpetiform aphthous ulceration  |
| HSV1        | 821961000006114  | Herpes labialis   |
| HSV1        | 822181000006114  | Herpes simplex- otitis externa  |
| HSV1        | 286752019        | Ophthalmic herpes simplex NOS   |
| HSV1        | 96292016         | Herpetic gingivostomatitis  |
| HSV1        | 5148251000006110 | Cutaneous herpes simplex infection  |
| HSV1        | 822081000006113  | Herpes simplex ophthalmicus   |
| HSV1        | 406259010        | Unspecified ophthalmic herpes   |
| HSV1        | 98860016         | Herpes simplex disciform keratitis  |
| HSV1        | 6589111000006110 | Herpes simplex keratouveitis  |
| HSV1        | 5074491000006110 | Oral herpes simplex infection   |
| HSV1        | 6671381000006110 | Recurrent herpetic keratitis  |
| HSV1        | 2521891000006110 | Cold sore   |
| HSV1        | 932631000006114  | Herpes labialis   |
| HSV1        | 879161000006114  | Herpetic stomatitis   |
| HSV1        | 254238012        | O/E-herpes labialis-cold sore   |
| HSV1        | 254239016        | O/E - cold sore   |
| HSV1        | 1763921000006110 | Herpes simplex type 1 PCR positive  |
| HSV1        | 6902021000006110 | Herpes simplex virus epithelial keratitis   |
| HSV1        | 179027016        | Herpes simplex otitis externa   |
| Head Injury | 602701000006116  | Crushing injury of head, part unspecified   |
| Head Injury | 882661000006117  | Post concussional syndrome  |
| Head Injury | 695771000006119  | Multiple fractures involving skull/face with other bones NOS  |
| Head Injury | 347972012        | Contusion, forehead   |
| Head Injury | 422387012        | Degloving injury of head  |
| Head Injury | 119023019        | Fracture of skull   |
| Head Injury | 896841000006115  | Open wound - forehead<br>Closed fracture of base of skull with intracranial injury, with 1-24 hours |
| Head Injury | 560001000006112  | loss of consciousness   |
| Head Injury | 402948010        | Open wound of head, neck and trunk  |
| Head Injury | 853541000006117  | Post head injury syndrome   |
| Head Injury | 907031000006111  | [RFC] Head injury   |
| Head Injury | 325687012        | [X]Sequelae of other specified injury of head   |
| Head Injury | 62810012         | Late effect of fracture of skull and face bones   |
| Head Injury | 735201000006116  | Late effect of skull fracture   |
| Head Injury | 560051000006111  | Closed #skull bse no intracranial injury + concussion unspec  |
| Head Injury | 264151000006112  | Open #skull bse + intracranial injury, LOC unspec duration  |
| Head Injury | 321283013        | Other open wound of head  |
| Head Injury | 129111000006116  | Splinter of head, without major open wound or infection   |
| Head Injury | 458418015        | Cleaning of skin wound of head or neck  |

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| Head Injury | 318256019        | Other and unqualified skull fractures                        |
| Head Injury | 897351000006113  | Head/neck blood vessel injury                                |
| Head Injury | 325312019        | [X]Other specified injuries of head                          |
| Head Injury | 696131000006112  | Mult #skull/face + other bones, open, no intracranial injury |
| Head Injury | 23191000006116   | Other open wound of head                                     |
| Head Injury | 321824010        | Other head and neck blood vessel injury NOS                  |
| Head Injury | 402829012        | Skull fracture NOS   |
| Head Injury | 411234012        | Traumatic brain injury                                       |
| Head Injury | 345102013        | Post-traumatic brain syndrome                                |
| Head Injury | 560421000006110  | Closed #skull vlt with intracranial injury+concussion unspec |
| Head Injury | 325270016        | Crushing injuries involving head with neck                   |
| Head Injury | 5967541000006110 | Referral to head injury rehabilitation                       |
| Head Injury | 318144013        | Fracture of vault of skull NOS                               |
| Head Injury | 1808531000006110 | Traumatic brain injury                                       |
| Head Injury | 325307015        | Crush injury of head and neck                                |
| Head Injury | 324026012        | Multiple injuries of head                                    |
| Head Injury | 318117015        | Closed fracture vault of skull with intracranial injury      |
| Head Injury | 3515077010       | Contusion of head  |
| Head Injury | 321349015        | Other open wound of head with complication                   |
| Head Injury | 4396301000006110 | Traumatic brain injury with moderate loss of consciousness   |
| Head Injury | 390534012        | Crush injury of head   |
| Head Injury | 322124014        | Splinter of head, without major open wound or infection, NOS |
| Head Injury | 321825011        | Head and neck blood vessel injury NOS                        |
| Head Injury | 322135016        | Superficial injury of scalp NOS                              |
| Head Injury | 322129016        | Splinter of head, without major open wound, infected, NOS    |
| Head Injury | 402830019        | Multiple fractures involving skull or face with other bones  |
| Head Injury | 318126017        | Open fracture vault of skull without intracranial injury     |
| Head Injury | 390551000006116  | Injury of blood vessels of head AND/OR neck                  |
| Head Injury | 409932013        | Minor head injury  |
| Head Injury | 202903013        | Concussion   |
| Head Injury | 768961000006113  | Intracranial injury, excluding those with skull fracture NOS |
| Head Injury | 318343012        | Fracture of skull NOS  |
| Head Injury | 216991000006113  | Post-head injury syndrome                                    |
| Head Injury | 325699017        | [X]Sequelae of unspecified injury of head                    |
| Head Injury | 264241000006118  | Open #skull bse no intracranial injury, LOC unspec duration  |
| Head Injury | 322141011        | Superficial injury of head NOS, infection NOS                |
| Head Injury | 320597013        | Brain concussion   |
| Head Injury | 322025012        | Sequelae of open wound of head                               |
| Head Injury | 492615014        | Post-concussion syndrome                                     |
| Head Injury | 390533018        | Crushing injury of skull and intracranial contents           |
| Head Injury | 318135012        | Open fracture vault of skull with intracranial injury        |
| Head Injury | 459051012        | Major head injury  |
| Head Injury | 325294016        | [X]Fractures of other skull and facial bones                 |
| Head Injury | 322864011        | Crushing injury of skull                                     |
| Head Injury | 318341014        | Multiple fractures involving skull and facial bones          |

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| Head Injury | 390672011        | Traumatic AND/OR non-traumatic brain injury  |
| Head Injury | 390461014        | Head injury NOS  |
| Head Injury | 6048871000006110 | Moderate head injury   |
| Head Injury | 696151000006117  | Mult #skull/face+other bones, closed, no intracranial injury   |
| Head Injury | 259601000006113  | Open fracture of base of skull with intracranial injury  |
| Head Injury | 322125010        | Splinter of head, without major open wound, infected   |
| Head Injury | 321484017        | Open wounds involving head with neck   |
| Head Injury | 560371000006115  | Closed #skull vlt no intracranial injury, <1hr loss of consc   |
| Head Injury | 322024011        | Sequelae of superficial injury of head   |
| Head Injury | 559971000006115  | Closed #skull bse + intracranial injury + concussion unspec  |
| Head Injury | 403055016        | Head and neck superficial nerve injury   |
| Head Injury | 7965591000006110 | Closed head injury   |
| Head Injury | 263821000006111  | Open #skull vlt no intracranial injury, <1hr loss of consc   |
| Head Injury | 129141000006117  | Splinter of head, without major open wound, infected   |
| Head Injury | 1874171000006110 | Child young persons injury - head injury (concussion)  |
| Head Injury | 321350015        | Open wound of head NOS   |
| Head Injury | 318236015        | Fracture of skull and facial bones   |
| Head Injury | 5141016          | Open wound of forehead with complication   |
| Head Injury | 561661000006110  | Closed fracture of base of skull without intracranial injury   |
| Head Injury | 559981000006117  | Closed fracture of base of skull with intracranial injury, with less than 1 hour loss of consciousness |
| Head Injury | 560101000006111  | Closed #skull bse no intracranial injury, unspec state consc   |
| Head Injury | 560021000006119  | Closed fracture of base of skull with intracranial injury, with no loss of consciousness               |
| Head Injury | 565191000006110  | Closed fracture of vault of skull without intracranial injury  |
| Head Injury | 325306012        | [X]Crushing injury of other parts of head  |
| Head Injury | 560301000006114  | Closed fracture of vault of skull with intracranial injury, with 1-24 hours loss of consciousness      |
| Head Injury | 750611000006113  | Sequelae of injuries of head   |
| Head Injury | 263861000006117  | Open #skull vlt no intracranial injury, no loss of consc   |
| Head Injury | 560401000006117  | Closed #skull vlt no intracranial injury, no loss of consc   |
| Head Injury | 4396291000006110 | Traumatic brain injury with brief loss of consciousness  |
| Head Injury | 1009581000006110 | Cause of learning disabilities: Late effect of head injury   |
| Head Injury | 318285013        | Open fracture of skull NOS with intracranial injury  |
| Head Injury | 1780184010       | Head injury advice given   |
| Head Injury | 390476018        | Bruise of head   |
| Head Injury | 3117781000006110 | Head - open wound  |
| Head Injury | 817741000006111  | Head injury - nursing supervis   |
| Head Injury | 423061000006115  | [X]Post-traumatic brain syndrome   |
| Head Injury | 323994014        | Injury of muscle and tendon of head  |
| Head Injury | 325293010        | [X]Open wound of other parts of head   |
| Head Injury | 898441000006119  | Crush injury - head/neck   |
| Head Injury | 325290013        | Injury of head   |
| Head Injury | 560411000006119  | Closed #skull vlt no intracranial injury, unspec state consc   |
| Head Injury | 560331000006118  | Closed #skull vlt + intracranial injury, unspec state consc  |
| Head Injury | 561651000006113  | Closed fracture of base of skull with intracranial injury  |

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| Head Injury | 4174161000006110 | Mild traumatic brain injury   |
| Head Injury | 560361000006110  | Closed #skull vlt no intracranial injury + concussion unspec  |
| Head Injury | 1776741000006110 | Reason for referral: Head Injury  |
| Head Injury | 776021000006111  | Injury of blood vessels of head, NEC  |
| Head Injury | 613741000006112  | Depressed skull fracture NOS  |
| Head Injury | 817721000006116  | Head injury   |
| Head Injury | 316190012        | Fracture of skull due to birth trauma   |
| Head Injury | 3838151000006110 | HI - Head injury  |
| Head Injury | 4396281000006110 | Traumatic brain injury with loss of consciousness<br>Closed fracture of base of skull with intracranial injury, with more than<br>24 hours loss of consciousness and return to pre-existing conscious level |
| Head Injury | 559991000006119  | 24 hours loss of consciousness and return to pre-existing conscious level   |
| Head Injury | 322081018        | Abrasion of head  |
| Head Injury | 4174111000006110 | Concussion injury of brain  |
| Head Injury | 750631000006119  | Late effect of injury to blood vessel of head, neck and extremities   |
| Head Injury | 560311000006112  | Closed #skull vlt + intracranial injury, LOC unspec duration  |
| Head Injury | 560081000006115  | Closed #skull bse no intracranial injury, 1-24hr loss consc   |
| Head Injury | 774541000006119  | Injury to blood vessels of head and neck  |
| Head Injury | 1954631000006110 | Head injury (secondary group)   |
| Head Injury | 817641000006117  | Head and neck superficial nerve injury  |
| Head Injury | 402961010        | Open wound of head, neck and trunk NOS  |
| Head Injury | 696141000006119  | Mult #skull/face+other bones, closed + intracranial injury  |
| Head Injury | 321303012        | Open wound of forehead  |
| Head Injury | 322131013        | Superficial injury of head  |
| Head Injury | 40395011         | Skull base fracture   |
| Head Injury | 5668631000006110 | Head and neck injury  |
| Head Injury | 322732014        | Superficial injuries involving head with neck   |
| Head Injury | 80749019         | Fracture of vault of skull  |
| Head Injury | 149611000006111  | Sequelae of unspecified injury of head  |
| Head Injury | 694981000006118  | Multiple fractures of skull   |
| Head Injury | 423091000006111  | Post-concussional syndrome  |
| Head Injury | 275061014        | Exploration of wound of skin of head or neck NEC  |
| Head Injury | 768881000006110  | Intracranial injury, without skull fracture   |
| Head Injury | 402979014        | Late effect of intracranial injury NOS  |
| Head Injury | 321989016        | Late effect of open wound of head, neck and trunk   |
| Head Injury | 259611000006111  | Open fracture base skull without mention intracranial injury  |
| Head Injury | 322072012        | Superficial injury to head, excluding eye   |
| Head Injury | 325292017        | [X]Superficial injury of other parts of head  |
| Head Injury | 264451000006115  | Open #skull bse + intracranial injury + concussion unspec   |
| Head Injury | 136462012        | Head injury   |
| Head Injury | 251820017        | H/O: head injury  |
| Head Injury | 1209864014       | Closed fracture of skull  |
| Head Injury | 263771000006115  | Open #skull vlt + intracranial injury, LOC unspec duration  |
| Head Injury | 322130014        | Multiple superficial injuries of head   |
| Head Injury | 563791000006110  | Closed fracture of skull NOS without intracranial injury  |
| Head Injury | 325295015        | [X]Fracture of skull and facial bones, part unspecified   |

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|--------------|------------------|--|
| Head Injury  | 318196011        | Fracture of base of skull  |
| Head Injury  | 1984181000006110 | Manchester triage - Head injury  |
| Head Injury  | 6115016          | Open wound of drumhead without complication  |
| Head Injury  | 698741000006119  | Minor head injury  |
| Head Injury  | 63422013         | Open wound of head   |
| Head Injury  | 4396321000006110 | Traumatic brain injury with no loss of consciousness   |
| Head Injury  | 123686019        | Late effect of intracranial injury without skull fracture  |
| Head Injury  | 560091000006117  | Closed #skull bse no intracranial injury, no loss of consc   |
| Head Injury  | 321819012        | Other head and neck blood vessel injury  |
| Head Injury  | 129121000006112  | Splinter of head, without major open wound or infection  |
| Head Injury  | 318266010        | Closed skull fracture with intracranial injury   |
| Head Injury  | 560061000006113  | Closed #skull bse no intracranial injury, <1hr loss of consc<br>Stage 1 hypertension (NICE 2011) without evidence of end organ<br>damage |
| Hypertension | 1908711000006110 |  |
| Hypertension | 28411000033112   | Centrally Acting Antihypertensive Drugs  |
| Hypertension | 99042012         | Essential hypertension   |
| Hypertension | 2645973019       | Chronic peripheral venous hypertension   |
| Hypertension | 300871017        | [X]Hypertension secondary to other renal disorders   |
| Hypertension | 299677011        | Secondary malignant hypertension NOS   |
| Hypertension | 300869017        | [X]Hypertensive diseases   |
| Hypertension | 3119661000006110 | Hypertensive nephropathy   |
| Hypertension | 4199561000006110 | Poisoning caused by antihypertensive agent   |
| Hypertension | 2117971000000110 | Hypertension self-management plan agreed   |
| Hypertension | 1780253016       | Hypertension six month review  |
| Hypertension | 93494011         | Systolic hypertension  |
| Hypertension | 251674014        | H/O: hypertension  |
| Hypertension | 3642801000006110 | Malignant hypertension   |
| Hypertension | 905451000006118  | [RFC] Pulmonary embolism/pulmonary hypertension  |
| Hypertension | 84112010         | Hypertensive crisis  |
| Hypertension | 131046010        | Malignant essential hypertension   |
| Hypertension | 1529013          | Blind hypertensive eye   |
| Hypertension | 299682016        | Secondary hypertension NOS   |
| Hypertension | 2681651000006110 | Pulmonary hypertensive arterial disease  |
| Hypertension | 53452019         | Secondary hypertension   |
| Hypertension | 530161000000111  | Trial reduction of antihypertensive therapy  |
| Hypertension | 151161000006115  | Malignant secondary hypertension   |
| Hypertension | 3117411000006110 | High blood pressure  |
| Hypertension | 324338010        | Other hypertensive agent poisoning   |
| Hypertension | 19441000006114   | Other pre-existing hypertension in preg/childb/puerp NOS   |
| Hypertension | 395753015        | Hypertensive renal disease NOS   |
| Hypertension | 4540441000006110 | History of hypertension  |
| Hypertension | 350517010        | Thromboembolic pulmonary hypertension<br>Severe hypertension (NICE - National Institute for Health and Clinical<br>Excellence 2011)      |
| Hypertension | 1846961000006110 |  |
| Hypertension | 3117461000006110 | Systemic arterial hypertension   |
| Hypertension | 2193031000000110 | Stage 1 hypertension   |

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| Hypertension | 84111015          | Hypertensive encephalopathy  |
| Hypertension | 64172013          | Elevated blood pressure  |
| Hypertension | 3468501000006110  | Systemic primary arterial hypertension   |
| Hypertension | 19451000006111    | Other pre-existing hypertension in preg/childb/puerp unspec  |
| Hypertension | 264473010         | Hypertension:follow-up default   |
| Hypertension | 3898611000006110  | Pre-existing hypertension complicating pregnancy   |
| Hypertension | 1806141000006110  | Severe hypertension  |
| Hypertension | 2193021000000110  | Severe hypertension  |
| Hypertension | 28311000033116    | Vasodilator Antihypertensive Drugs   |
| Hypertension | 299686018         | Other specified hypertensive disease   |
| Hypertension | 12488211000000000 | Hypertension treatm. started   |
| Hypertension | 305818015         | Pre-eclampsia or eclampsia with pre-existing hypertension  |
| Hypertension | 64168014          | Hypertensive disease   |
| Hypertension | 19431000006116    | Other pre-existing hypertension in preg/childb/puerp - deliv   |
| Hypertension | 351481000006111   | [X] Adverse reaction to antihypertensives NOS  |
| Hypertension | 351401000000114   | Primary pulmonary hypertension drugs Band 2  |
| Hypertension | 19421000006119    | Other pre-exist hypertension in preg/childb/puerp-not deliv  |
| Hypertension | 443764015         | On treatment for hypertension  |
| Hypertension | 523801000006119   | BP - hypertensive disease  |
| Hypertension | 2115801000000110  | Hypertension self-management plan review   |
| Hypertension | 146259010         | Secondary pulmonary hypertension   |
| Hypertension | 12726241000000000 | Adverse reaction to antihypertensives NOS  |
| Hypertension | 12726231000000000 | Adverse reaction to other antihypertensives  |
| Hypertension | 331291010         | Adverse reaction to other antihypertensives  |
| Hypertension | 158241000006117   | Secondary hypertension NOS   |
| Hypertension | 356121000006111   | [X] Adverse reaction to other antihypertensives  |
| Hypertension | 19411000006110    | Other pre-exist hypertension in preg/childb/puerp + p/n comp   |
| Hypertension | 350601000000116   | High cost hypertension drugs   |
| Hypertension | 108730018         | Malignant hypertensive renal disease   |
| Hypertension | 535591000000118   | Trial withdrawal of antihypertensive therapy declined  |
| Hypertension | 1011871000006110  | Adverse reaction to Vasodilator Antihypertensive Drugs   |
| Hypertension | 212961000006118   | Pre-eclampsia or eclampsia + pre-existing hypertension NOS<br>Pre-existing secondary hypertension complicating pregnancy, childbirth<br>and puerperium |
| Hypertension | 213081000006118   |  |
| Hypertension | 1706551000000110  | Hypertension 9 month review  |
| Hypertension | 395751018         | Essential hypertension NOS   |
| Hypertension | 1780252014        | Hypertension treatment refused   |
| Hypertension | 351381000000114   | Primary pulmonary hypertension drugs Band 1  |
| Hypertension | 404471000006113   | [X]Oth antihyperten drug caus advers eff in therap use, NEC  |
| Hypertension | 790121000006116   | Hypertension   |
| Hypertension | 351361000000117   | Other specified high cost hypertension drugs   |
| Hypertension | 3784371000006110  | Accelerated essential hypertension   |
| Hypertension | 264486018         | Hypertensive treatment changed   |
| Hypertension | 1992471000006110  | VTE risk assessment - uncontrolled systolic hypertension   |
| Hypertension | 43850011          | Pulmonary arterial hypertension  |



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| Hypertension | 5057801000006110  | Chronic thromboembolic pulmonary hypertension  |
| Hypertension | 12496011          | Hypertensive retinopathy   |
| Hypertension | 351441000000112   | Primary pulmonary hypertension drugs Band 4  |
| Hypertension | 1806071000006110  | Stage 1 hypertension   |
| Hypertension | 2159168015        | Patient on maximal tolerated antihypertensive therapy                                    |
| Hypertension | 2297871000000110  | Pulmonary arterial hypertension drugs Band 1   |
| Hypertension | 940001000006110   | Hypertension medication review   |
| Hypertension | 3117481000006110  | HT - Hypertension  |
| Hypertension | 299676019         | Secondary malignant renovascular hypertension  |
| Hypertension | 4634851000006110  | Treatment for hypertension started   |
| Hypertension | 1846991000006110  | Stage 2 hypertension (NICE - National Institute for Health and Clinical Excellence 2011) |
| Hypertension | 3898601000006110  | Pre-existing hypertension in obstetric context   |
| Hypertension | 299678018         | Secondary benign hypertension  |
| Hypertension | 99047018          | Primary hypertension   |
| Hypertension | 884121000006111   | Malignant hypertension   |
| Hypertension | 1780319017        | Hypertension annual review   |
| Hypertension | 324342013         | Hypertensive agent poisoning NOS   |
| Hypertension | 2681661000006110  | Hypertensive pulmonary arterial disease  |
| Hypertension | 299684015         | Hypertension secondary to drug   |
| Hypertension | 3117521000006110  | Hypertensive disorder, systemic arterial   |
| Hypertension | 3117421000006110  | Hypertensive vascular disease  |
| Hypertension | 1749291000006110  | Thromboembolic pulmonary hypertension  |
| Hypertension | 12487991000000000 | Hypertensive treatm.changed  |
| Hypertension | 264485019         | Treatment for hypertension started   |
| Hypertension | 47076011          | Renal hypertension   |
| Hypertension | 4775791000006110  | Malignant secondary renovascular hypertension  |
| Hypertension | 1823901000006110  | Hypertension confirmed   |
| Hypertension | 300870016         | [X]Other secondary hypertension  |
| Hypertension | 2297911000000110  | Pulmonary arterial hypertension drugs Band 2   |
| Hypertension | 264487010         | Treatment for hypertension stopped   |
| Hypertension | 422681000006111   | Poisoning by antihypertensive agent  |
| Hypertension | 3654641000006110  | PHT - Pulmonary hypertension   |
| Hypertension | 3654631000006110  | Pulmonary hypertension   |
| Hypertension | 2297951000000110  | Pulmonary arterial hypertension drugs Band 3   |
| Hypertension | 8286581000006110  | Stage 2 hypertension   |
| Hypertension | 3950631000006110  | Accelerated secondary hypertension   |
| Hypertension | 64282015          | Hypertensive renal disease   |
| Hypertension | 1780318013        | Moderate hypertension control  |
| Hypertension | 2297991000000110  | Pulmonary arterial hypertension drugs Band 4   |
| Hypertension | 3117471000006110  | HBP - High blood pressure  |
| Hypertension | 80224019          | Diastolic hypertension   |
| Hypertension | 1409014           | Benign hypertensive renal disease  |
| Hypertension | 213111000006112   | Pre-existing hypertension complicating pregnancy, childbirth and puerperium              |
| Hypertension | 3693711000006110  | Benign secondary renovascular hypertension   |

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| Hypertension   | 3135013           | Benign essential hypertension   |
| Hypertension   | 4775831000006110  | Hypertension secondary to endocrine disorder  |
| Hypertension   | 351421000000117   | Primary pulmonary hypertension drugs Band 3   |
| Hypertension   | 2474335018        | Hypertension clinical management plan   |
| Hypertension   | 4634891000006110  | Treatment for hypertension stopped  |
| Hypertension   | 1011861000006110  | Adverse reaction to Antihypertensive Drugs  |
| Hypertension   | 39871000006113    | Oth pre-exist hypert in preg/childb/puerp -del with p/n comp  |
| Hypertension   | 790031000006119   | Hypertension annual review  |
| Hypertension   | 535651000000113   | Trial reduction of antihypertensive therapy declined  |
| Hypertension   | 887811000006117   | Preg.+ pre-existing hypertensn  |
| Hypertension   | 2478822013        | Secondary benign renovascular hypertension  |
| Hypertension   | 1806081000006110  | Stage 2 hypertension  |
| Hypertension   | 331302012         | Antihypertensive adverse reaction   |
| Hypertension   | 451424017         | Antihypertensive therapy  |
| Hypertension   | 351341000000118   | High cost hypertension drugs NOS  |
| Hypertension   | 3117451000006110  | BP - High blood pressure  |
| Hypertension   | 4634871000006110  | Hypertensive treatment changed<br>Stage 1 hypertension (NICE - National Institute for Health and Clinical<br>Excellence 2011) |
| Hypertension   | 1846941000006110  | Excellence 2011)  |
| Hypertension   | 530221000000112   | Trial withdrawal of antihypertensive therapy  |
| Hypertension   | 8286321000006110  | Resistant hypertension  |
| Hypertension   | 4356081000006110  | Hypertension due to renovascular disease  |
| Hypertension   | 3117431000006110  | Hypertensive vascular degeneration  |
| Hypertension   | 2193971000000110  | Hypertension resistant to drug therapy  |
| Hypertension   | 264471012         | Good hypertension control   |
| Hypertension   | 12488221000000000 | Hypertension treatm.stopped   |
| Hypertension   | 4775861000006110  | Hypertension caused by drug   |
| Hypertension   | 4199551000006110  | Antihypertensive poisoning  |
| Hypertension   | 299680012         | Benign secondary hypertension   |
| Hypertension   | 1011881000006110  | Adverse reaction to Centrally Acting Antihypertensive Drugs   |
| Hypertension   | 264472017         | Poor hypertension control   |
| Hypertension   | 2011000033113     | Antihypertensive Drugs  |
| Hypertension   | 299687010         | Hypertensive disorder   |
| Hypertension   | 3117491000006110  | High blood pressure disorder  |
| Hypertension   | 11777411000000000 | Renal disease due to hypertension   |
| Hypertension   | 3117501000006110  | BP+ - Hypertension  |
| Hypertension   | 299683014         | Renovascular hypertension   |
| Hypertension   | 299681011         | Hypertension secondary to endocrine disorders   |
| Hypertension   | 3117511000006110  | HTN - Hypertension  |
| Hypertension   | 1908721000006110  | Stage 1 hypertension (NICE 2011) with evidence of end organ damage  |
| Hypertension   | 305764016         | Other pre-existing hypertension in preg/childbirth/puerp  |
| Hypertension   | 909441000006118   | [RFC] Hypertension  |
| Lyme's disease | 454170015         | Lyme immunoblot reactive  |
| Lyme's disease | 1786232019        | Borrelia burgdorferi nucleic acid detection   |
| Lyme's disease | 1927231000006110  | Lyme neuroborreliosis   |

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| Lyme's disease     | 648201000006115  | ECM - Erythema chronicum migrans   |
| Lyme's disease     | 454163015        | Lyme ELISA positive  |
| Lyme's disease     | 39462014         | Lyme disease   |
| Lyme's disease     | 239013100000110  | Borrelial lymphocytoma   |
| Lyme's disease     | 56659013         | Lyme arthritis   |
| Lyme's disease     | 454164014        | Lyme immunoblot positive   |
| Lyme's disease     | 129217018        | Lyme carditis  |
| Lyme's disease     | 498335012        | Lingual erythema migrans   |
| Lyme's disease     | 485678014        | Arthritis in Lyme disease  |
| Lyme's disease     | 2955528012       | Erythema migrans   |
| Lyme's disease     | 481640018        | Lyme borreliosis   |
| Marfan's syndrome  | 32612014         | Marfan's syndrome  |
| Multiple Sclerosis | 297177019        | Multiple sclerosis of the spinal cord  |
| Multiple Sclerosis | 167438100000110  | Multiple sclerosis monitoring first letter   |
| Multiple Sclerosis | 4769281000006110 | Multiple sclerosis of the brainstem  |
| Multiple Sclerosis | 699731000000110  | Management of multiple sclerosis in early disease phase                                    |
| Multiple Sclerosis | 695191000006119  | Multiple sclerosis of the brain stem   |
| Multiple Sclerosis | 7092351000006110 | Multiple sclerosis (MS) primary progressive  |
| Multiple Sclerosis | 300141000000119  | Multiple sclerosis care plan agreed  |
| Multiple Sclerosis | 7567771000006110 | Multiple sclerosis clinic  |
| Multiple Sclerosis | 1675051000000110 | Multiple sclerosis monitoring third letter   |
| Multiple Sclerosis | 1679791000006110 | Management of multiple sclerosis in progressive disability phase                           |
| Multiple Sclerosis | 297181019        | Multiple sclerosis NOS   |
| Multiple Sclerosis | 299241000000110  | Multiple sclerosis review  |
| Multiple Sclerosis | 297180018        | Exacerbation of multiple sclerosis   |
| Multiple Sclerosis | 979461000006111  | Specialised services for patients with multiple sclerosis enhanced services administration |
| Multiple Sclerosis | 983261000006119  | Multiple sclerosis - personal health plan  |
| Multiple Sclerosis | 7058051000006110 | Multiple sclerosis (MS) relapsing remitting  |
| Multiple Sclerosis | 983291000006110  | Multiple sclerosis - primary progressive   |
| Multiple Sclerosis | 315671000000110  | Multiple sclerosis multidisciplinary review  |
| Multiple Sclerosis | 1674661000000110 | Multiple sclerosis monitoring second letter  |

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|-----------------------|------------------|---|
| Multiple Sclerosis    | 641211000000118  | Benign multiple sclerosis                                   |
| Multiple Sclerosis    | 641301000000114  | Malignant multiple sclerosis                                |
| Multiple Sclerosis    | 1757431000000110 | Referral to community multiple sclerosis team               |
| Multiple Sclerosis    | 908811000006112  | [RFC] Multiple sclerosis                                    |
| Multiple Sclerosis    | 297179016        | Generalised multiple sclerosis                              |
| Multiple Sclerosis    | 1223979019       | Disseminated sclerosis                                      |
| Multiple Sclerosis    | 1747831000006110 | Multiple sclerosis monitoring first letter                  |
| Multiple Sclerosis    | 1855101000006110 | Multiple sclerosis questionnaire completed                  |
| Multiple Sclerosis    | 1674121000000110 | Multiple sclerosis monitoring administration                |
| Multiple Sclerosis    | 1747851000006110 | Multiple sclerosis monitoring third letter                  |
| Multiple Sclerosis    | 1674971000000110 | Multiple sclerosis monitoring telephone invitation          |
| Multiple Sclerosis    | 699671000000115  | Management of multiple sclerosis in onset phase             |
| Multiple Sclerosis    | 41398015         | Multiple sclerosis  |
| Multiple Sclerosis    | 983311000006114  | Multiple sclerosis - relapsing remitting                    |
| Multiple Sclerosis    | 699791000000111  | Management of multiple sclerosis in stable disability phase |
| Multiple Sclerosis    | 905781000006118  | [RFC] Multiple sclerosis                                    |
| Multiple Sclerosis    | 1148911000000110 | Multiple sclerosis review declined                          |
| Multiple Sclerosis    | 983301000006111  | Multiple sclerosis - secondary progressive                  |
| Multiple Sclerosis    | 1682241000006110 | Relapsing remitting multiple sclerosis                      |
| Multiple Sclerosis    | 1747821000006110 | Multiple sclerosis monitoring administration                |
| Multiple Sclerosis    | 2692565012       | Primary progressive multiple sclerosis                      |
| Multiple Sclerosis    | 2674605012       | Secondary progressive multiple sclerosis                    |
| Multiple Sclerosis    | 699911000000117  | Management of multiple sclerosis in palliative phase        |
| Myocardial Infarction | 299708014        | Acute anteroapical infarction                               |
| Myocardial Infarction | 1786198013       | Thrombosis - coronary                                       |
| Myocardial Infarction | 362461000006119  | [X]Acute transmural myocardial infarction of unspecif site  |

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| Myocardial Infarction | 4775891000006110 | Acute myocardial infarction of atrium                   |
| Myocardial Infarction | 299712015        | True posterior myocardial infarction                    |
| Myocardial Infarction | 1218860015       | Acute papillary muscle infarction                       |
| Myocardial Infarction | 3452181000006110 | Acute myocardial infarction of lateral wall             |
| Myocardial Infarction | 299714019        | Acute myocardial infarction of inferior wall            |
| Myocardial Infarction | 3641641000006110 | Acute myocardial infarction of anterolateral wall       |
| Myocardial Infarction | 299707016        | Acute anterior myocardial infarction                    |
| Myocardial Infarction | 3784911000006110 | Acute myocardial infarction of septum                   |
| Myocardial Infarction | 299720018        | Other acute myocardial infarction NOS                   |
| Myocardial Infarction | 6651221000006110 | STEMI - ST elevation myocardial infarction              |
| Myocardial Infarction | 447324018        | Acute Q-wave infarct                                    |
| Myocardial Infarction | 1234005010       | Acute inferoposterior infarction                        |
| Myocardial Infarction | 299721019        | Acute myocardial infarction NOS                         |
| Myocardial Infarction | 450322013        | Acute non-Q wave infarction                             |
| Myocardial Infarction | 460681000006116  | Acute transmural myocardial infarction of unspecif site |
| Myocardial Infarction | 1780491019       | Acute ST segment elevation myocardial infarction        |
| Myocardial Infarction | 6348651000006110 | Myocardial infarction with complication                 |
| Myocardial Infarction | 967931000006114  | Acute myocardial infarction of posterolateral wall      |
| Myocardial Infarction | 2855351000006110 | Myocardial infarct                                      |
| Myocardial Infarction | 1786197015       | Coronary thrombosis                                     |
| Myocardial Infarction | 116992017        | Acute subendocardial infarction                         |
| Myocardial Infarction | 1234306015       | Acute septal infarction                                 |
| Myocardial Infarction | 905351000006113  | [RFC] Myocardial infarction (MI)                        |
| Myocardial Infarction | 219531000000117  | MI - acute myocardial infarction                        |
| Myocardial Infarction | 884151000006119  | Myocardial Infarction                                   |
| Myocardial Infarction | 299719012        | Acute atrial infarction                                 |

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|-----------------------|------------------|---|
| Myocardial Infarction | 2855311000006110 | Infarction of heart                                 |
| Myocardial Infarction | 932081000006118  | First myocardial infarction                         |
| Myocardial Infarction | 884141000006116  | Coronary thrombosis                                 |
| Myocardial Infarction | 5935321000006110 | Acute Q wave myocardial infarction                  |
| Myocardial Infarction | 94884017         | Acute myocardial infarction                         |
| Myocardial Infarction | 299710011        | Acute posterior myocardial infarction               |
| Myocardial Infarction | 299709018        | Anterior myocardial infarction NOS                  |
| Myocardial Infarction | 37443015         | Heart attack  |
| Myocardial Infarction | 3745741000006110 | Acute myocardial infarction of inferoposterior wall |
| Myocardial Infarction | 4775881000006110 | True posterior wall infarction                      |
| Myocardial Infarction | 455651000006114  | Acute anteroseptal myocardial infarction            |
| Myocardial Infarction | 3699911000006110 | Acute myocardial infarction of diaphragmatic wall   |
| Myocardial Infarction | 3381601000006110 | Acute myocardial infarction of anterior wall        |
| Myocardial Infarction | 3699921000006110 | Acute inferior myocardial infarction                |
| Myocardial Infarction | 299711010        | Acute lateral myocardial infarction                 |
| Myocardial Infarction | 6601131000006110 | CT - Coronary thrombosis                            |
| Myocardial Infarction | 6651391000006110 | NSTEMI - Non-ST segment elevation MI                |
| Myocardial Infarction | 2663441000006110 | Acute infarction of papillary muscle                |
| Myocardial Infarction | 299718016        | Other acute myocardial infarction                   |
| Myocardial Infarction | 2855321000006110 | Cardiac infarction                                  |
| Myocardial Infarction | 219521000000119  | Attack - heart                                      |
| Myocardial Infarction | 2855301000006110 | Myocardial infarction                               |
| Myocardial Infarction | 3427201000006110 | AMI - Acute myocardial infarction                   |
| Myocardial Infarction | 3645351000006110 | Acute nontransmural infarction                      |
| Myocardial Infarction | 455641000006112  | Acute anterolateral myocardial infarction           |
| Myocardial Infarction | 3784921000006110 | Acute myocardial infarction of septum alone         |

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| Myocardial Infarction | 3565871000006110  | Acute myocardial infarction of inferolateral wall                                     |
| Myocardial Infarction | 1780501013        | Acute non-ST segment elevation myocardial infarction                                  |
| Myocardial Infarction | 457531000006110   | Acute inferolateral myocardial infarction   |
| Myocardial Infarction | 2855341000006110  | MI - Myocardial infarction  |
| Myocardial Infarction | 3343471000006110  | Acute anteroapical myocardial infarction  |
| Peripheral Neuropathy | 7612281000006110  | Peripheral neuropathy due to chemotherapy   |
| Peripheral Neuropathy | 7813571000006110  | Polyneuropathy due to classical cystic fibrosis                                       |
| Peripheral Neuropathy | 8006651000006110  | Multiple cranial neuropathy   |
| Peripheral Neuropathy | 5009541000006110  | Diabetic distal sensorimotor polyneuropathy   |
| Peripheral Neuropathy | 5009841000006110  | Neuropathy due to infection   |
| Peripheral Neuropathy | 12185421000000000 | Polyneuropathy due to diabetes mellitus   |
| Peripheral Neuropathy | 7088831000006110  | History of ulnar entrapment neuropathy surgery  |
| Peripheral Neuropathy | 3506565014        | Bilateral ulnar neuropathy  |
| Peripheral Neuropathy | 12001691000000000 | Site, Ischemia, Neuropathy, Bacterial Infection and Depth classification total score  |
| Peripheral Neuropathy | 5912591000006110  | Neuropathy in secondary amyloidosis   |
| Peripheral Neuropathy | 55426011          | Idiopathic progressive polyneuropathy   |
| Peripheral Neuropathy | 913981000006115   | Insulin dependent diab mell with neuropathic arthropathy                              |
| Peripheral Neuropathy | 883161000006115   | Drug/toxic polyneuropathy   |
| Peripheral Neuropathy | 214921000006116   | Polyneuropathy in diabetes  |
| Peripheral Neuropathy | 3159821000006110  | Acute post-infective radiculoneuropathy   |
| Peripheral Neuropathy | 7844231000006110  | PHARC (polyneuropathy, hearing loss, ataxia, retinitis pigmentosa, cataract) syndrome |
| Peripheral Neuropathy | 5009741000006110  | Neuropathy in benign monoclonal gammopathy  |
| Peripheral Neuropathy | 2685631000006110  | Uremic neuropathy   |
| Peripheral Neuropathy | 4405321000006110  | Deep peroneal neuropathy  |
| Peripheral Neuropathy | 311114015         | Neuropathic spondylopathy   |
| Peripheral Neuropathy | 3352501000006110  | Sciatic neuropathy  |

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| Peripheral Neuropathy | 5009791000006110  | Multifocal motor neuropathy  |
| Peripheral Neuropathy | 7840751000006110  | Perioperative secondary non-arteritic ischaemic optic neuropathy                       |
| Peripheral Neuropathy | 7696801000006110  | Diabetic autonomic neuropathy due to type 2 diabetes mellitus                          |
| Peripheral Neuropathy | 6220801000006110  | Diabetic femoral mononeuropathy  |
| Peripheral Neuropathy | 2493341000000110  | Young Townson FootSkin Scale for Diabetic Neuropathy                                   |
| Peripheral Neuropathy | 38311000033119    | Treatment Of Diabetic Neuropathy   |
| Peripheral Neuropathy | 2825001000006110  | Plasma cell dyscrasia with polyneuropathy AND sclerotic bone lesions                   |
| Peripheral Neuropathy | 932681000006110   | Other peripheral neuropathy  |
| Peripheral Neuropathy | 7296981000006110  | CIDP (Chronic inflammatory demyelinating polyneuropathy)                               |
| Peripheral Neuropathy | 309179013         | Neuropathic diabetic ulcer - foot  |
| Peripheral Neuropathy | 7612271000006110  | Chemotherapy-induced peripheral neuropathy   |
| Peripheral Neuropathy | 3506302013        | Right suprascapular neuropathy   |
| Peripheral Neuropathy | 12344801000000000 | Lumbosacral radiculoplexus neuropathy co-occurrent and due to type 2 diabetes mellitus |
| Peripheral Neuropathy | 8362271000006110  | FootSkin Scale for Diabetic Neuropathy   |
| Peripheral Neuropathy | 913801000006118   | Insulin dependent diabetes mellitus with polyneuropathy                                |
| Peripheral Neuropathy | 70659018          | Polyneuropathy   |
| Peripheral Neuropathy | 12180781000000000 | Lumbosacral radiculoplexus neuropathy co-occurrent and due to diabetes mellitus        |
| Peripheral Neuropathy | 7868451000006110  | Spinocerebellar ataxia with axonal neuropathy type 2                                   |
| Peripheral Neuropathy | 3506411012        | Right common peroneal neuropathy   |
| Peripheral Neuropathy | 2477013014        | Swedish type amyloid polyneuropathy  |
| Peripheral Neuropathy | 5034001000006110  | Inflammatory facial neuropathy   |
| Peripheral Neuropathy | 4196491000006110  | Hypertrophic demyelinating neuropathy of infancy                                       |
| Peripheral Neuropathy | 8120381000006110  | Neuropathy due to type 2 diabetes mellitus   |
| Peripheral Neuropathy | 84941000006115    | Type II diabetes mellitus with neuropathic arthropathy                                 |
| Peripheral Neuropathy | 4428401000006110  | Ischaemic peripheral neuropathy  |
| Peripheral Neuropathy | 5086061000006110  | Hollow visceral neuropathy   |



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| Peripheral Neuropathy | 3506287018        | Left trigeminal neuropathy   |
| Peripheral Neuropathy | 3789131000006110  | Polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes (POEMS) syndrome |
| Peripheral Neuropathy | 12200241000000000 | Mononeuropathy simplex co-occurrent and due to diabetes mellitus                                       |
| Peripheral Neuropathy | 5149591000006110  | Syphilitic polyneuropathy  |
| Peripheral Neuropathy | 297575015         | Serum neuropathy   |
| Peripheral Neuropathy | 5009881000006110  | Neuropathy due to human immunodeficiency virus   |
| Peripheral Neuropathy | 8044171000006110  | Neuropathic toe ulcer due to type 2 diabetes mellitus  |
| Peripheral Neuropathy | 6047171000006110  | Drug induced optic neuropathy  |
| Peripheral Neuropathy | 366601000006119   | [X]Autonomic neuropathy/endocrine+metabolic diseases CE  |
| Peripheral Neuropathy | 345487013         | Diabetes mellitus with neuropathy  |
| Peripheral Neuropathy | 2980151000006110  | Niacin deficiency neuropathy   |
| Peripheral Neuropathy | 913771000006115   | Insulin dependent diabetes mellitus with mononeuropathy  |
| Peripheral Neuropathy | 3511407012        | Left leg peripheral neuropathy   |
| Peripheral Neuropathy | 8043161000006110  | Neuropathic ulcer of ankle   |
| Peripheral Neuropathy | 7751071000006110  | Acute inflammatory demyelinating polyradiculoneuropathy  |
| Peripheral Neuropathy | 3506380019        | Right superficial peroneal neuropathy  |
| Peripheral Neuropathy | 299366013         | [X]Other specified polyneuropathies  |
| Peripheral Neuropathy | 5009451000006110  | Chronic inflammatory demyelinating polyradiculoneuropathy with central nervous system demyelination    |
| Peripheral Neuropathy | 7668161000006110  | Peripheral neuropathy of upper limb due to infection   |
| Peripheral Neuropathy | 3743811000006110  | Postherpetic polyneuropathy  |
| Peripheral Neuropathy | 5008971000006110  | Non-arteritic ischemic optic neuropathy  |
| Peripheral Neuropathy | 2880691000006110  | Encephalomyeloneuropathy   |
| Peripheral Neuropathy | 143436010         | Idiopathic peripheral autonomic neuropathy   |
| Peripheral Neuropathy | 3733121000006110  | Amblyopia, neuropathy, orogenital dermatitis syndrome  |
| Peripheral Neuropathy | 82373015          | Diabetic polyneuropathy  |
| Peripheral Neuropathy | 345580013         | Intercostal neuropathy   |

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| Peripheral Neuropathy | 12000371000000000 | Autosomal recessive congenital hypomyelinating neuropathy                              |
| Peripheral Neuropathy | 12180771000000000 | Lumbosacral radiculoplexus neuropathy with diabetes mellitus                           |
| Peripheral Neuropathy | 3763431000006110  | Carcinomatous neuropathy   |
| Peripheral Neuropathy | 3636902019        | Chronic painful chemotherapy-induced polyneuropathy                                    |
| Peripheral Neuropathy | 12345471000000000 | Lumbosacral radiculoplexus neuropathy co-occurrent and due to type 1 diabetes mellitus |
| Peripheral Neuropathy | 2591251000006110  | Lower brachial plexus neuropathy   |
| Peripheral Neuropathy | 5010611000006110  | Idiopathic chronic neuropathy  |
| Peripheral Neuropathy | 2616811000006110  | Polyneuropathy due to drug   |
| Peripheral Neuropathy | 5008941000006110  | Arteritic ischaemic optic neuropathy   |
| Peripheral Neuropathy | 7781581000006110  | Spastic paraplegia due to NTE (neuropathy target esterase) mutation                    |
| Peripheral Neuropathy | 7056711000006110  | Sural neuropathy   |
| Peripheral Neuropathy | 3512059014        | Right leg peripheral neuropathy  |
| Peripheral Neuropathy | 12059391000000000 | Peripheral neuropathy due to and following chemotherapy                                |
| Peripheral Neuropathy | 297555012         | Polyneuropathy in vitamin B deficiency   |
| Peripheral Neuropathy | 913821000006111   | Type I diabetes mellitus with polyneuropathy   |
| Peripheral Neuropathy | 4693951000006110  | Infectious peripheral neuropathy   |
| Peripheral Neuropathy | 7483291000006110  | Symptomatic diabetic peripheral neuropathy absent                                      |
| Peripheral Neuropathy | 6600181000006110  | Portuguese type amyloid polyneuropathy   |
| Peripheral Neuropathy | 7612291000006110  | CIPN - Chemotherapy-induced peripheral neuropathy                                      |
| Peripheral Neuropathy | 3584531000006110  | Erythredema polyneuropathy   |
| Peripheral Neuropathy | 297566017         | Polyneuropathy in sarcoidosis  |
| Peripheral Neuropathy | 3483141000006110  | Lateral plantar neuropathy   |
| Peripheral Neuropathy | 7865891000006110  | Spastic paraplegia, optic atrophy, neuropathy syndrome                                 |
| Peripheral Neuropathy | 84531000006118    | Type 2 diabetes mellitus with mononeuropathy   |
| Peripheral Neuropathy | 8044241000006110  | Neuropathic foot ulcer due to type 2 diabetes mellitus                                 |
| Peripheral Neuropathy | 5009731000006110  | Neuropathy in cryoglobulinemia   |

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| Peripheral Neuropathy | 7704701000006110  | Polyneuropathy co-occurrent with human immunodeficiency virus infection      |
| Peripheral Neuropathy | 6962781000006110  | Vitamin B12 deficiency optic neuropathy                                      |
| Peripheral Neuropathy | 5009281000006110  | Compression facial neuropathy  |
| Peripheral Neuropathy | 12221151000000000 | Mononeuropathy co-occurrent and due to diabetes mellitus                     |
| Peripheral Neuropathy | 5009721000006110  | Neuropathy in cryoglobulinaemia  |
| Peripheral Neuropathy | 4060501000006110  | Motor peripheral neuropathy  |
| Peripheral Neuropathy | 459313016         | Type 2 diabetes mellitus with neuropathic arthropathy                        |
| Peripheral Neuropathy | 12013671000000000 | Autonomic neuropathy heart rate meter  |
| Peripheral Neuropathy | 215001000006114   | Polyneuropathy in mumps  |
| Peripheral Neuropathy | 5010041000006110  | Ischaemic neuropathy due to arterial steal                                   |
| Peripheral Neuropathy | 7781571000006110  | Spastic paraplegia due to neuropathy target esterase mutation                |
| Peripheral Neuropathy | 5009951000006110  | Ischemic neuropathy  |
| Peripheral Neuropathy | 3506285014        | Left sural neuropathy  |
| Peripheral Neuropathy | 3636927014        | Orofacial neuropathic pain   |
| Peripheral Neuropathy | 7844641000006110  | Peripheral neuropathy with sensorineural hearing impairment syndrome         |
| Peripheral Neuropathy | 7996341000006110  | Cranial neuropathy due to Herpes zoster                                      |
| Peripheral Neuropathy | 6702731000006110  | Acute compressive optic neuropathy   |
| Peripheral Neuropathy | 297571012         | Other toxic agent polyneuropathy   |
| Peripheral Neuropathy | 297558014         | Polyneuropathy in hypoglycaemia  |
| Peripheral Neuropathy | 297557016         | Polyneuropathy in herpes zoster  |
| Peripheral Neuropathy | 4405661000006110  | Congenital sensory neuropathy with selective loss of small myelinated fibers |
| Peripheral Neuropathy | 7032031000006110  | Diabetic peripheral neuropathy   |
| Peripheral Neuropathy | 71168014          | Peripheral neuropathy  |
| Peripheral Neuropathy | 297540015         | Polyneuropathy in collagen vascular disease                                  |
| Peripheral Neuropathy | 297530018         | Other idiopathic peripheral neuropathy NOS                                   |
| Peripheral Neuropathy | 3170381000006110  | Jewish type amyloid polyneuropathy   |

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| Peripheral Neuropathy | 297162010         | Idiopathic peripheral autonomic neuropathy NOS                          |
| Peripheral Neuropathy | 6702721000006110  | AION - anterior ischemic optic neuropathy                               |
| Peripheral Neuropathy | 2616831000006110  | Polyneuropathy caused by drug   |
| Peripheral Neuropathy | 771371000006118   | Insulin dependent diabetes mellitus with mononeuropathy                 |
| Peripheral Neuropathy | 297165012         | Disease related peripheral neuropathy                                   |
| Peripheral Neuropathy | 3384451000006110  | Neuropathy due to nutritional factors                                   |
| Peripheral Neuropathy | 6702711000006110  | AION - anterior ischaemic optic neuropathy                              |
| Peripheral Neuropathy | 12363241000000000 | Autonomic neuropathy co-occurrent and due to type 2 diabetes mellitus   |
| Peripheral Neuropathy | 5009551000006110  | Diabetic acute painful polyneuropathy                                   |
| Peripheral Neuropathy | 3128741000006110  | Diabetic lumbosacral radiculoplexus neuropathy                          |
| Peripheral Neuropathy | 305215013         | Reflex neuropathic bladder  |
| Peripheral Neuropathy | 12180921000000000 | Radiculoplexus neuropathy with diabetes mellitus                        |
| Peripheral Neuropathy | 3384441000006110  | Vitamin deficiency related neuropathy                                   |
| Peripheral Neuropathy | 6616881000006110  | Tibial neuropathy   |
| Peripheral Neuropathy | 3511413015        | Right arm peripheral neuropathy   |
| Peripheral Neuropathy | 772131000006111   | Insulin dependent diab mell with neuropathic arthropathy                |
| Peripheral Neuropathy | 12344811000000000 | Lumbosacral radiculoplexus neuropathy with type 2 diabetes mellitus     |
| Peripheral Neuropathy | 12010291000000000 | Microcephaly, complex motor and sensory axonal neuropathy syndrome      |
| Peripheral Neuropathy | 297569012         | Polyneuropathy in disease NOS   |
| Peripheral Neuropathy | 7501241000006110  | Compression neuropathy of ilioinguinal nerve                            |
| Peripheral Neuropathy | 399415018         | Mononeuropathy  |
| Peripheral Neuropathy | 7861631000006110  | Autonomic neuropathy due to sodium channelopathy                        |
| Peripheral Neuropathy | 450558019         | Polyneuropathy unspecified  |
| Peripheral Neuropathy | 3528107013        | Autonomic neuropathy due to metabolic disease                           |
| Peripheral Neuropathy | 7968941000006110  | Diabetic peripheral neuropathy associated with type 2 diabetes mellitus |
| Peripheral Neuropathy | 5009761000006110  | Neuropathy in monoclonal gammopathy of undetermined significance        |

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| Peripheral Neuropathy | 12363251000000000 | Autonomic neuropathy with type II diabetes mellitus                      |
| Peripheral Neuropathy | 12221131000000000 | Chronic painful polyneuropathy co-occurrent and due to diabetes mellitus |
| Peripheral Neuropathy | 3636486010        | Postvaccinal inflammatory neuropathy                                     |
| Peripheral Neuropathy | 3182611000006110  | Acquired polyneuropathy  |
| Peripheral Neuropathy | 6954121000006110  | Mononeuropathy associated with type II diabetes mellitus                 |
| Peripheral Neuropathy | 498448012         | Neuropathic foot ulcer   |
| Peripheral Neuropathy | 299360019         | Mononeuropathy of lower limb   |
| Peripheral Neuropathy | 6702701000006110  | Anterior ischemic optic neuropathy                                       |
| Peripheral Neuropathy | 280521000006117   | Non-insulin dependent diabetes mellitus with mononeuropathy              |
| Peripheral Neuropathy | 3506413010        | Left common peroneal neuropathy  |
| Peripheral Neuropathy | 5009701000006110  | Neuropathy in macroglobulinemia  |
| Peripheral Neuropathy | 12363731000000000 | Polyneuropathy co-occurrent and due to type 2 diabetes mellitus          |
| Peripheral Neuropathy | 2980141000006110  | Pellagra neuropathy  |
| Peripheral Neuropathy | 12363721000000000 | Polyneuropathy co-occurrent and due to type 1 diabetes mellitus          |
| Peripheral Neuropathy | 7764681000006110  | Optic neuropathy due to folate deficiency                                |
| Peripheral Neuropathy | 5009421000006110  | Congenital hypomyelinating neuropathy                                    |
| Peripheral Neuropathy | 52697011          | Mumps polyneuropathy   |
| Peripheral Neuropathy | 12180841000000000 | Symmetric proximal motor neuropathy with diabetes mellitus               |
| Peripheral Neuropathy | 3506383017        | Left median neuropathy   |
| Peripheral Neuropathy | 475273015         | Ulnar neuropathy   |
| Peripheral Neuropathy | 2685621000006110  | Uraemic neuropathy   |
| Peripheral Neuropathy | 359071000006116   | [X] Polyneuropathy, unspecified  |
| Peripheral Neuropathy | 3382751000006110  | Cervical root neuropathy   |
| Peripheral Neuropathy | 7308721000006110  | Paraneoplastic sensorimotor neuropathy                                   |
| Peripheral Neuropathy | 1235652010        | Van Allen type amyloid polyneuropathy                                    |
| Peripheral Neuropathy | 3345521000006110  | Niemann-Pick disease neuropathic type                                    |

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| Peripheral Neuropathy | 3791091000006110  | Neuropathic beriberi  |
| Peripheral Neuropathy | 345594014         | Axonal sensorimotor neuropathy  |
| Peripheral Neuropathy | 4405691000006110  | Chronic inflammatory demyelinating polyradiculoneuropathy   |
| Peripheral Neuropathy | 297552010         | Asymptomatic diabetic neuropathy  |
| Peripheral Neuropathy | 504101018         | Polyneuropathy in beriberi  |
| Peripheral Neuropathy | 297551015         | Chronic painful diabetic neuropathy   |
| Peripheral Neuropathy | 8112571000006110  | Idiopathic small fiber peripheral neuropathy  |
| Peripheral Neuropathy | 6600191000006110  | Japanese type amyloid polyneuropathy  |
| Peripheral Neuropathy | 1230890017        | Autonomic neuropathy due to diabetes  |
| Peripheral Neuropathy | 8034251000006110  | Neuropathic ulcer of midfoot AND/OR heel due to type 2 diabetes mellitus                                |
| Peripheral Neuropathy | 322645015         | Neuropathic foot blister  |
| Peripheral Neuropathy | 399418016         | Toxic or inflammatory neuropathy NOS  |
| Peripheral Neuropathy | 1772901000006110  | Critical illness polyneuropathy   |
| Peripheral Neuropathy | 675651000006110   | Neuropathic bladder   |
| Peripheral Neuropathy | 3563061000006110  | Adrenomyeloneuropathy   |
| Peripheral Neuropathy | 7769261000006110  | Polyneuropathy associated with monoclonal immunoglobulin M antibodies to myelin-associated glycoprotein |
| Peripheral Neuropathy | 459295013         | Type I diabetes mellitus with neuropathic arthropathy   |
| Peripheral Neuropathy | 12200251000000000 | Mononeuropathy simplex with diabetes mellitus   |
| Peripheral Neuropathy | 345519017         | Polyneuropathy in diphtheria  |
| Peripheral Neuropathy | 7609851000006110  | Neuropathy due to brittle type I diabetes mellitus  |
| Peripheral Neuropathy | 8021641000006110  | Ilioinguinal neuropathy   |
| Peripheral Neuropathy | 11812521000000000 | NAION - Non-arteritic ischemic optic neuropathy   |
| Peripheral Neuropathy | 2900061000006110  | SMON - subacute myelo-optico-neuropathy   |
| Peripheral Neuropathy | 81021000006113    | Uninhibited neuropathic bladder, NEC  |
| Peripheral Neuropathy | 3636918013        | Chronic central neuropathic pain  |
| Peripheral Neuropathy | 3273861000006110  | Allergic neuropathy   |

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| Peripheral Neuropathy | 8021631000006110  | Genitofemoral neuropathy  |
| Peripheral Neuropathy | 12342041000000000 | Peripheral neuropathy co-occurrent and due to diabetes mellitus |
| Peripheral Neuropathy | 9687241000006110  | Neuropathic pain caused by radiation                            |
| Peripheral Neuropathy | 5009481000006110  | Neuropathy due to vitamin B6 deficiency                         |
| Peripheral Neuropathy | 3506368010        | Left femoral neuropathy   |
| Peripheral Neuropathy | 84351000006117    | Type 1 diabetes mellitus with mononeuropathy                    |
| Peripheral Neuropathy | 9687231000006110  | Neuropathic pain due to radiation                               |
| Peripheral Neuropathy | 7499621000006110  | Common peroneal neuropathy at lateral popliteal branch          |
| Peripheral Neuropathy | 3239351000006110  | Compression neuropathy  |
| Peripheral Neuropathy | 369417015         | Neuropathic pain  |
| Peripheral Neuropathy | 3067511000006110  | Neuropathic leg ulcer   |
| Peripheral Neuropathy | 459312014         | Type II diabetes mellitus with neuropathic arthropathy          |
| Peripheral Neuropathy | 7644641000006110  | Peripheral neuropathy of upper limb caused by toxin             |
| Peripheral Neuropathy | 3506468014        | Left sciatic neuropathy   |
| Peripheral Neuropathy | 297544012         | Polyneuropathy in rheumatoid arthritis                          |
| Peripheral Neuropathy | 84421000006115    | Type 1 diabetes mellitus with polyneuropathy                    |
| Peripheral Neuropathy | 5009241000006110  | Idiopathic trigeminal neuropathy                                |
| Peripheral Neuropathy | 7696791000006110  | Diabetic autonomic neuropathy due to type 1 diabetes mellitus   |
| Peripheral Neuropathy | 5009931000006110  | Neuropathy caused by human immunodeficiency virus               |
| Peripheral Neuropathy | 6702691000006110  | Anterior ischaemic optic neuropathy                             |
| Peripheral Neuropathy | 2980171000006110  | Nicotinamide deficiency neuropathy                              |
| Peripheral Neuropathy | 5009681000006110  | Neuropathy due to multiple myeloma                              |
| Peripheral Neuropathy | 5848751000006110  | Obturator neuropathy  |
| Peripheral Neuropathy | 5009801000006110  | Neuropathy with anti-GM1 antibodies                             |
| Peripheral Neuropathy | 2743471000006110  | Alphalipoproteinemia neuropathy                                 |
| Peripheral Neuropathy | 3506471018        | Right sciatic neuropathy  |

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| Peripheral Neuropathy | 14103017          | Alcohol-induced polyneuropathy   |
| Peripheral Neuropathy | 7769271000006110  | Polyneuropathy associated with monoclonal IgM antibodies to myelin-associated glycoprotein |
| Peripheral Neuropathy | 12363221000000000 | Autonomic neuropathy with type I diabetes mellitus   |
| Peripheral Neuropathy | 5009661000006110  | Neuropathy associated with dysproteinaemias  |
| Peripheral Neuropathy | 5010051000006110  | Ischemic neuropathy due to arterial steal  |
| Peripheral Neuropathy | 3636903012        | Chronic painful polyneuropathy following chemotherapy                                      |
| Peripheral Neuropathy | 7000311000006110  | Entrapment neuropathy of upper limb  |
| Peripheral Neuropathy | 3513794017        | Polyneuropathy caused by ionising radiation  |
| Peripheral Neuropathy | 3513214015        | Left radial neuropathy   |
| Peripheral Neuropathy | 3512254010        | Bilateral peripheral neuropathy of upper limbs   |
| Peripheral Neuropathy | 5010091000006110  | Lead neuropathy  |
| Peripheral Neuropathy | 7668151000006110  | Neuropathy of upper limb due to infection  |
| Peripheral Neuropathy | 7809051000006110  | Cervical hypertrichosis and peripheral neuropathy syndrome                                 |
| Peripheral Neuropathy | 3506315016        | Right cervical root neuropathy   |
| Peripheral Neuropathy | 299373015         | [X]Polyneuropathy in other diseases classified elsewhere                                   |
| Peripheral Neuropathy | 4770641000006110  | Uraemic polyneuropathy   |
| Peripheral Neuropathy | 8008921000006110  | Paraneoplastic peripheral neuropathy   |
| Peripheral Neuropathy | 7306531000006110  | Neuropathy due to ionising radiation   |
| Peripheral Neuropathy | 297564019         | Polyneuropathy in porphyria  |
| Peripheral Neuropathy | 12363231000000000 | Autonomic neuropathy with type 2 diabetes mellitus   |
| Peripheral Neuropathy | 5904371000006110  | Polyneuropathy and mononeuropathy  |
| Peripheral Neuropathy | 2477015019        | Andrade type amyloid polyneuropathy  |
| Peripheral Neuropathy | 6974651000006110  | Polyneuropathy associated with AIDS  |
| Peripheral Neuropathy | 7609841000006110  | Neuropathy due to unstable diabetes mellitus type 1  |
| Peripheral Neuropathy | 6616951000006110  | Lateral popliteal neuropathy   |
| Peripheral Neuropathy | 3506318019        | Left cervical root neuropathy  |



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| Peripheral Neuropathy | 3523891000006110  | Congenital sensory neuropathy with anhidrosis                                     |
| Peripheral Neuropathy | 8034881000006110  | Peripheral sensory neuropathy due to type 2 diabetes mellitus                     |
| Peripheral Neuropathy | 8241041000006110  | Symptomatic diabetic peripheral neuropathy  |
| Peripheral Neuropathy | 3345491000006110  | Niemann-Pick disease, acute neuropathic form                                      |
| Peripheral Neuropathy | 3763421000006110  | Carcinomatous peripheral neuropathy   |
| Peripheral Neuropathy | 5605871000006110  | Autonomic neuropathy  |
| Peripheral Neuropathy | 3789111000006110  | Polyneuropathy organomegaly endocrinopathy monoclonal gammopathy and skin changes |
| Peripheral Neuropathy | 7689001000006110  | Severe infantile axonal neuropathy with respiratory failure                       |
| Peripheral Neuropathy | 297543018         | Polyneuropathy in polyarteritis nodosa  |
| Peripheral Neuropathy | 7861651000006110  | Immune mediated autonomic neuropathy  |
| Peripheral Neuropathy | 84601000006110    | Type 2 diabetes mellitus with polyneuropathy                                      |
| Peripheral Neuropathy | 12186011000000000 | Autonomic neuropathy with diabetes mellitus                                       |
| Peripheral Neuropathy | 3506340011        | Right trigeminal neuropathy   |
| Peripheral Neuropathy | 4405681000006110  | Peripheral axonal neuropathy  |
| Peripheral Neuropathy | 5009851000006110  | Diphtheritic neuropathy   |
| Peripheral Neuropathy | 12199281000000000 | Asymmetric proximal motor neuropathy co-occurrent and due to diabetes mellitus    |
| Peripheral Neuropathy | 5009751000006110  | Neuropathy in MGUS  |
| Peripheral Neuropathy | 422951000006111   | [X]Polyneuropathy in nutritional deficiency CE                                    |
| Peripheral Neuropathy | 12180761000000000 | DLRPN - diabetic lumbosacral radiculoplexus neuropathy                            |
| Peripheral Neuropathy | 7992451000006110  | Common peroneal neuropathy at the fibular head                                    |
| Peripheral Neuropathy | 8112561000006110  | Idiopathic small fibre peripheral neuropathy                                      |
| Peripheral Neuropathy | 136194012         | Nutritional optic neuropathy  |
| Peripheral Neuropathy | 5009271000006110  | Traumatic facial neuropathy   |
| Peripheral Neuropathy | 5009771000006110  | Motor neuropathy with multiple conduction block                                   |
| Peripheral Neuropathy | 7953161000006110  | Deafness, small bowel diverticulosis, neuropathy syndrome                         |
| Peripheral Neuropathy | 8286801000006110  | Education about diabetic neuropathy   |

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| Peripheral Neuropathy | 297554011         | Polyneuropathy in amyloidosis   |
| Peripheral Neuropathy | 4770431000006110  | Neuropathy in vasculitis and connective tissue disease                      |
| Peripheral Neuropathy | 12220661000000000 | Asymptomatic neuropathy co-occurrent and due to diabetes mellitus           |
| Peripheral Neuropathy | 8013531000006110  | Acute inflammatory demyelinating polyneuropathy                             |
| Peripheral Neuropathy | 5595781000006110  | Subacute inflammatory demyelinating polyradiculoneuropathy                  |
| Peripheral Neuropathy | 12702401000000000 | Mononeuropathy associated with type 2 diabetes mellitus                     |
| Peripheral Neuropathy | 12199291000000000 | Asymmetric proximal motor neuropathy with diabetes mellitus                 |
| Peripheral Neuropathy | 675631000006115   | Neuropathic arthritis   |
| Peripheral Neuropathy | 4405271000006110  | Phrenic neuropathy  |
| Peripheral Neuropathy | 4060471000006110  | Sensory neuropathy  |
| Peripheral Neuropathy | 5029011000006110  | Neuropathic corneal ulcer   |
| Peripheral Neuropathy | 2569961000006110  | Indiana-Maryland type amyloid polyneuropathy                                |
| Peripheral Neuropathy | 2717251000006110  | Sensory polyneuropathy  |
| Peripheral Neuropathy | 8103261000006110  | Polyneuropathy due to systemic sclerosis                                    |
| Peripheral Neuropathy | 422981000006115   | [X]Polyneuropathy/other musculoskeletal disorders CE                        |
| Peripheral Neuropathy | 2415191000000110  | Diabetic peripheral neuropathic pain  |
| Peripheral Neuropathy | 7840761000006110  | Perioperative secondary non-arteritic ischemic optic neuropathy             |
| Peripheral Neuropathy | 7668131000006110  | Neuropathy of upper limb due to inflammation                                |
| Peripheral Neuropathy | 5010271000006110  | Compression neuropathy of upper limb  |
| Peripheral Neuropathy | 422931000006116   | [X]Polyneuropathy in infectious+parasitic diseases CE                       |
| Peripheral Neuropathy | 7958851000006110  | AAION - arteritic anterior ischaemic optic neuropathy                       |
| Peripheral Neuropathy | 297550019         | Acute painful diabetic neuropathy   |
| Peripheral Neuropathy | 3791071000006110  | Thiamine deficiency neuropathy  |
| Peripheral Neuropathy | 7668021000006110  | Peripheral neuropathy of upper limb due to metabolic disorder               |
| Peripheral Neuropathy | 84391000006111    | Type 1 diabetes mellitus with neuropathic arthropathy                       |
| Peripheral Neuropathy | 12218471000000000 | Mixed sensorimotor polyneuropathy co-occurrent and due to diabetes mellitus |

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| Peripheral Neuropathy | 84761000006119    | Type I diabetes mellitus with neuropathic arthropathy                      |
| Peripheral Neuropathy | 7560791000006110  | Agenesis of corpus callosum with peripheral neuropathy                     |
| Peripheral Neuropathy | 5595791000006110  | Subacute idiopathic demyelinating polyradiculoneuropathy                   |
| Peripheral Neuropathy | 5279771000006110  | Peripheral neuropathic gait  |
| Peripheral Neuropathy | 4060481000006110  | Sensory peripheral neuropathy  |
| Peripheral Neuropathy | 7861581000006110  | Diabetic radiculoplexus neuropathy   |
| Peripheral Neuropathy | 2682251000006110  | Posterior sensory radicular neuropathy                                     |
| Peripheral Neuropathy | 4383621000006110  | Diabetic mixed sensory-motor polyneuropathy                                |
| Peripheral Neuropathy | 6204321000006110  | Diabetic neuropathy with neurologic complication                           |
| Peripheral Neuropathy | 881501000006110   | Diabetes + neuropathy  |
| Peripheral Neuropathy | 7857871000006110  | Peripheral neuropathy due to hypervitaminosis B6                           |
| Peripheral Neuropathy | 5009691000006110  | Neuropathy in macroglobulinaemia   |
| Peripheral Neuropathy | 5009671000006110  | Neuropathy associated with dysproteinemias                                 |
| Peripheral Neuropathy | 4770621000006110  | Sarcoid neuropathy   |
| Peripheral Neuropathy | 5009631000006110  | Neuropathy in acromegaly   |
| Peripheral Neuropathy | 6765431000006110  | Polyneuropathy in collagen malignant disease                               |
| Peripheral Neuropathy | 7830751000006110  | CEDNIK (cerebral dysgenesis, neuropathy, ichthyosis, keratoderma) syndrome |
| Peripheral Neuropathy | 7958861000006110  | Arteritic anterior ischemic optic neuropathy                               |
| Peripheral Neuropathy | 84721000006113    | Mononeuropathy with type 1 diabetes mellitus                               |
| Peripheral Neuropathy | 12331051000000000 | Mononeuropathy with type 2 diabetes mellitus                               |
| Peripheral Neuropathy | 12273061000000000 | Femoral mononeuropathy with diabetes mellitus                              |
| Peripheral Neuropathy | 422971000006118   | [X]Polyneuropathy/other endocrine+metabolic diseases CE                    |
| Peripheral Neuropathy | 1234144017        | Polyneuropathy in malignant disease  |
| Peripheral Neuropathy | 3835231000006110  | Optic neuropathy   |
| Peripheral Neuropathy | 5009921000006110  | Neuropathy caused by HIV - human immunodeficiency virus                    |
| Peripheral Neuropathy | 7047591000006110  | Vasculitic neuropathy  |

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| Peripheral Neuropathy | 12117351000000000 | Young Townson FootSkin Hydration Scale for Diabetic Neuropathy level   |
| Peripheral Neuropathy | 1235653017        | British type amyloid polyneuropathy  |
| Peripheral Neuropathy | 7306551000006110  | Neuropathy caused by ionising radiation  |
| Peripheral Neuropathy | 1013751000006110  | Adverse reaction to Treatment Of Diabetic Neuropathy   |
| Peripheral Neuropathy | 4383631000006110  | Diabetic motor polyneuropathy  |
| Peripheral Neuropathy | 4770501000006110  | Polyneuropathy associated with another disorder  |
| Peripheral Neuropathy | 3736781000006110  | Spastic paraplegia with hypertrophic sensory-motor neuropathy, type V  |
| Peripheral Neuropathy | 299359012         | Mononeuropathy of upper limb   |
| Peripheral Neuropathy | 12029811000000000 | Peripheral demyelinating neuropathy, central dysmyelinating leukodystrophy, Waardenburg syndrome, Hirschsprung disease |
| Peripheral Neuropathy | 12180851000000000 | Symmetric proximal motor neuropathy co-occurrent and due to diabetes mellitus  |
| Peripheral Neuropathy | 7687881000006110  | Autosomal recessive neuromyotonia with axonal neuropathy   |
| Peripheral Neuropathy | 7500781000006110  | Neuropathy of lower limb   |
| Peripheral Neuropathy | 5010511000006110  | Abdominal neuropathy   |
| Peripheral Neuropathy | 12363201000000000 | Autonomic neuropathy with type 1 diabetes mellitus   |
| Peripheral Neuropathy | 3506336019        | Right sural neuropathy   |
| Peripheral Neuropathy | 299375010         | Inflammatory polyneuropathy  |
| Peripheral Neuropathy | 2569981000006110  | German type amyloid polyneuropathy   |
| Peripheral Neuropathy | 914221000006113   | Type 2 diabetes mellitus with mononeuropathy   |
| Peripheral Neuropathy | 12370631000000000 | Peripheral neuropathy with type 1 diabetes mellitus  |
| Peripheral Neuropathy | 3512256012        | Peripheral neuropathy of both upper limbs  |
| Peripheral Neuropathy | 5010111000006110  | Neuropathy caused by bacterial toxin   |
| Peripheral Neuropathy | 914241000006118   | Polyneuropathy due to type 2 diabetes mellitus   |
| Peripheral Neuropathy | 913781000006117   | Type 1 diabetes mellitus with mononeuropathy   |
| Peripheral Neuropathy | 2980161000006110  | Niacinamide deficiency neuropathy  |
| Peripheral Neuropathy | 5009341000006110  | X-linked recessive sensory neuropathy  |
| Peripheral Neuropathy | 459296014         | Type 1 diabetes mellitus with neuropathic arthropathy  |

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| Peripheral Neuropathy | 12102491000000000 | Cervical radiculoplexus neuropathy co-occurrent and due to diabetes mellitus   |
| Peripheral Neuropathy | 7708121000006110  | Polyneuropathy due to diabetes mellitus type II                                |
| Peripheral Neuropathy | 11812531000000000 | NAION - Non-arteritic ischaemic optic neuropathy                               |
| Peripheral Neuropathy | 11826101000000000 | Optic neuropathy   |
| Peripheral Neuropathy | 214871000006114   | Polyneuropathy due to drugs  |
| Peripheral Neuropathy | 7958841000006110  | AAION - arteritic anterior ischemic optic neuropathy                           |
| Peripheral Neuropathy | 7668111000006110  | Neuropathy of upper limb due to inflammatory disease                           |
| Peripheral Neuropathy | 1724321000006110  | Neuropathic foot ulcer   |
| Peripheral Neuropathy | 6023421000006110  | Inherited optic neuropathy   |
| Peripheral Neuropathy | 3506391014        | Left superficial peroneal neuropathy   |
| Peripheral Neuropathy | 4403661000006110  | Polyradiculoneuropathy   |
| Peripheral Neuropathy | 422921000006119   | [X]Polyneuropathies and other disorders of the peripheral nervous system       |
| Peripheral Neuropathy | 913791000006119   | Type I diabetes mellitus with mononeuropathy                                   |
| Peripheral Neuropathy | 6897741000006110  | Compressive optic neuropathy due to thyroid eye disease                        |
| Peripheral Neuropathy | 6023471000006110  | Infiltrative optic neuropathy  |
| Peripheral Neuropathy | 914231000006111   | Type II diabetes mellitus with mononeuropathy                                  |
| Peripheral Neuropathy | 186191000006111   | Reflex neuropathic bladder, not elsewhere classified                           |
| Peripheral Neuropathy | 7814551000006110  | Infectious optic neuropathy  |
| Peripheral Neuropathy | 8021661000006110  | Ulnar neuropathy at wrist  |
| Peripheral Neuropathy | 84901000006117    | Mononeuropathy with type 2 diabetes mellitus                                   |
| Peripheral Neuropathy | 4392131000006110  | Diabetic sensory polyneuropathy  |
| Peripheral Neuropathy | 6936721000006110  | Amyloid cranial neuropathy with lattice corneal dystrophy                      |
| Peripheral Neuropathy | 5009511000006110  | Neuropathy associated with endocrine disorder                                  |
| Peripheral Neuropathy | 8004711000006110  | Noncompliant neuropathic bladder   |
| Peripheral Neuropathy | 3789121000006110  | POEMS - Polyneuropathy organomegaly endocrinopathy monoclonal and skin changes |
| Peripheral Neuropathy | 12008691000000000 | Hearing loss, encephaloneuropathy, obesity, valvulopathy syndrome              |

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| Peripheral Neuropathy | 12047921000000000 | ATP7A (ATPase copper transporting alpha) related distal motor neuropathy  |
| Peripheral Neuropathy | 6870941000006110  | Posterior ischaemic optic neuropathy  |
| Peripheral Neuropathy | 3239331000006110  | Entrapment neuropathy   |
| Peripheral Neuropathy | 5009441000006110  | Late congenital syphilitic polyneuropathy   |
| Peripheral Neuropathy | 12221181000000000 | Diabetic thoracic radiculoplexus neuropathy   |
| Peripheral Neuropathy | 7861571000006110  | Radiculoplexoneuropathy due to diabetes mellitus  |
| Peripheral Neuropathy | 7791741000006110  | X-linked auditory neuropathy with peripheral sensory neuropathy type 1  |
| Peripheral Neuropathy | 7834121000006110  | Optic neuropathy caused by ionising radiation following radiotherapy procedure  |
| Peripheral Neuropathy | 7704241000006110  | Neuropathy caused by isoniazid  |
| Peripheral Neuropathy | 8343301000006110  | DPNP - diabetic peripheral neuropathic pain   |
| Peripheral Neuropathy | 3791061000006110  | Beriberi neuropathy   |
| Peripheral Neuropathy | 12029831000000000 | PCWH - peripheral demyelinating neuropathy, central dysmyelinating leukodystrophy, Waardenburg syndrome, Hirschsprung disease |
| Peripheral Neuropathy | 6870961000006110  | PION - posterior ischemic optic neuropathy  |
| Peripheral Neuropathy | 12370391000000000 | Peripheral neuropathy co-occurrent and due to type 2 diabetes mellitus  |
| Peripheral Neuropathy | 3506323019        | Right axillary neuropathy   |
| Peripheral Neuropathy | 4428531000006110  | Hepatic neuropathy  |
| Peripheral Neuropathy | 215061000006110   | Polyneuropathy in uraemia   |
| Peripheral Neuropathy | 616451000006110   | Diabetes mellitus with polyneuropathy   |
| Peripheral Neuropathy | 2911061000006110  | Femoral neuropathy  |
| Peripheral Neuropathy | 3687281000006110  | Compressive optic neuropathy  |
| Peripheral Neuropathy | 5010081000006110  | Neuropathy caused by heavy metal  |
| Peripheral Neuropathy | 3245211000006110  | Nigerian neurogenic degenerative neuropathy   |
| Peripheral Neuropathy | 2727461000006110  | ION - Ischemic optic neuropathy   |
| Peripheral Neuropathy | 3506349012        | Bilateral sciatic neuropathy  |
| Peripheral Neuropathy | 3591841000006110  | Middle brachial plexus neuropathy   |
| Peripheral Neuropathy | 3584561000006110  | Erythroedema polyneuropathy   |

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| Peripheral Neuropathy | 2727451000006110  | ION - Ischaemic optic neuropathy   |
| Peripheral Neuropathy | 4742951000006110  | Vestibular neuropathy  |
| Peripheral Neuropathy | 4405621000006110  | Congenital sensory neuropathy with selective loss of small myelinated fibres   |
| Peripheral Neuropathy | 2900031000006110  | Subacute myelo-optic neuropathy  |
| Peripheral Neuropathy | 5009411000006110  | Congenital neuropathy with arthrogryposis multiplex congenita                  |
| Peripheral Neuropathy | 7560771000006110  | Agenesis of corpus callosum with polyneuropathy                                |
| Peripheral Neuropathy | 1978741000006110  | Neuropathic pain resolved  |
| Peripheral Neuropathy | 7283401000006110  | Auditory neuropathy spectrum disorder  |
| Peripheral Neuropathy | 12345481000000000 | Lumbosacral radiculoplexus neuropathy with type I diabetes mellitus            |
| Peripheral Neuropathy | 4410031000006110  | Retrobulbar neuropathy   |
| Peripheral Neuropathy | 2555511000006110  | Brachial plexus neuropathy   |
| Peripheral Neuropathy | 3159791000006110  | Acute inflammatory demyelinating polyradiculoneuropathy                        |
| Peripheral Neuropathy | 3636484013        | Inflammatory neuropathy due to and following vaccination                       |
| Peripheral Neuropathy | 3384461000006110  | Neuropathy due to deficiency syndrome  |
| Peripheral Neuropathy | 5010391000006110  | Compression neuropathy of lower limb   |
| Peripheral Neuropathy | 3236151000006110  | Toxic polyneuropathy   |
| Peripheral Neuropathy | 7830741000006110  | Cerebral dysgenesis, neuropathy, ichthyosis, palmoplantar keratoderma syndrome |
| Peripheral Neuropathy | 2504831000006110  | Secondary peripheral neuropathy  |
| Peripheral Neuropathy | 4770651000006110  | Uremic polyneuropathy  |
| Peripheral Neuropathy | 5989861000006110  | Symmetrical sensory neuropathy   |
| Peripheral Neuropathy | 4405311000006110  | Superficial peroneal nerve neuropathy  |
| Peripheral Neuropathy | 5009901000006110  | Human immunodeficiency virus neuropathy  |
| Peripheral Neuropathy | 2616821000006110  | Drug-related polyneuropathy  |
| Peripheral Neuropathy | 6755951000006110  | Drugs used in neuropathic pain   |
| Peripheral Neuropathy | 297164011         | Autonomic neuropathy due to amyloid  |
| Peripheral Neuropathy | 5009961000006110  | Neuropathy in arteriosclerotic occlusive disease                               |

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| Peripheral Neuropathy | 8320791000006110  | Pseudo-neuropathic pyrophosphate arthropathy   |
| Peripheral Neuropathy | 3129791000006110  | Symmetric diabetic proximal motor neuropathy   |
| Peripheral Neuropathy | 2555521000006110  | BPN - Brachial plexus neuropathy   |
| Peripheral Neuropathy | 7668171000006110  | Peripheral neuropathy due to metabolic disorder  |
| Peripheral Neuropathy | 7791621000006110  | Visceral neuropathy and brain anomaly with facial dysmorphism and developmental delay syndrome                 |
| Peripheral Neuropathy | 2561231000006110  | Mixed sensory-motor polyneuropathy   |
| Peripheral Neuropathy | 3230861000006110  | Intestinal autonomic neuropathy  |
| Peripheral Neuropathy | 12049761000000000 | Hypomyelination neuropathy arthrogyrosis syndrome  |
| Peripheral Neuropathy | 7734881000006110  | Chronic ataxic neuropathy, ophthalmoplegia, monoclonal IgM protein, cold agglutinins and disialosyl antibodies |
| Peripheral Neuropathy | 3506281017        | Left suprascapular neuropathy  |
| Peripheral Neuropathy | 5009401000006110  | Congenital polyneuropathy  |
| Peripheral Neuropathy | 2824991000006110  | Plasma cell dyscrasia with polyneuropathy  |
| Peripheral Neuropathy | 2743521000006110  | A - alphalipoproteinemia neuropathy  |
| Peripheral Neuropathy | 5009561000006110  | Diabetic chronic painful polyneuropathy  |
| Peripheral Neuropathy | 5010631000006110  | Demyelinating sensorimotor neuropathy  |
| Peripheral Neuropathy | 3506363018        | Left facial neuropathy   |
| Peripheral Neuropathy | 3159831000006110  | Acute inflammatory neuropathy  |
| Peripheral Neuropathy | 5008951000006110  | Arteritic ischemic optic neuropathy  |
| Peripheral Neuropathy | 7644631000006110  | Peripheral neuropathy caused by toxin  |
| Peripheral Neuropathy | 3888591000006110  | Motor polyneuropathy   |
| Peripheral Neuropathy | 5009611000006110  | Myxoedema neuropathy   |
| Peripheral Neuropathy | 12010381000000000 | Limbic encephalitis, neuromyotonia, hyperhidrosis, polyneuropathy syndrome                                     |
| Peripheral Neuropathy | 3515752018        | Chronic neuropathic pain   |
| Peripheral Neuropathy | 5010491000006110  | Compression neuropathy of trunk  |
| Peripheral Neuropathy | 7644651000006110  | Peripheral neuropathy due to inflammation  |
| Peripheral Neuropathy | 3245201000006110  | Tropical ataxic neuropathy   |



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| Peripheral Neuropathy | 12008681000000000 | Deafness, encephaloneuropathy, obesity, valvulopathy syndrome                                  |
| Peripheral Neuropathy | 5009571000006110  | Diabetic asymmetric polyneuropathy   |
| Peripheral Neuropathy | 297531019         | Hereditary or idiopathic peripheral neuropathy NOS   |
| Peripheral Neuropathy | 7708091000006110  | Polyneuropathy due to type 1 diabetes mellitus   |
| Peripheral Neuropathy | 5009021000006110  | Traumatic optic neuropathy   |
| Peripheral Neuropathy | 12185431000000000 | Polyneuropathy co-occurrent and due to diabetes mellitus                                       |
| Peripheral Neuropathy | 422991000006117   | [X]Polyneuropathy/systemic connective tissue disorders CE                                      |
| Peripheral Neuropathy | 84791000006110    | Polyneuropathy due to diabetes mellitus type I   |
| Peripheral Neuropathy | 5009981000006110  | Neuropathy in Buerger disease  |
| Peripheral Neuropathy | 1777779015        | Amyloid polyneuropathy type I  |
| Peripheral Neuropathy | 3528106016        | Autonomic neuropathy due to endocrine disease  |
| Peripheral Neuropathy | 5501261000006110  | Neuropathy in renal failure  |
| Peripheral Neuropathy | 6974661000006110  | AIDS with polyneuropathy (multiple nerve disease)  |
| Peripheral Neuropathy | 5009461000006110  | Inflammatory lumbosacral plexus neuropathy   |
| Peripheral Neuropathy | 281181000006116   | Non-insulin dependent diabetes mellitus with neuropathic arthropathy                           |
| Peripheral Neuropathy | 2873461000006110  | Demyelinating polyneuropathy   |
| Peripheral Neuropathy | 7501221000006110  | Compression neuropathy of genitofemoral nerve  |
| Peripheral Neuropathy | 4770601000006110  | Polyneuropathy in hypoglycemia   |
| Peripheral Neuropathy | 3789101000006110  | Polyneuropathy, organomegaly, endocrinopathy, monoclonal gammopathy, and skin changes syndrome |
| Peripheral Neuropathy | 7046731000006110  | Spastic neuropathic bladder  |
| Peripheral Neuropathy | 5010101000006110  | Neuropathy due to bacterial toxin  |
| Peripheral Neuropathy | 3503606012        | Radiation polyneuropathy   |
| Peripheral Neuropathy | 6870951000006110  | Posterior ischemic optic neuropathy  |
| Peripheral Neuropathy | 12180911000000000 | Radiculoplexus neuropathy co-occurrent and due to diabetes mellitus                            |
| Peripheral Neuropathy | 3118971000006110  | Upper brachial plexus neuropathy   |
| Peripheral Neuropathy | 99281000006115    | Toxic neuropathy, NOS  |

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| Peripheral Neuropathy | 211231000006113  | Post-herpetic polyneuropathy                               |
| Peripheral Neuropathy | 299362010        | [X]Other mononeuropathies in diseases classified elsewhere |
| Peripheral Neuropathy | 3359451000006110 | Neuropathic atrophy  |
| Peripheral Neuropathy | 5010061000006110 | Neuropathy caused by chemical substance                    |
| Peripheral Neuropathy | 5009471000006110 | Neuropathy due to folic acid deficiency                    |
| Peripheral Neuropathy | 5009321000006110 | Autosomal dominant sensory neuropathy                      |
| Peripheral Neuropathy | 5477461000006110 | Occult neuropathy  |
| Peripheral Neuropathy | 3763441000006110 | Paraneoplastic polyneuropathy                              |
| Peripheral Neuropathy | 3484061000006110 | Vitamin B>12< deficiency neuropathy                        |
| Peripheral Neuropathy | 3513793011       | Polyneuropathy caused by ionizing radiation                |
| Peripheral Neuropathy | 3506321017       | Left axillary neuropathy                                   |
| Peripheral Neuropathy | 8466941000006110 | Polyneuropathy due to infectious mononucleosis             |
| Peripheral Neuropathy | 4770541000006110 | Polyneuropathy due to vitamin B deficiency                 |
| Peripheral Neuropathy | 429721000006114  | [X]Uninhibited neuropathic bladder, NEC                    |
| Peripheral Neuropathy | 4428411000006110 | Ischemic peripheral neuropathy                             |
| Peripheral Neuropathy | 3636921010       | Chronic peripheral neuropathic pain                        |
| Peripheral Neuropathy | 5595761000006110 | Proximal median neuropathy                                 |
| Peripheral Neuropathy | 6962791000006110 | Optic neuropathy due to vitamin B12 deficiency             |
| Peripheral Neuropathy | 5009621000006110 | Myxedema neuropathy  |
| Peripheral Neuropathy | 3182621000006110 | Polyneuropathy (multiple nerve disorder)                   |
| Peripheral Neuropathy | 3420771000006110 | Nutritional ataxic neuropathy                              |
| Peripheral Neuropathy | 3319861000006110 | Diabetic autonomic neuropathy                              |
| Peripheral Neuropathy | 3511410017       | Left arm peripheral neuropathy                             |
| Peripheral Neuropathy | 7500791000006110 | Suprascapular neuropathy                                   |
| Peripheral Neuropathy | 84971000006111   | Type II diabetes mellitus with polyneuropathy              |
| Peripheral Neuropathy | 7519241000006110 | Neuropathy due to vitamin B12 deficiency                   |

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| Peripheral Neuropathy | 7861641000006110  | Autonomic neuropathy due to disorder of immune function        |
| Peripheral Neuropathy | 5010651000006110  | Chronic idiopathic ataxic neuropathy                           |
| Peripheral Neuropathy | 5098291000006110  | Neuropathic impotence  |
| Peripheral Neuropathy | 5009811000006110  | Anoxic neuropathy  |
| Peripheral Neuropathy | 11926791000000000 | Hereditary or idiopathic peripheral neuropathy NOS             |
| Peripheral Neuropathy | 5009491000006110  | Neuropathy due to vitamin E deficiency                         |
| Peripheral Neuropathy | 1978751000006110  | Persistent neuropathic pain                                    |
| Peripheral Neuropathy | 2626161000006110  | Alcoholic peripheral neuropathy                                |
| Peripheral Neuropathy | 6928101000006110  | Paraneoplastic optic neuropathy                                |
| Peripheral Neuropathy | 3506355019        | Right facial neuropathy  |
| Peripheral Neuropathy | 4770531000006110  | Amyloid polyneuropathy   |
| Peripheral Neuropathy | 5009431000006110  | Lyon's hypomyelinating neuropathy                              |
| Peripheral Neuropathy | 297511018         | Hereditary and idiopathic peripheral neuropathy                |
| Peripheral Neuropathy | 5010071000006110  | Neuropathy caused by organic substance                         |
| Peripheral Neuropathy | 913811000006115   | Type 1 diabetes mellitus with polyneuropathy                   |
| Peripheral Neuropathy | 5009971000006110  | Neuropathy in thromboangiitis obliterans                       |
| Peripheral Neuropathy | 7296971000006110  | Chronic inflammatory demyelinating polyneuropathy              |
| Peripheral Neuropathy | 6047161000006110  | Alcohol related optic neuropathy                               |
| Peripheral Neuropathy | 5009651000006110  | Neuropathy in blood dyscrasias                                 |
| Peripheral Neuropathy | 297542011         | Polyneuropathy in disseminated lupus erythematosus             |
| Peripheral Neuropathy | 493963018         | Swiss type amyloid polyneuropathy                              |
| Peripheral Neuropathy | 12220671000000000 | Asymptomatic neuropathy with diabetes mellitus                 |
| Peripheral Neuropathy | 5633101000006110  | Peripheral neuropathic pain                                    |
| Peripheral Neuropathy | 6977071000006110  | Hypertensive optic neuropathy                                  |
| Peripheral Neuropathy | 12186021000000000 | Autonomic neuropathy co-occurrent and due to diabetes mellitus |
| Peripheral Neuropathy | 4405281000006110  | Superficial peroneal neuropathy                                |

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| Peripheral Neuropathy | 3486151000006110  | Axonal neuropathy   |
| Peripheral Neuropathy | 500766011         | Neuropathic arthropathy   |
| Peripheral Neuropathy | 297545013         | Polyneuropathy in collagen vascular disease NOS                       |
| Peripheral Neuropathy | 7368021000006110  | Paraneoplastic sensory neuropathy                                     |
| Peripheral Neuropathy | 5010131000006110  | Injection neuropathy  |
| Peripheral Neuropathy | 2763961000006110  | Radial neuropathy   |
| Peripheral Neuropathy | 2727441000006110  | Ischemic optic neuropathy   |
| Peripheral Neuropathy | 6616941000006110  | Common peroneal neuropathy  |
| Peripheral Neuropathy | 6974671000006110  | Polyneuropathy associated with acquired immunodeficiency syndrome     |
| Peripheral Neuropathy | 6593461000006110  | Median neuropathy   |
| Peripheral Neuropathy | 6596771000006110  | Inherited dominant hypertrophic neuropathy                            |
| Peripheral Neuropathy | 345486016         | Diabetic neuropathy   |
| Peripheral Neuropathy | 297553017         | Polyneuropathy in disease EC  |
| Peripheral Neuropathy | 7846541000006110  | Length-dependent peripheral neuropathy                                |
| Peripheral Neuropathy | 6683701000006110  | Skin damage resulting from neuropathy                                 |
| Peripheral Neuropathy | 345492010         | Diabetic mononeuropathy   |
| Peripheral Neuropathy | 5009831000006110  | Critical illness-associated polyneuropathy                            |
| Peripheral Neuropathy | 4770571000006110  | Neuropathy associated with hypoglycaemia                              |
| Peripheral Neuropathy | 5010171000006110  | Lumbosacral plexus neuropathy   |
| Peripheral Neuropathy | 6047151000006110  | Tobacco related optic neuropathy                                      |
| Peripheral Neuropathy | 12363211000000000 | Autonomic neuropathy co-occurrent and due to type 1 diabetes mellitus |
| Peripheral Neuropathy | 8022481000006110  | Peripheral neuropathy due to type 1 diabetes mellitus                 |
| Peripheral Neuropathy | 4196431000006110  | Progressive hypertrophic interstitial neuropathy                      |
| Peripheral Neuropathy | 297574016         | Other toxic or inflammatory neuropathy                                |
| Peripheral Neuropathy | 3513210012        | Right radial neuropathy   |
| Peripheral Neuropathy | 6616891000006110  | Medial popliteal neuropathy   |

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| Peripheral Neuropathy | 7113421000006110  | Acute panautonomic neuropathy   |
| Peripheral Neuropathy | 299361015         | [X]Other specified mononeuropathies   |
| Peripheral Neuropathy | 6683661000006110  | Neuropathic ulcer   |
| Peripheral Neuropathy | 3076041000006110  | Diabetic mononeuropathy multiplex   |
| Peripheral Neuropathy | 2626141000006110  | Alcoholic polyneuropathy  |
| Peripheral Neuropathy | 299365012         | Inflammatory neuropathy   |
| Peripheral Neuropathy | 7734901000006110  | CANOMAD (chronic ataxic neuropathy, ophthalmoplegia, monoclonal IgM protein, cold agglutinins and disialosyl antibodies) syndrome |
| Peripheral Neuropathy | 4428511000006110  | Porphyric polyneuropathy  |
| Peripheral Neuropathy | 6053451000006110  | Pudendal nerve neuropathy   |
| Peripheral Neuropathy | 6591971000006110  | Acrodystrophic neuropathy   |
| Peripheral Neuropathy | 3791101000006110  | Neuropathy due to vitamin B1 deficiency   |
| Peripheral Neuropathy | 6962751000006110  | Mononeuropathy associated with type I diabetes mellitus   |
| Peripheral Neuropathy | 12491561000000000 | Diabetic radiculoplexus neuropathy  |
| Peripheral Neuropathy | 5009371000006110  | Tomaculous neuropathy   |
| Peripheral Neuropathy | 7958081000006110  | Leukoencephalopathy, dystonia, motor neuropathy syndrome  |
| Peripheral Neuropathy | 4770591000006110  | Neuropathy associated with hypoglycemia   |
| Peripheral Neuropathy | 6870971000006110  | PION - posterior ischaemic optic neuropathy   |
| Peripheral Neuropathy | 5848821000006110  | Thoracoabdominal neuropathy   |
| Peripheral Neuropathy | 7500951000006110  | Entrapment neuropathy of lower limb   |
| Peripheral Neuropathy | 12102501000000000 | Cervical radiculoplexus neuropathy with diabetes mellitus   |
| Peripheral Neuropathy | 7765301000006110  | Autosomal dominant optic atrophy and peripheral neuropathy syndrome   |
| Peripheral Neuropathy | 7758761000006110  | SANDO (sensory ataxic neuropathy dysarthria ophthalmoparesis) syndrome  |
| Peripheral Neuropathy | 7826481000006110  | MEDNIK (mental retardation, enteropathy, deafness, peripheral neuropathy, ichthyosis, keratoderma) syndrome                       |
| Peripheral Neuropathy | 280541000006112   | Non-insulin dependent diabetes mellitus with polyneuropathy   |
| Peripheral Neuropathy | 3830621000006110  | Diabetic mononeuropathy simplex   |
| Peripheral Neuropathy | 7283411000006110  | Auditory neuropathy with dys-synchrony  |

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| Peripheral Neuropathy | 4405801000006110  | Leprosy neuropathy   |
| Peripheral Neuropathy | 2743511000006110  | A - alphalipoproteinaemia neuropathy                                     |
| Peripheral Neuropathy | 7758751000006110  | Sensory ataxic neuropathy with dysarthria and ophthalmoparesis syndrome  |
| Peripheral Neuropathy | 7751051000006110  | Acute motor sensory axonal neuropathy                                    |
| Peripheral Neuropathy | 7650571000006110  | Small fiber neuropathy   |
| Peripheral Neuropathy | 5009641000006110  | Neuropathy in reticulosis/lymphoma                                       |
| Peripheral Neuropathy | 3506358017        | Right femoral neuropathy   |
| Peripheral Neuropathy | 7737391000006110  | Acute motor axonal neuropathy  |
| Peripheral Neuropathy | 5009911000006110  | HIV - Human immunodeficiency virus neuropathy                            |
| Peripheral Neuropathy | 12039231000000000 | Acute sensory ataxic neuropathy  |
| Peripheral Neuropathy | 299306010         | Paraneoplastic neuropathy  |
| Peripheral Neuropathy | 8022441000006110  | Neuropathic arthropathy due to type 1 diabetes mellitus                  |
| Peripheral Neuropathy | 851271000006111   | Compression neuropathy   |
| Peripheral Neuropathy | 989021000006118   | Other peripheral neuropathy  |
| Peripheral Neuropathy | 3791081000006110  | Vitamin B>1< deficiency neuropathy                                       |
| Peripheral Neuropathy | 12003961000000000 | Spastic paraplegia, neuropathy, poikiloderma syndrome                    |
| Peripheral Neuropathy | 7668011000006110  | Neuropathy of upper limb due to metabolic disorder                       |
| Peripheral Neuropathy | 12480111000000000 | [X]Polyneuropathies and other disorders of the peripheral nervous system |
| Peripheral Neuropathy | 3793811000006110  | Asymmetric diabetic proximal motor neuropathy                            |
| Peripheral Neuropathy | 7668121000006110  | Peripheral neuropathy of upper limb due to inflammatory disease          |
| Peripheral Neuropathy | 7989021000006110  | Neuropathic arthropathy of wrist   |
| Peripheral Neuropathy | 7968951000006110  | Diabetic peripheral neuropathy associated with type II diabetes mellitus |
| Peripheral Neuropathy | 2743541000006110  | Alphalipoproteinaemia neuropathy   |
| Peripheral Neuropathy | 12331061000000000 | Mononeuropathy co-occurrent and due to type 2 diabetes mellitus          |
| Peripheral Neuropathy | 297528015         | Idiopathic peripheral neuropathy   |
| Peripheral Neuropathy | 43776019          | Toxic optic neuropathy   |

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| Peripheral Neuropathy | 8462831000006110  | Polyneuropathy due to cytomegaloviral mononucleosis                            |
| Peripheral Neuropathy | 7500771000006110  | Neuropathy of upper limb   |
| Peripheral Neuropathy | 7834141000006110  | Radiation induced optic neuropathy following radiotherapy procedure            |
| Peripheral Neuropathy | 399416017         | Inflammatory and toxic neuropathy  |
| Peripheral Neuropathy | 914251000006116   | Type II diabetes mellitus with polyneuropathy                                  |
| Peripheral Neuropathy | 2796941000006110  | Hypertrophic interstitial neuropathy   |
| Peripheral Neuropathy | 7857881000006110  | Peripheral neuropathy due to vitamin B6 hyperalimentation                      |
| Peripheral Neuropathy | 7519251000006110  | Neuropathy due to vitamin B deficiency   |
| Peripheral Neuropathy | 4060491000006110  | Peripheral motor neuropathy  |
| Peripheral Neuropathy | 5096681000006110  | Neuropathic vesicoureteric reflux  |
| Peripheral Neuropathy | 12010281000000000 | Microcephalus, complex motor and sensory axonal neuropathy syndrome            |
| Peripheral Neuropathy | 12370381000000000 | Peripheral neuropathy with type 2 diabetes                                     |
| Peripheral Neuropathy | 7687871000006110  | Autosomal recessive axonal neuropathy with neuromyotonia                       |
| Peripheral Neuropathy | 771401000006115   | Insulin dependent diabetes mellitus with polyneuropathy                        |
| Peripheral Neuropathy | 7958831000006110  | Arteritic anterior ischaemic optic neuropathy                                  |
| Peripheral Neuropathy | 5008961000006110  | Non-arteritic ischaemic optic neuropathy                                       |
| Peripheral Neuropathy | 12059401000000000 | CIPN - Chemotherapy-induced peripheral neuropathy                              |
| Peripheral Neuropathy | 6989611000006110  | Facial neuropathy  |
| Peripheral Neuropathy | 7834131000006110  | Optic neuropathy caused by ionizing radiation following radiotherapy procedure |
| Peripheral Neuropathy | 778621000006116   | Inflammatory polyneuropathy, unspecified                                       |
| Peripheral Neuropathy | 8022461000006110  | Diabetic neuropathic arthropathy due to type 1 diabetes mellitus               |
| Peripheral Neuropathy | 12102511000000000 | CRPN - diabetic cervical radiculoplexus neuropathy                             |
| Peripheral Neuropathy | 7863831000006110  | Polyneuropathy with systemic connective tissue disorder                        |
| Peripheral Neuropathy | 7500841000006110  | Sural neuropathy (calf)  |
| Peripheral Neuropathy | 7306541000006110  | Neuropathy due to ionizing radiation   |
| Peripheral Neuropathy | 12039251000000000 | ASAN - acute sensory ataxic neuropathy   |

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| Peripheral Neuropathy | 7844221000006110  | Polyneuropathy, hearing loss, ataxia, retinitis pigmentosa, cataract syndrome   |
| Peripheral Neuropathy | 6449091000006110  | Neuropathy (nerve damage)   |
| Peripheral Neuropathy | 3506374010        | Right median neuropathy   |
| Peripheral Neuropathy | 8032081000006110  | Sensory neuropathy due to type 1 diabetes mellitus  |
| Peripheral Neuropathy | 8030901000006110  | Neuropathic arthropathy of shoulder   |
| Peripheral Neuropathy | 8022491000006110  | Peripheral neuropathy co-occurrent and due to type 1 diabetes mellitus  |
| Peripheral Neuropathy | 7826471000006110  | Intellectual disability, enteropathy, deafness, peripheral neuropathy, ichthyosis, keratoderma syndrome   |
| Peripheral Neuropathy | 12702371000000000 | Mononeuropathy associated with type 1 diabetes mellitus   |
| Peripheral Neuropathy | 5009781000006110  | MMN - Motor neuropathy with multiple conduction block   |
| Peripheral Neuropathy | 12332761000000000 | Mononeuropathy co-occurrent and due to type 1 diabetes mellitus   |
| Peripheral Neuropathy | 3687701000006110  | Cranial neuropathy  |
| Peripheral Neuropathy | 12332751000000000 | Mononeuropathy with type 1 diabetes mellitus  |
| Peripheral Neuropathy | 422941000006114   | [X]Polyneuropathy in neoplastic disease CE  |
| Peripheral Neuropathy | 7863821000006110  | Polyneuropathy co-occurrent and due to systemic connective tissue disorder  |
| Peripheral Neuropathy | 7844251000006110  | Peripheral neuropathy Fiskerstrand type   |
| Peripheral Neuropathy | 2873451000006110  | Peripheral demyelinating neuropathy   |
| Peripheral Neuropathy | 7857961000006110  | Neuropathy due to nutritional deficiency<br>Chronic ataxic neuropathy, ophthalmoplegia, monoclonal immunoglobulin M protein, cold agglutinin and disialosyl antibody syndrome |
| Peripheral Neuropathy | 7734871000006110  | Moebius syndrome, axonal neuropathy, hypogonadotropic hypogonadism syndrome   |
| Peripheral Neuropathy | 7849441000006110  | Neuropathic hypohidrosis  |
| Peripheral Neuropathy | 4405671000006110  | Giant axonal neuropathy   |
| Peripheral Neuropathy | 7500831000006110  | Sural neuropathy in calf  |
| Peripheral Neuropathy | 7734891000006110  | Chronic sensory ataxic neuropathy with anti-dyalosyl IgM antibodies   |
| Peripheral Neuropathy | 4428541000006110  | Neuropathy in liver disease   |
| Peripheral Neuropathy | 12273051000000000 | Femoral mononeuropathy co-occurrent and due to diabetes mellitus  |
| Peripheral Neuropathy | 7074541000006110  | Flaccid neuropathic bladder   |



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| Peripheral Neuropathy | 297563013         | Polyneuropathy in pellagra   |
| Peripheral Neuropathy | 7102261000006110  | History of entrapment neuropathy surgery                               |
| Peripheral Neuropathy | 12221141000000000 | Asymmetric polyneuropathy co-occurrent and due to diabetes mellitus    |
| Peripheral Neuropathy | 7865901000006110  | SPOAN (spastic paraplegia, optic atrophy, neuropathy) syndrome         |
| Peripheral Neuropathy | 12221121000000000 | Acute painful polyneuropathy co-occurrent and due to diabetes mellitus |
| Peripheral Neuropathy | 12221111000000000 | Neuropathy co-occurrent and due to diabetes mellitus                   |
| Peripheral Neuropathy | 84571000006115    | Type 2 diabetes mellitus with neuropathic arthropathy                  |
| Peripheral Neuropathy | 7011021000006110  | Acute herpes zoster neuropathy   |
| Peripheral Neuropathy | 2645721000006110  | Iowa type amyloid polyneuropathy                                       |
| Peripheral Neuropathy | 476238012         | Ischaemic optic neuropathy   |
| Peripheral Neuropathy | 5009891000006110  | Neuropathy due to HIV - human immunodeficiency virus                   |
| Peripheral Neuropathy | 3236171000006110  | Polyneuropathy due to toxic agents                                     |
| Peripheral Neuropathy | 7844651000006110  | Neuropathy with hearing impairment                                     |
| Peripheral Neuropathy | 299364011         | [X]Other hereditary and idiopathic neuropathies                        |
| Peripheral Neuropathy | 12218491000000000 | Sensory neuropathy co-occurrent and due to diabetes mellitus           |
| Peripheral Neuropathy | 12218481000000000 | Motor polyneuropathy co-occurrent and due to diabetes mellitus         |
| Peripheral Neuropathy | 4405711000006110  | CIDP - Chronic inflammatory demyelinating polyradiculoneuropathy       |
| Peripheral Neuropathy | 883171000006110   | Other peripheral neuropathy  |
| Peripheral Neuropathy | 12345461000000000 | Lumbosacral radiculoplexus neuropathy with type 1 diabetes mellitus    |
| Peripheral Neuropathy | 5009941000006110  | Ischaemic neuropathy   |
| Peripheral Neuropathy | 8053211000006110  | Neuropathic arthropathy of pelvis                                      |
| Peripheral Neuropathy | 1672021000006110  | Axonal sensorimotor neuropathy   |
| Peripheral Neuropathy | 12725511000000000 | Hereditary or idiopathic peripheral neuropathy NOS                     |
| Peripheral Neuropathy | 7650561000006110  | Small fibre neuropathy   |
| Peripheral Neuropathy | 12180901000000000 | DRPN - diabetic radiculoplexus neuropathy                              |
| Peripheral Neuropathy | 1786083014        | Neuropathic bladder  |

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| Peripheral Neuropathy       | 7560681000006110  | Congenital cataracts, facial dysmorphism and neuropathy                   |
| Peripheral Neuropathy       | 12026151000000000 | Spinocerebellar ataxia with axonal neuropathy type 1                      |
| Peripheral Neuropathy       | 7966911000006110  | Diabetic neuropathic arthropathy associated with type 2 diabetes mellitus |
| Peripheral Neuropathy       | 7306561000006110  | Neuropathy caused by ionizing radiation                                   |
| Peripheral Neuropathy       | 7560691000006110  | CCFDN - congenital cataracts, facial dysmorphism and neuropathy           |
| Peripheral Neuropathy       | 4808921000006110  | Diabetic neuropathic arthropathy  |
| Peripheral Neuropathy       | 399821000006115   | Neuropathy  |
| Peripheral Neuropathy       | 3523841000006110  | Swanson-Buchanan-Alvord neuropathy syndrome                               |
| Peripheral Neuropathy       | 12491551000000000 | Radiculoplexoneuropathy due to diabetes mellitus                          |
| Peripheral Vascular Disease | 470121011         | Syphilitic aortic aneurysm  |
| Peripheral Vascular Disease | 239511000006111   | Percutaneous transluminal angioplasty of subclavian artery                |
| Peripheral Vascular Disease | 105536013         | Intermittent claudication   |
| Peripheral Vascular Disease | 530201000006110   | Bypass of iliac artery by anastomosis of iliac artery to femoral artery   |
| Peripheral Vascular Disease | 272036015         | Ligation of aneurysm of popliteal artery                                  |
| Peripheral Vascular Disease | 151487012         | Aneurysm of femoral artery  |
| Peripheral Vascular Disease | 458503018         | Juxtarenal aortic aneurysm  |
| Peripheral Vascular Disease | 272032018         | Open thrombectomy of femoral artery                                       |
| Peripheral Vascular Disease | 216185010         | Peripheral vascular disease monitoring                                    |
| Peripheral Vascular Disease | 271868010         | Other bypass of iliac artery NOS  |
| Peripheral Vascular Disease | 1823971000006110  | Peripheral arterial disease confirmed                                     |

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| Peripheral<br>Vascular<br>Disease | 458504012        | Inflammatory abdominal aortic aneurysm  |
| Peripheral<br>Vascular<br>Disease | 530821000006116  | Bypass popliteal artery by pop/pop a anast c vein graft NEC   |
| Peripheral<br>Vascular<br>Disease | 349674016        | Emergency replacement of aneurysmal popliteal artery  |
| Peripheral<br>Vascular<br>Disease | 2231891000000110 | Peripheral vascular disease monitoring second letter  |
| Peripheral<br>Vascular<br>Disease | 300968014        | [X]Aneurysm of aorta in diseases classified elsewhere   |
| Peripheral<br>Vascular<br>Disease | 280561000006111  | Non-insulin-dependent diabetes mellitus with peripheral angiopathy  |
| Peripheral<br>Vascular<br>Disease | 530151000006118  | Bypass femoral artery by fem/tib art anast c prosthesis NEC   |
| Peripheral<br>Vascular<br>Disease | 4666411000006110 | AAA - Repair of abdominal aortic aneurysm using bifurcation graft   |
| Peripheral<br>Vascular<br>Disease | 300445011        | Ruptured aortic aneurysm  |
| Peripheral<br>Vascular<br>Disease | 300556014        | Embolism and thrombosis of the iliac artery unspecified   |
| Peripheral<br>Vascular<br>Disease | 8043961000006110 | History of endovascular stent graft for repair of abdominal aortic aneurysm   |
| Peripheral<br>Vascular<br>Disease | 359211000000113  | Endovascular stenting of aortic bifurcation NEC   |
| Peripheral<br>Vascular<br>Disease | 1967531000006110 | NHS abdominal aortic aneurysm screening programme initial screening shows abdominal aortic aneurysm, placed on surveillance programme |
| Peripheral<br>Vascular<br>Disease | 300554012        | Embolism and/or thrombosis of the internal iliac artery   |
| Peripheral<br>Vascular<br>Disease | 300540016        | Embolism and thrombosis of the popliteal artery   |
| Peripheral<br>Vascular<br>Disease | 300514010        | Other specified peripheral vascular disease NOS   |
| Peripheral<br>Vascular<br>Disease | 443199013        | Ischaemic foot  |

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| Peripheral<br>Vascular<br>Disease | 616441000006113  | Peripheral vascular disorder due to diabetes mellitus                               |
| Peripheral<br>Vascular<br>Disease | 460686018        | [V]Presence of aortocoronary bypass graft   |
| Peripheral<br>Vascular<br>Disease | 300441019        | Abdominal aortic aneurysm   |
| Peripheral<br>Vascular<br>Disease | 359851000000113  | Repair of suprarenal abdominal aortic aneurysm with insertion of endovascular stent |
| Peripheral<br>Vascular<br>Disease | 1715241000006110 | Vascular claudication   |
| Peripheral<br>Vascular<br>Disease | 111949011        | Aortic aneurysm   |
| Peripheral<br>Vascular<br>Disease | 349667014        | Other emergency bypass of femoral artery  |
| Peripheral<br>Vascular<br>Disease | 300446012        | Thoracoabdominal aortic aneurysm, ruptured  |
| Peripheral<br>Vascular<br>Disease | 530111000006119  | Bypass femoral artery by fem/peron a anast c prosthesis NEC                         |
| Peripheral<br>Vascular<br>Disease | 349693019        | Tube graft of Abdominal aortic aneurysm   |
| Peripheral<br>Vascular<br>Disease | 375462013        | Claudication distance   |
| Peripheral<br>Vascular<br>Disease | 459308015        | Type 2 diabetes mellitus with peripheral angiopathy                                 |
| Peripheral<br>Vascular<br>Disease | 300460014        | Aneurysm of common iliac artery   |
| Peripheral<br>Vascular<br>Disease | 742481000006118  | Ischaemic leg   |
| Peripheral<br>Vascular<br>Disease | 410965018        | Endarterectomy of common iliac artery   |
| Peripheral<br>Vascular<br>Disease | 272055015        | Percutaneous transluminal embolectomy of femoral artery                             |
| Peripheral<br>Vascular<br>Disease | 349662015        | Popliteal-distal bypass   |

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| Peripheral Vascular Disease | 530161000006116  | Bypass of femoral artery by anastomosis of femoral artery to tibial artery using vein graft |
| Peripheral Vascular Disease | 411512011        | Claudication  |
| Peripheral Vascular Disease | 292523015        | Diabetes mellitus NOS with peripheral circulatory disorder                                  |
| Peripheral Vascular Disease | 2377911000000110 | Ischaemic foot pain when walking  |
| Peripheral Vascular Disease | 173711000006118  | Replacement of aneurysmal bifurcation of aorta OS   |
| Peripheral Vascular Disease | 80421013         | Aneurysm of popliteal artery  |
| Peripheral Vascular Disease | 458507017        | Popliteal artery occlusion  |
| Peripheral Vascular Disease | 271430018        | Replacement of aneurysmal bifurcation of aorta NOS  |
| Peripheral Vascular Disease | 394339014        | Arterial bypass of lower limb artery  |
| Peripheral Vascular Disease | 456363010        | Percutaneous transluminal angioplasty of vascular graft                                     |
| Peripheral Vascular Disease | 239491000006117  | Percutaneous angioplasty of popliteal artery  |
| Peripheral Vascular Disease | 458502011        | Ruptured suprarenal aortic aneurysm   |
| Peripheral Vascular Disease | 1221083011       | Abdominal aortic aneurysm which has ruptured  |
| Peripheral Vascular Disease | 458505013        | Iliac artery occlusion  |
| Peripheral Vascular Disease | 300539018        | Embolism and thrombosis of the femoral artery   |
| Peripheral Vascular Disease | 1548341000006110 | Percutaneous transluminal insertion of stent into femoral artery                            |
| Peripheral Vascular Disease | 271456013        | Emergency replacement of aneurysmal segment of aorta NOS                                    |

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| Peripheral<br>Vascular<br>Disease | 530141000006115  | Bypass of femoral artery by anastomosis of femoral artery to popliteal artery using vein graft |
| Peripheral<br>Vascular<br>Disease | 530791000006113  | Bypass popliteal artery by pop/fem artery anastomosis NEC                                      |
| Peripheral<br>Vascular<br>Disease | 395791015        | Other peripheral vascular disease  |
| Peripheral<br>Vascular<br>Disease | 350540014        | Upper limb ischaemia   |
| Peripheral<br>Vascular<br>Disease | 325063014        | Peripheral vascular complications of care  |
| Peripheral<br>Vascular<br>Disease | 235911000006116  | Peripheral vascular disease  |
| Peripheral<br>Vascular<br>Disease | 530781000006110  | Bypass popliteal art by pop/peron art anast c vein graft NEC                                   |
| Peripheral<br>Vascular<br>Disease | 4666401000006110 | Repair of aortic aneurysm using bifurcation graft  |
| Peripheral<br>Vascular<br>Disease | 272014018        | Endarterectomy of popliteal artery   |
| Peripheral<br>Vascular<br>Disease | 173691000006116  | Replacement of aneurysmal bifurcation of aorta   |
| Peripheral<br>Vascular<br>Disease | 22740018         | Aneurysm of iliac artery   |
| Peripheral<br>Vascular<br>Disease | 272035016        | Open embolectomy popliteal artery  |
| Peripheral<br>Vascular<br>Disease | 272003016        | Other bypass of femoral artery or popliteal artery NOS   |
| Peripheral<br>Vascular<br>Disease | 2377871000000110 | Ischaemic foot pain at rest  |
| Peripheral<br>Vascular<br>Disease | 2231911000000110 | Peripheral vascular disease monitoring third letter  |
| Peripheral<br>Vascular<br>Disease | 741071000000112  | Peripheral vascular disease monitoring invitation  |
| Peripheral<br>Vascular<br>Disease | 300961015        | [X]Aortic aneurysm of unspecified site, nonruptured  |

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| Peripheral<br>Vascular<br>Disease | 750511000000117  | Endovascular insertion of stent for aorto-uniiliac aneurysm   |
| Peripheral<br>Vascular<br>Disease | 300510018        | Other specified peripheral vascular disease   |
| Peripheral<br>Vascular<br>Disease | 639881000006115  | Emergency replacement of aneurysmal popliteal artery by anastomosis of popliteal artery to femoral artery |
| Peripheral<br>Vascular<br>Disease | 300960019        | [X]Aortic aneurysm of unspecified site, ruptured  |
| Peripheral<br>Vascular<br>Disease | 1728191000006110 | Infrarenal abdominal aortic aneurysm  |
| Peripheral<br>Vascular<br>Disease | 300442014        | AAA - Abdominal aortic aneurysm without mention of rupture  |
| Peripheral<br>Vascular<br>Disease | 488301000006118  | Aortic aneurysm - syphilitic  |
| Peripheral<br>Vascular<br>Disease | 1696201000006110 | Peripheral vascular disease annual review   |
| Peripheral<br>Vascular<br>Disease | 5049891000006110 | AAA - Repair of abdominal aortic aneurysm using straight graft  |
| Peripheral<br>Vascular<br>Disease | 309177010        | Ischaemic ulcer diabetic foot   |
| Peripheral<br>Vascular<br>Disease | 530131000006113  | Bypass of femoral artery by anastomosis of femoral artery to popliteal artery using prosthesis            |
| Peripheral<br>Vascular<br>Disease | 300448013        | Thoracoabdominal aortic aneurysm  |
| Peripheral<br>Vascular<br>Disease | 36061000006118   | Other bypass of femoral artery or popliteal artery OS   |
| Peripheral<br>Vascular<br>Disease | 349664019        | Other bypass of deep femoral artery   |
| Peripheral<br>Vascular<br>Disease | 1548161000006110 | Repair of infrarenal abdominal aortic aneurysm with insertion of endovascular stent                       |
| Peripheral<br>Vascular<br>Disease | 300447015        | Aortic aneurysm without mention of rupture NOS  |
| Peripheral<br>Vascular<br>Disease | 300464017        | Aneurysm of internal iliac artery   |

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| Peripheral<br>Vascular<br>Disease | 359071000000111  | Percutaneous transluminal angioplasty of vein                  |
| Peripheral<br>Vascular<br>Disease | 349678018        | Aortic aneurysm repair   |
| Peripheral<br>Vascular<br>Disease | 1847121000006110 | Peripheral arterial disease                                    |
| Peripheral<br>Vascular<br>Disease | 350535018        | Peripheral ischaemic vascular disease                          |
| Peripheral<br>Vascular<br>Disease | 300515011        | Peripheral vascular disease NOS                                |
| Peripheral<br>Vascular<br>Disease | 272034017        | Open thrombectomy of popliteal artery                          |
| Peripheral<br>Vascular<br>Disease | 2536174018       | Dissecting aortic aneurysm                                     |
| Peripheral<br>Vascular<br>Disease | 350533013        | Peripheral ischaemia   |
| Peripheral<br>Vascular<br>Disease | 3733811000006110 | Abdominal aortic aneurysm without rupture                      |
| Peripheral<br>Vascular<br>Disease | 394307019        | Other replacement of aneurysmal segment of aorta               |
| Peripheral<br>Vascular<br>Disease | 272017013        | Profundoplasty of femoral artery NEC                           |
| Peripheral<br>Vascular<br>Disease | 271447017        | Emergency repair of aortic aneurysm                            |
| Peripheral<br>Vascular<br>Disease | 1701701000006110 | Endovascular insertion of stent for suprarenal aortic aneurysm |
| Peripheral<br>Vascular<br>Disease | 300433019        | Extremity artery atheroma                                      |
| Peripheral<br>Vascular<br>Disease | 349694013        | Tube graft abdominal aortic aneurysm - emergency               |
| Peripheral<br>Vascular<br>Disease | 161481000006112  | Aortocoronary artery bypass graft with saphenous vein graft    |
| Peripheral<br>Vascular<br>Disease | 450665015        | Ischaemic toe  |



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| Peripheral<br>Vascular<br>Disease | 300449017        | Leaking abdominal aortic aneurysm   |
| Peripheral<br>Vascular<br>Disease | 8009281000006110 | Limb ischaemia  |
| Peripheral<br>Vascular<br>Disease | 349663013        | Femoral artery bypass   |
| Peripheral<br>Vascular<br>Disease | 300466015        | Aneurysm of iliac artery NOS  |
| Peripheral<br>Vascular<br>Disease | 1701731000006110 | Endovas insert stent for aortic aneurysm of bifurcation NEC   |
| Peripheral<br>Vascular<br>Disease | 7515621000006110 | Elective repair of infrarenal abdominal aortic aneurysm   |
| Peripheral<br>Vascular<br>Disease | 456362017        | Prosthetic graft patch angioplasty  |
| Peripheral<br>Vascular<br>Disease | 488221000000111  | Abdominal aortic aneurysm stenting  |
| Peripheral<br>Vascular<br>Disease | 6057441000006110 | Repair of thoracoabdominal aortic aneurysm  |
| Peripheral<br>Vascular<br>Disease | 302011           | Diabetic peripheral angiopathy  |
| Peripheral<br>Vascular<br>Disease | 357895013        | Ischaemic leg ulcer   |
| Peripheral<br>Vascular<br>Disease | 640221000006110  | Emergency replacement of aneurysmal segment of aorta OS   |
| Peripheral<br>Vascular<br>Disease | 1967541000006110 | NHS abdominal aortic aneurysm screening programme initial screening shows large abdominal aortic aneurysm, referred to vascular service |
| Peripheral<br>Vascular<br>Disease | 1701691000006110 | Endovascular insertion of stent for infrarenal abdominal aortic aneurysm  |
| Peripheral<br>Vascular<br>Disease | 349665018        | Other bypass of common femoral artery   |
| Peripheral<br>Vascular<br>Disease | 271905011        | Insertion of iliac artery stent   |
| Peripheral<br>Vascular<br>Disease | 5049881000006110 | Repair of aortic aneurysm using straight graft  |

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| Peripheral<br>Vascular<br>Disease | 271446014        | Emergency replacement of aneurysmal segment of aorta                 |
| Peripheral<br>Vascular<br>Disease | 272052017        | Percutaneous transluminal angioplasty of femoral artery              |
| Peripheral<br>Vascular<br>Disease | 530191000006112  | Bypass iliac artery by femoral/femoral art anastomosis NEC           |
| Peripheral<br>Vascular<br>Disease | 1587751000006110 | Endovascular insertion of stent graft for suprarenal aortic aneurysm |
| Peripheral<br>Vascular<br>Disease | 451376017        | H/O: Peripheral vascular disease procedure                           |
| Peripheral<br>Vascular<br>Disease | 357894012        | Arterial leg ulcer   |
| Peripheral<br>Vascular<br>Disease | 7294891000006110 | Endovascular repair of abdominal aortic aneurysm                     |
| Peripheral<br>Vascular<br>Disease | 5058071000006110 | Lower limb ischaemia   |
| Peripheral<br>Vascular<br>Disease | 884571000006119  | Atherosclerosis of extremities                                       |
| Peripheral<br>Vascular<br>Disease | 741131000000114  | Peripheral vascular disease monitoring first letter                  |
| Peripheral<br>Vascular<br>Disease | 300450017        | Aortic aneurysm NOS  |
| Peripheral<br>Vascular<br>Disease | 272031013        | Open embolectomy of femoral artery                                   |
| Peripheral<br>Vascular<br>Disease | 884601000006114  | Abdominal aortic aneurysm  |
| Peripheral<br>Vascular<br>Disease | 5058441000006110 | AAA - Abdominal aortic aneurysm                                      |
| Peripheral<br>Vascular<br>Disease | 1795071000000110 | Aortic aneurysm monitoring   |
| Peripheral<br>Vascular<br>Disease | 251699010        | H/O: aortic aneurysm   |
| Peripheral<br>Vascular<br>Disease | 394323019        | Iliac artery bypass  |

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| Peripheral<br>Vascular<br>Disease | 410960011        | Y graft abdominal Aortic aneurysm                             |
| Peripheral<br>Vascular<br>Disease | 349689013        | Y graft of abdominal aortic aneurysm - emergency              |
| Peripheral<br>Vascular<br>Disease | 24379014         | Ruptured abdominal aortic aneurysm                            |
| Peripheral<br>Vascular<br>Disease | 394322012        | Replacement of aneurysmal iliac artery                        |
| Peripheral<br>Vascular<br>Disease | 394329015        | Endarterectomy of iliac artery                                |
| Peripheral<br>Vascular<br>Disease | 1696221000006110 | Peripheral vascular disease monitoring first letter           |
| Peripheral<br>Vascular<br>Disease | 394338018        | Other emergency bypass of femoral artery or popliteal artery  |
| Peripheral<br>Vascular<br>Disease | 300553018        | Embolism and/or thrombosis of the common iliac artery         |
| Peripheral<br>Vascular<br>Disease | 458506014        | Femoral artery occlusion                                      |
| Peripheral<br>Vascular<br>Disease | 271900018        | Percutaneous transluminal angioplasty of iliac artery         |
| Peripheral<br>Vascular<br>Disease | 884661000006110  | Peripheral arterial embolism                                  |
| Peripheral<br>Vascular<br>Disease | 488231000000113  | Endovascular stenting for aorto-uniiliac aneurysm             |
| Retinal<br>Detachment             | 6768001000006110 | Retinopathy of prematurity stage 5 - total retinal detachment |
| Retinal<br>Detachment             | 297752013        | Retinal detachment  |
| Retinal<br>Detachment             | 7702731000006110 | Partial retinal detachment                                    |
| Retinal<br>Detachment             | 8014461000006110 | Recent retinal detachment                                     |
| Retinal<br>Detachment             | 3177931000006110 | Detached retina   |
| Retinal<br>Detachment             | 2556251000006110 | Partial recent retinal detachment with single defect          |
| Retinal<br>Detachment             | 3177921000006110 | RD - Retinal detachment                                       |
| Retinal<br>Detachment             | 7691731000006110 | Rhegmatogenous retinal detachment due to retinal dialysis     |

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| Retinal Detachment | 5030551000006110 | Macular traction retinal detachment  |
| Retinal Detachment | 8106451000006110 | Total retinal detachment   |
| Retinal Detachment | 297732012        | Retinal detachment with defect NOS   |
| Retinal Detachment | 7691691000006110 | Retinal detachment with single break   |
| Retinal Detachment | 8210061000006110 | Detachment of left retina co-occurrent with retinal defect                       |
| Retinal Detachment | 7691711000006110 | Retinal detachment with multiple breaks  |
| Retinal Detachment | 169841000006116  | Retinal detachment with break  |
| Retinal Detachment | 7577511000006110 | Retinal detachment and occipital encephalocoele                                  |
| Retinal Detachment | 3411071000006110 | Ophthalmoscopy with medical evaluation, extended, for retinal detachment mapping |
| Retinal Detachment | 297727011        | Recent total retinal detachment  |
| Retinal Detachment | 5240271000006110 | Status of macula in subtotal retinal detachment                                  |
| Retinal Detachment | 297722017        | Unspecified retinal detachment with retinal defect                               |
| Retinal Detachment | 297728018        | Recent subtotal retinal detachment   |
| Retinal Detachment | 5030611000006110 | Solid retinal detachment   |
| Retinal Detachment | 399429017        | Retinal detachments and defects  |
| Retinal Detachment | 5030521000006110 | Rhegmatogenous retinal detachment - macula on                                    |
| Retinal Detachment | 7430001000006110 | Retinal detachment implant   |
| Retinal Detachment | 1228202019       | Traction retinal detachment  |
| Retinal Detachment | 3193681000006110 | Partial recent retinal detachment with giant tear                                |
| Retinal Detachment | 297723010        | New partial retinal detachment with single defect                                |
| Retinal Detachment | 297750017        | Other forms of retinal detachment  |
| Retinal Detachment | 8210071000006110 | Right retinal detachment co-occurrent with retinal defect                        |
| Retinal Detachment | 3121381000006110 | Exudative retinal detachment   |
| Retinal Detachment | 5030541000006110 | Traction retinal detachment involving macula                                     |
| Retinal Detachment | 7691721000006110 | Rhegmatogenous retinal detachment with multiple breaks                           |
| Retinal Detachment | 3342691000006110 | Retinal detachment without retinal defect  |

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| Retinal Detachment | 7577521000006110  | Retinal detachment and occipital encephalocele                   |
| Retinal Detachment | 65007012          | Serous retinal detachment  |
| Retinal Detachment | 11786821000000000 | Detachment of right retina co-occurrent with retinal defect      |
| Retinal Detachment | 5240251000006110  | Retinal detachment - subretinal fluid                            |
| Retinal Detachment | 299475014         | [X]Other retinal detachments                                     |
| Retinal Detachment | 297751018         | Other retinal detachments NOS                                    |
| Retinal Detachment | 3058851000006110  | TRD - Traction retinal detachment                                |
| Retinal Detachment | 3121111000006110  | Partial recent retinal detachment with retinal dialysis          |
| Retinal Detachment | 7691701000006110  | Rhegmatogenous retinal detachment with single break              |
| Retinal Detachment | 6767991000006110  | Retinopathy of prematurity stage 4 - subtotal retinal detachment |
| Retinal Detachment | 2565621000006110  | Partial recent retinal detachment with multiple defects          |
| Retinal Detachment | 11878691000000000 | Retinal detachment due to full thickness retinal tear            |
| Retinal Detachment | 5030531000006110  | Rhegmatogenous retinal detachment - macula off                   |
| Retinal Detachment | 5030771000006110  | Diabetic traction retinal detachment                             |
| Retinal Detachment | 5030571000006110  | Combined traction and rhegmatogenous retinal detachment          |
| Retinal Detachment | 297725015         | New partial retinal detachment with giant tear defect            |
| Retinal Detachment | 883231000006118   | Retinal detachment/defects                                       |
| Retinal Detachment | 2811481000006110  | Rhegmatogenous retinal detachment                                |
| Retinal Detachment | 3058831000006110  | Traction detachment of retina                                    |
| Retinal Detachment | 3413171000006110  | Retinal detachment with retinal defect                           |
| Retinal Detachment | 297726019         | New partial retinal detachment with retinal dialysis             |
| Retinal Detachment | 3177951000006110  | Sensory retinal detachment                                       |
| Retinal Detachment | 11904451000000000 | Retinal detachments and defects                                  |
| Retinal Detachment | 11924841000000000 | New partial retinal detachment with giant tear defect            |
| Retinal Detachment | 297724016         | New partial retinal detachment with multiple defects             |
| Retinal Detachment | 12728141000000000 | Retinal detachment NOS   |

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| Retinal Detachment   | 5030561000006110 | Traction retinal detachment sparing macula   |
| Rheumatoid Arthritis | 219021000000114  | Rheumatoid arthritis monitoring  |
| Rheumatoid Arthritis | 8440071000006110 | Rheumatoid arthritis monitoring SMS (short message service) text message third invitation  |
| Rheumatoid Arthritis | 116082011        | Rheumatoid arthritis   |
| Rheumatoid Arthritis | 309792019        | Rheumatoid arthritis of elbow  |
| Rheumatoid Arthritis | 989311000006111  | Rheum. arth. - hip joint   |
| Rheumatoid Arthritis | 162341000006115  | Rheumatoid nodule  |
| Rheumatoid Arthritis | 1778239014       | Rheumatoid lung disease  |
| Rheumatoid Arthritis | 123542016        | Pauciarticular juvenile rheumatoid arthritis   |
| Rheumatoid Arthritis | 989331000006117  | Rheum. arth. - ankle/foot  |
| Rheumatoid Arthritis | 1880371000006110 | Rheumatoid arthritis resolved  |
| Rheumatoid Arthritis | 8447281000006110 | Rheumatoid arthritis of right knee   |
| Rheumatoid Arthritis | 1932121000006110 | 3D study - problems with rheumatoid arthritis management                                   |
| Rheumatoid Arthritis | 309804018        | Rheumatoid arthritis of talonavicular joint  |
| Rheumatoid Arthritis | 309805017        | Rheumatoid arthritis of other tarsal joint   |
| Rheumatoid Arthritis | 2640821000000110 | Rheumatoid Arthritis Impact of Disease questionnaire score                                 |
| Rheumatoid Arthritis | 309803012        | Rheumatoid arthritis of subtalar joint   |
| Rheumatoid Arthritis | 309816012        | Flare of rheumatoid arthritis  |
| Rheumatoid Arthritis | 8440051000006110 | Rheumatoid arthritis monitoring SMS (short message service) text message second invitation |
| Rheumatoid Arthritis | 424981000006114  | [X]Rheumatoid arthritis+involvement/other organs or systems                                |
| Rheumatoid Arthritis | 1779323014       | Rheumatoid vasculitis  |
| Rheumatoid Arthritis | 309788014        | Rheumatoid arthritis of spine  |
| Rheumatoid Arthritis | 485614018        | Rheumatoid nodule  |
| Rheumatoid Arthritis | 989291000006112  | Rheum. arth. - wrist joint   |
| Rheumatoid Arthritis | 1875581000006110 | Rheumatoid arthritis monitoring verbal invitation  |
| Rheumatoid Arthritis | 312518013        | [X]Other seropositive rheumatoid arthritis   |

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| Rheumatoid Arthritis | 889811000006114  | Rheum. arth. - shoulder joint   |
| Rheumatoid Arthritis | 162231000006117  | Rheumatoid arthropathy + visceral/systemic involvement NOS                                |
| Rheumatoid Arthritis | 309828016        | Juvenile rheumatoid arthritis NOS   |
| Rheumatoid Arthritis | 889781000006112  | Rheum. arth. - hand joint   |
| Rheumatoid Arthritis | 309827014        | Monarticular juvenile rheumatoid arthritis  |
| Rheumatoid Arthritis | 889731000006111  | Rheumatoid arthritis NOS  |
| Rheumatoid Arthritis | 309824019        | Juvenile rheumatoid arthropathy unspecified   |
| Rheumatoid Arthritis | 297544012        | Polyneuropathy in rheumatoid arthritis  |
| Rheumatoid Arthritis | 309802019        | Rheumatoid arthritis of ankle   |
| Rheumatoid Arthritis | 309800010        | Rheumatoid arthritis of knee  |
| Rheumatoid Arthritis | 989321000006115  | Rheum. arth. - knee joint   |
| Rheumatoid Arthritis | 8045661000006110 | Rheumatoid arthritis in remission   |
| Rheumatoid Arthritis | 371261000000111  | Delivery of rehabilitation for rheumatoid arthritis                                       |
| Rheumatoid Arthritis | 2472447010       | Juvenile rheumatoid arthritis   |
| Rheumatoid Arthritis | 889741000006118  | Rheum. arth. - other joint  |
| Rheumatoid Arthritis | 1786545019       | Rheumatoid lung   |
| Rheumatoid Arthritis | 2839291014       | Disease activity score 28 joint in rheumatoid arthritis                                   |
| Rheumatoid Arthritis | 989301000006113  | Rheum. arth. - hand joint   |
| Rheumatoid Arthritis | 2275671000000110 | Rheumatoid arthritis monitoring invitation first letter                                   |
| Rheumatoid Arthritis | 162301000006117  | Rheumatoid lung   |
| Rheumatoid Arthritis | 162131000006111  | Rheumatoid arthritis of proximal interphalangeal joint of finger                          |
| Rheumatoid Arthritis | 2530001000006110 | Chronic polyarticular juvenile rheumatoid arthritis                                       |
| Rheumatoid Arthritis | 8440041000006110 | Rheumatoid arthritis monitoring SMS (short message service) text message first invitation |
| Rheumatoid Arthritis | 1875591000006110 | Rheumatoid arthritis monitoring invitation first letter                                   |
| Rheumatoid Arthritis | 309789018        | Rheumatoid arthritis of shoulder  |
| Rheumatoid Arthritis | 297641010        | Myopathy due to rheumatoid arthritis  |

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| Rheumatoid Arthritis | 162041000006117  | Rheumatoid arthritis of distal interphalangeal joint of finger                           |
| Rheumatoid Arthritis | 149911000006117  | Seropositive rheumatoid arthritis  |
| Rheumatoid Arthritis | 8440031000006110 | Rheumatoid arthritis monitoring invitation by SMS (short message service) text messaging |
| Rheumatoid Arthritis | 162101000006115  | Rheumatoid arthritis of lesser metatarsophalangeal joint                                 |
| Rheumatoid Arthritis | 251794010        | H/O: rheumatoid arthritis  |
| Rheumatoid Arthritis | 162111000006117  | Rheumatoid arthritis of metacarpophalangeal joint  |
| Rheumatoid Arthritis | 162081000006111  | Rheumatoid arthritis of interphalangeal joint of toe                                     |
| Rheumatoid Arthritis | 300221014        | Rheumatoid myocarditis   |
| Rheumatoid Arthritis | 3636551000006110 | Rheumatoid disease   |
| Rheumatoid Arthritis | 162051000006115  | Rheumatoid arthritis of distal radio-ulnar joint   |
| Rheumatoid Arthritis | 162191000006110  | Rheumatoid arthritis of tibio-fibular joint  |
| Rheumatoid Arthritis | 1875611000006110 | Rheumatoid arthritis monitoring invitation third letter                                  |
| Rheumatoid Arthritis | 311496011        | Fibrosing alveolitis associated with rheumatoid arthritis                                |
| Rheumatoid Arthritis | 8187311000006110 | Assessment of rheumatoid arthritis using DAS28 (disease activity score 28)               |
| Rheumatoid Arthritis | 48361011         | Rheumatoid carditis  |
| Rheumatoid Arthritis | 889771000006114  | Rheum. arth. - hip joint   |
| Rheumatoid Arthritis | 909191000006119  | [RFC] Rheumatoid arthritis   |
| Rheumatoid Arthritis | 312534011        | [X]Seropositive rheumatoid arthritis, unspecified  |
| Rheumatoid Arthritis | 1875601000006110 | Rheumatoid arthritis monitoring invitation second letter                                 |
| Rheumatoid Arthritis | 125937016        | Acute polyarticular juvenile rheumatoid arthritis  |
| Rheumatoid Arthritis | 312520011        | [X]Other specified rheumatoid arthritis  |
| Rheumatoid Arthritis | 309790010        | Rheumatoid arthritis of sternoclavicular joint   |
| Rheumatoid Arthritis | 2275501000000110 | Rheumatoid arthritis monitoring invitation   |
| Rheumatoid Arthritis | 2275711000000110 | Rheumatoid arthritis monitoring invitation second letter                                 |
| Rheumatoid Arthritis | 309794018        | Rheumatoid arthritis of wrist  |
| Rheumatoid Arthritis | 168751000006115  | Rheumatoid arthritis and other inflammatory polyarthropathy                              |



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| Rheumatoid Arthritis | 889751000006116  | Rheum. arth. - ankle/foot                                     |
| Rheumatoid Arthritis | 16911000006114   | Rheumatoid arthritis with organ / system involvement          |
| Rheumatoid Arthritis | 1875561000006110 | Rheumatoid arthritis monitoring invitation                    |
| Rheumatoid Arthritis | 451461014        | Seropositive erosive rheumatoid arthritis                     |
| Rheumatoid Arthritis | 2275831000000110 | Rheumatoid arthritis monitoring telephone invitation          |
| Rheumatoid Arthritis | 2275751000000110 | Rheumatoid arthritis monitoring invitation third letter       |
| Rheumatoid Arthritis | 2275791000000110 | Rheumatoid arthritis monitoring verbal invitation             |
| Rheumatoid Arthritis | 5721431000006110 | Rheumatoid arthritis of multiple joints                       |
| Rheumatoid Arthritis | 889761000006119  | Rheum. arth. - knee joint                                     |
| Rheumatoid Arthritis | 4809101000006110 | Rheumatoid arthritis of distal radioulnar joint               |
| Rheumatoid Arthritis | 426510015        | Rheumatoid arthritis - multiple joint                         |
| Rheumatoid Arthritis | 4809221000006110 | Rheumatoid arthritis of first metatarsophalangeal joint       |
| Rheumatoid Arthritis | 168761000006118  | Rheumatoid arthritis of 1st metatarsophalangeal joint         |
| Rheumatoid Arthritis | 309812014        | Rheumatoid bursitis   |
| Rheumatoid Arthritis | 309798015        | Rheumatoid arthritis of hip                                   |
| Rheumatoid Arthritis | 889791000006110  | Rheum. arth. - wrist joint                                    |
| Rheumatoid Arthritis | 889821000006118  | Rheum. arth. - multiple joint                                 |
| Rheumatoid Arthritis | 2196791000000110 | Rheumatoid arthritis annual review                            |
| Rheumatoid Arthritis | 7282111000006110 | DAS (disease activity score) 28 joint in rheumatoid arthritis |
| Rheumatoid Arthritis | 309791014        | Rheumatoid arthritis of acromioclavicular joint               |
| Rheumatoid Arthritis | 162141000006118  | Rheumatoid arthritis of sacroiliac joint                      |
| Rheumatoid Arthritis | 889801000006111  | Rheum. arth. - elbow joint                                    |
| Rheumatoid Arthritis | 755441000006119  | Juvenile rheumatoid arthritis - Still's disease               |
| Rheumatoid Arthritis | 905301000006114  | [RFC] Rheumatoid  |
| Rheumatoid Arthritis | 309787016        | Rheumatoid arthritis of cervical spine                        |
| Shingles             | 2849161000006110 | Herpes zoster auricularis                                     |
| Shingles             | 6589131000006110 | Herpes zoster keratitis                                       |
| Shingles             | 905671000006114  | [RFC] Shingles  |

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| Shingles | 18244018         | Herpes zoster with meningitis   |
| Shingles | 778951000006117  | Infective otitis externa due to herpes zoster                                 |
| Shingles | 1219080012       | Herpes zoster meningitis  |
| Shingles | 18585010         | Herpes zoster iridocyclitis   |
| Shingles | 286723017        | Herpes zoster   |
| Shingles | 8904017          | Shingles  |
| Shingles | 344958013        | Herpes zoster encephalitis  |
| Shingles | 286714015        | Herpes zoster with ophthalmic complication                                    |
| Shingles | 879141000006110  | Ophthalmic herpes zoster  |
| Shingles | 822201000006110  | Herpes zoster - otitis externa  |
| Shingles | 145090014        | Herpes zoster ophthalmicus  |
| Shingles | 2849241000006110 | Ramsay Hunt syndrome - auricular  |
| Shingles | 988701000006119  | Ophthalmic herpes zoster  |
| Shingles | 822321000006112  | Herpes zoster with other CNS complication NOS                                 |
| Shingles | 1786394018       | Varicella zoster nucleic acid detection                                       |
| Shingles | 44081000006115   | Ophthalmic herpes zoster infection  |
| Shingles | 8902018          | Herpes zoster infection   |
| Shingles | 1811051000006110 | Detection of Varicella zoster virus using polymerase chain reaction technique |
| Shingles | 706441000006117  | Herpes zoster with meningitis   |
| Shingles | 905931000006117  | [RFC] Shingles  |
| Shingles | 1229869010       | Herpes zoster with keratoconjunctivitis                                       |
| Shingles | 344957015        | Zoster encephalitis   |
| Shingles | 286722010        | Herpes zoster with unspecified complications                                  |
| Shingles | 288153012        | [X]Zoster with other complications  |
| Shingles | 2574471000006110 | Zoster  |
| Shingles | 191651000006117  | Ramsay Hunt syndrome  |
| Shingles | 2849211000006110 | HZO - Herpes zoster oticus  |
| Shingles | 7033231000006110 | Herpes zoster corneal endotheliitis   |
| Shingles | 286721015        | Herpes zoster with other specified complication NOS                           |
| Shingles | 288154018        | [X]Zoster without complications   |
| Shingles | 1139251000000110 | Hutchinson's sign   |
| Shingles | 286717010        | Herpes zoster with other ophthalmic complication                              |
| Shingles | 297557016        | Polyneuropathy in herpes zoster   |
| Shingles | 36819018         | Geniculate herpes zoster  |
| Shingles | 879151000006112  | Other herpes zoster   |
| Shingles | 286715019        | Herpes zoster with dermatitis of eyelid                                       |
| Shingles | 2849191000006110 | Herpes zoster oticus  |
| Shingles | 822331000006110  | Herpes zoster with other CNS complications                                    |
| Shingles | 640911000006110  | Encephalitis due to herpes zoster   |
| Shingles | 481174015        | Herpes zoster otitis externa  |
| Shingles | 625341000006116  | Disseminated herpes zoster  |
| Shingles | 286718017        | Herpes zoster with complication   |
| Shingles | 9871621000006120 | Keratitis of right eye due to herpes zoster                                   |
| Shingles | 395349015        | Herpes zoster with nervous system complication                                |

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| Shingles                     | 1139221000000110 | Hutchinson's sign - herpes zoster involving nose tip               |
| Shingles                     | 7033251000006110 | Herpes zoster corneal endothelialitis                              |
| Sjogren's syndrome           | 301720019        | Lung disease with Sjogren's disease                                |
| Sjogren's syndrome           | 3865081000006110 | Sjogrens syndrome  |
| Sjogren's syndrome           | 3865061000006110 | Sjogren's syndrome   |
| Sjogren's syndrome           | 297645018        | Myopathy due to Sjogren's disease                                  |
| Sjogren's syndrome           | 4782481000006110 | Lung disease with Sjogren's disease                                |
| Sjogren's syndrome           | 3865031000006110 | Sjogren's syndrome   |
| Sjogren's syndrome           | 3865071000006110 | Sjogren syndrome   |
| Sjogren's syndrome           | 141091000006112  | Sicca syndrome   |
| Stickler's syndrome'         | 130548012        | Stickler syndrome  |
| Systemic Lupus Erythematosus | 92208011         | Systemic lupus erythematosus                                       |
| Systemic Lupus Erythematosus | 114251000006118  | Systemic lupus erythematosus with organ/system involvement         |
| Systemic Lupus Erythematosus | 512234017        | Cerebral lupus   |
| Systemic Lupus Erythematosus | 309405011        | Drug-induced systemic lupus erythematosus                          |
| Systemic Lupus Erythematosus | 3400601000006110 | SLE - Systemic lupus erythematosus                                 |
| Systemic Lupus Erythematosus | 453243010        | Systemic lupus erythematosus with pericarditis                     |
| Systemic Lupus Erythematosus | 158442019        | Systemic lupus erythematosus encephalitis                          |
| Systemic Lupus Erythematosus | 677561000006119  | Nephrotic syndrome in systemic lupus erythematosus                 |
| Systemic Lupus Erythematosus | 309408013        | Systemic lupus erythematosus NOS                                   |
| Systemic Lupus Erythematosus | 177301000006114  | Renal tubulo-interstitial disorder in systemic lupus erythematosus |
| Systemic Lupus Erythematosus | 301721015        | Lung disease with systemic lupus erythematosus                     |
| Systemic Lupus Erythematosus | 312579010        | [X]Other forms of systemic lupus erythematosus                     |
| Systemic Lupus Erythematosus | 92209015         | Disseminated lupus erythematosus                                   |
| Systemic Lupus Erythematosus | 114310015        | Lupus nephritis  |
| Systemic Lupus Erythematosus | 1728151000006110 | Systemic lupus erythematosus encephalitis                          |
| Tendon Rupture               | 3959061000006110 | Secondary repair of ruptured Achilles tendon                       |
| Tendon Rupture               | 7520341000006110 | Rupture of tibialis posterior tendon                               |

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| Tendon Rupture | 8450981000006110  | Nontraumatic rupture of rotator cuff of right shoulder                                    |
| Tendon Rupture | 311510016         | Hand and wrist flexor tendon rupture  |
| Tendon Rupture | 4914341000006110  | Repair of ruptured tendon   |
| Tendon Rupture | 3900221000006110  | Rupture of tendon of biceps, long head  |
| Tendon Rupture | 891461000006114   | Tendon rupture - non traumatic  |
| Tendon Rupture | 320508012         | Rupture subscapularis tendon  |
| Tendon Rupture | 657981000006117   | Extensor pollicis longus rupture  |
| Tendon Rupture | 891521000006116   | Tendon rupture - multiple   |
| Tendon Rupture | 8451091000006110  | Nontraumatic complete rupture of right rotator cuff structure                             |
| Tendon Rupture | 25511000006117    | Other nontraumatic tendon rupture   |
| Tendon Rupture | 5142381000006110  | Rupture of tendon of knee region  |
| Tendon Rupture | 743501000006119   | Lindholm repair of ruptured tendon  |
| Tendon Rupture | 2532989013        | Spontaneous rupture of extensor tendons   |
| Tendon Rupture | 891471000006119   | Tendon rupture - shoulder   |
| Tendon Rupture | 5142031000006110  | Rupture of tendon of elbow region   |
| Tendon Rupture | 320523019         | Rupture tendon thumb NOS  |
| Tendon Rupture | 891501000006114   | Ruptured Achilles Tendon  |
| Tendon Rupture | 159151000006116   | Rupture of tendon of upper arm  |
| Tendon Rupture | 5502751000006110  | Spontaneous tendon rupture  |
| Tendon Rupture | 8451001000006110  | Nontraumatic rupture of muscle or tendon structure of rotator cuff of right shoulder      |
| Tendon Rupture | 12727661000000000 | Other non-traumatic tendon rupture  |
| Tendon Rupture | 158711000006114   | Rupture of hamstring tendon   |
| Tendon Rupture | 2564431000006110  | Rotator cuff rupture  |
| Tendon Rupture | 297671000006119   | Non-traumatic rupture of Achilles tendon  |
| Tendon Rupture | 5652911000006110  | Rupture of tendon of upper limb   |
| Tendon Rupture | 12125511000000000 | Non-traumatic complete rupture of rotator cuff of bilateral shoulders                     |
| Tendon Rupture | 391082017         | Rupture of tendon   |
| Tendon Rupture | 9479621000006110  | Nontraumatic rupture of rotator cuff of both shoulders                                    |
| Tendon Rupture | 891511000006112   | Tendon rupture - NOS  |
| Tendon Rupture | 9438031000006110  | Rupture of right Achilles tendon  |
| Tendon Rupture | 3313991000006110  | Anesthesia for tenodesis, rupture of long tendon of biceps                                |
| Tendon Rupture | 320525014         | Rupture flexor digitorum superficialis tendon   |
| Tendon Rupture | 7534371000006110  | Chronic rupture of Achilles tendon  |
| Tendon Rupture | 9479601000006110  | Nontraumatic rupture of muscle or tendon structure of rotator cuff of bilateral shoulders |
| Tendon Rupture | 320543013         | Other specified tendon rupture  |
| Tendon Rupture | 311526015         | Rupture of tendon of foot and ankle   |
| Tendon Rupture | 311509014         | Hand and wrist extensor tendon rupture  |
| Tendon Rupture | 5730651000006110  | Tendon rupture - hip  |
| Tendon Rupture | 5730631000006110  | Tendon rupture - shoulder   |
| Tendon Rupture | 3526572015        | Traumatic rupture of right biceps femoris tendon  |
| Tendon Rupture | 320514017         | Rupture tendon forearm or wrist   |
| Tendon Rupture | 320519010         | Rupture flexor pollicis longus  |
| Tendon Rupture | 6882461000006110  | Traumatic or non-traumatic rupture of tendon  |
| Tendon Rupture | 320540011         | Rupture foot flexor tendon  |

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| Tendon Rupture | 2991861000006110 | Reinsertion of ruptured biceps tendon, distal, with tendon graft                              |
| Tendon Rupture | 5459561000006110 | Rupture of gastrocnemius tendon   |
| Tendon Rupture | 8451141000006110 | Nontraumatic complete rupture of muscle or tendon structure of rotator cuff of left shoulder  |
| Tendon Rupture | 311520014        | Rupture of posterior tibial tendon  |
| Tendon Rupture | 312648017        | [X]Spontaneous rupture of other tendons   |
| Tendon Rupture | 5730621000006110 | Shoulder tendon rupture   |
| Tendon Rupture | 4816821000006110 | Non-traumatic rupture of patellar tendon  |
| Tendon Rupture | 6882501000006110 | Traumatic rupture of tendon   |
| Tendon Rupture | 1235098010       | Rupture long head biceps tendon   |
| Tendon Rupture | 320539014        | Rupture plantaris tendon  |
| Tendon Rupture | 2564451000006110 | Rupture of rotator cuff of shoulder   |
| Tendon Rupture | 4820521000006110 | Primary open repair of ruptured Achilles tendon with graft                                    |
| Tendon Rupture | 933381000006110  | Tendon rupture - elbow  |
| Tendon Rupture | 761911000006119  | Flexor digitorum profundus tendon rupture   |
| Tendon Rupture | 8451081000006110 | Nontraumatic complete rupture of muscle or tendon structure of rotator cuff of right shoulder |
| Tendon Rupture | 2615021000006110 | Anesthesia for repair of ruptured Achilles tendon   |
| Tendon Rupture | 5652891000006110 | Rupture of tendon of head and neck  |
| Tendon Rupture | 7173741000006110 | Rupture of distal quadriceps muscle   |
| Tendon Rupture | 1233051016       | Quadriceps tendon rupture   |
| Tendon Rupture | 5142141000006110 | Rupture of flexor tendon of thumb   |
| Tendon Rupture | 297681000006116  | Nontraumatic rupture of patellar tendon   |
| Tendon Rupture | 297701000006118  | Nontraumatic tendon rupture, unspecified  |
| Tendon Rupture | 159031000006110  | Rupture of quadriceps tendon  |
| Tendon Rupture | 158631000006112  | Rupture biceps tendon   |
| Tendon Rupture | 164821000006112  | Rotator cuff complete rupture   |
| Tendon Rupture | 320536019        | Rupture upper leg tendon NOS  |
| Tendon Rupture | 391083010        | Traumatic rupture of biceps tendon  |
| Tendon Rupture | 5142151000006110 | Rupture of extensor tendon of thumb   |
| Tendon Rupture | 320530013        | Rupture extensor digitorum tendon   |
| Tendon Rupture | 891421000006115  | Tendon rupture - knee   |
| Tendon Rupture | 5142631000006110 | Rupture of tendon of foot region  |
| Tendon Rupture | 9478811000006110 | Nontraumatic rupture of long head of biceps brachii tendon of right shoulder                  |
| Tendon Rupture | 6866081000006110 | Non-traumatic rupture of biceps brachii tendon  |
| Tendon Rupture | 6598371000006110 | Inguinal hernia due to rupture of prepubic tendon   |
| Tendon Rupture | 320515016        | Rupture wrist extensors   |
| Tendon Rupture | 7534361000006110 | Acute rupture of Achilles tendon  |
| Tendon Rupture | 320516015        | Rupture wrist flexors   |
| Tendon Rupture | 320524013        | Rupture tendon of finger  |
| Tendon Rupture | 320542015        | Rupture tendon leg or foot NOS  |
| Tendon Rupture | 4853221000006110 | Rupture of infraspinatus tendon   |
| Tendon Rupture | 311519015        | Flexor pollicis longus tendon rupture   |
| Tendon Rupture | 7104601000006110 | History of repair of rupture of quadriceps tendon   |
| Tendon Rupture | 9438051000006120 | Rupture of left Achilles tendon   |

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| Tendon Rupture | 891431000006117   | Tendon rupture - hip   |
| Tendon Rupture | 4877011000006110  | Repair of ruptured tendon of hand                                  |
| Tendon Rupture | 5503141000006110  | Tendon rupture - wrist   |
| Tendon Rupture | 4192941000006110  | Rupture of extensor tendons of hand AND/OR wrist                   |
| Tendon Rupture | 8451131000006110  | Nontraumatic complete rupture of left rotator cuff structure       |
| Tendon Rupture | 4824291000006110  | Primary percutaneous repair of ruptured Achilles tendon with graft |
| Tendon Rupture | 320541010         | Rupture foot extensor tendon                                       |
| Tendon Rupture | 5728801000006110  | Tendon rupture - elbow   |
| Tendon Rupture | 3089441000006110  | Tenodesis for rupture of biceps tendon at elbow                    |
| Tendon Rupture | 2532988017        | Spontaneous rupture of flexor tendons                              |
| Tendon Rupture | 12125521000000000 | Non-traumatic complete rupture of rotator cuff of both shoulders   |
| Tendon Rupture | 4853351000006110  | Rupture of extensor pollicis longus                                |
| Tendon Rupture | 9479611000006110  | Nontraumatic rupture of rotator cuff of bilateral shoulders        |
| Tendon Rupture | 320526010         | Flexor digitorum sublimis tendon rupture                           |
| Tendon Rupture | 320520016         | Rupture extensor pollicis longus                                   |
| Tendon Rupture | 891441000006110   | Tendon rupture - hand  |
| Tendon Rupture | 8451111000006110  | Nontraumatic complete rupture of rotator cuff of left shoulder     |
| Tendon Rupture | 5730641000006110  | Tendon rupture - hand  |
| Tendon Rupture | 7084731000006110  | Traumatic rupture of extensor tendon of finger                     |
| Tendon Rupture | 320507019         | Rupture infraspinatus tendon                                       |
| Tendon Rupture | 320512018         | Rupture tendon upper arm NOS                                       |
| Tendon Rupture | 311521013         | Peroneus longus rupture  |
| Tendon Rupture | 8451031000006110  | Non-traumatic rupture of rotator cuff of left shoulder             |
| Tendon Rupture | 3461921000006110  | Repair of ruptured supraspinatus tendon, acute                     |
| Tendon Rupture | 320518019         | Rupture tendon of thumb  |
| Tendon Rupture | 990191000006112   | Tendon rupture - NOS   |
| Tendon Rupture | 320527018         | Rupture flexor digitorum profundus tendon                          |
| Tendon Rupture | 3313981000006110  | Anaesthesia for tenodesis, rupture of long tendon of biceps        |
| Tendon Rupture | 320537011         | Rupture of tendon of lower limb                                    |
| Tendon Rupture | 2615011000006110  | Anaesthesia for repair of ruptured Achilles tendon                 |
| Tendon Rupture | 8450991000006110  | Non-traumatic rupture of rotator cuff of right shoulder            |
| Tendon Rupture | 891491000006118   | Tendon rupture - ankle/foot  |
| Tendon Rupture | 7695891000006110  | Nontraumatic rupture of extensor tendon of hand and wrist          |
| Tendon Rupture | 3064051000006110  | Secondary repair of ruptured Achilles tendon with graft            |
| Tendon Rupture | 5142121000006110  | Rupture of extensor tendon of finger                               |
| Tendon Rupture | 158621000006114   | Rupture of Achilles tendon   |
| Tendon Rupture | 311513019         | Extensor digitorum communis rupture                                |
| Tendon Rupture | 6621411000006110  | Supraspinatus rupture  |
| Tendon Rupture | 891451000006112   | Tendon rupture - wrist   |
| Tendon Rupture | 7095091000006110  | Rupture of biceps tendon   |
| Tendon Rupture | 933371000006112   | Tendon rupture - shoulder  |
| Tendon Rupture | 5142131000006110  | Rupture of flexor tendon of finger                                 |
| Tendon Rupture | 1786831018        | Rupture supraspinatus tendon                                       |
| Tendon Rupture | 5459581000006110  | Rupture of peroneal tendon   |
| Tendon Rupture | 5652901000006110  | Rupture of tendon of trunk   |

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| Tendon Rupture | 7107681000006110  | Rupture of distal quadriceps tendon  |
| Tendon Rupture | 320510014         | Rupture triceps tendon   |
| Tendon Rupture | 320517012         | Rupture of tendon of wrist and hand  |
| Tendon Rupture | 9478841000006110  | Nontraumatic rupture of long head of biceps tendon of right shoulder   |
| Tendon Rupture | 2997061000006110  | Rupture of patellar tendon   |
| Tendon Rupture | 5142521000006110  | Rupture of tendon of lower leg and ankle   |
| Tendon Rupture | 6882481000006110  | Traumatic rupture of patellar tendon   |
| Tendon Rupture | 932731000006117   | Tendon rupture - ankle/foot  |
| Tendon Rupture | 891481000006116   | Tendon rupture - elbow   |
| Tendon Rupture | 320532017         | Rupture of tendon of finger  |
| Tendon Rupture | 7085261000006110  | Traumatic rupture of quadriceps tendon   |
| Tendon Rupture | 6882451000006110  | Rupture of tendon  |
| Tendon Rupture | 4853511000006110  | Rupture of flexor tendon of foot   |
| Tendon Rupture | 3308251000006110  | Rupture of flexor tendons of hand AND/OR wrist   |
| Tendon Rupture | 311515014         | Long head of biceps rupture  |
| Tendon Rupture | 4853491000006110  | Rupture of plantaris tendon  |
| Tendon Rupture | 4853311000006110  | Rupture of tendon of thumb   |
| Tendon Rupture | 411302017         | Ruptured Achilles tendon - traumatic   |
| Tendon Rupture | 7507341000006110  | Traumatic rupture of rotator cuff  |
| Tendon Rupture | 6208141000006110  | Primary open repair of ruptured Achilles tendon  |
| Tendon Rupture | 6208101000006110  | Primary percutaneous repair of ruptured Achilles tendon  |
| Tendon Rupture | 5730611000006110  | Tendon rupture - multiple  |
| Tendon Rupture | 8451021000006110  | Nontraumatic rupture of rotator cuff of left shoulder  |
| Tendon Rupture | 3606221000006110  | Tenodesis for rupture of long tendon of biceps   |
| Tendon Rupture | 4816141000006110  | Complete rupture of rotator cuff   |
| Tendon Rupture | 12125501000000000 | Bilateral non-traumatic complete rupture of rotator cuff of shoulders<br>Nontraumatic rupture of muscle or tendon structure of rotator cuff of left shoulder |
| Tendon Rupture | 8451041000006110  | Nontraumatic rupture of muscle or tendon structure of rotator cuff of left shoulder  |
| Tendon Rupture | 3526570011        | Traumatic rupture of left biceps femoris tendon  |
| Tendon Rupture | 9479591000006110  | Non-traumatic rupture of rotator cuff of both shoulders  |
| Tendon Rupture | 9479581000006110  | Bilateral nontraumatic rotator cuff rupture  |
| Tendon Rupture | 9478831000006110  | Nontraumatic rupture of long head of right biceps brachii tendon<br>Non-traumatic rupture of long head of biceps brachii tendon of right shoulder            |
| Tendon Rupture | 9478821000006110  | Nontraumatic rupture of long head of biceps brachii tendon of right shoulder   |
| Tendon Rupture | 7089971000006110  | Rupture of proximal quadriceps muscle  |
| Tendon Rupture | 159011000006116   | Patellar tendon rupture  |
| Tendon Rupture | 4853331000006110  | Ruptured tendon of thumb   |
| Tendon Rupture | 7104611000006110  | History of repair of quadriceps tendon rupture   |
| Tendon Rupture | 297691000006118   | Non-traumatic tendon rupture   |
| Tendon Rupture | 3584501000006110  | Repair of ruptured supraspinatus tendon, chronic   |
| Tendon Rupture | 320533010         | Rupture tendon thigh   |
| Tendon Rupture | 8451061000006110  | Nontraumatic complete rupture of rotator cuff of right shoulder  |
| Tendon Rupture | 7104541000006110  | Rupture achilles tendon  |
| Tendon Rupture | 7119391000006110  | Nontraumatic rupture of tibialis posterior tendon  |
| Tendon Rupture | 7095081000006110  | Rupture of tendon of biceps  |
| Tendon Rupture | 8451071000006110  | Non-traumatic complete rupture of rotator cuff of right shoulder   |

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| Tendon Rupture | 3527928019       | Nontraumatic rupture of long head of biceps brachii tendon of left shoulder |
| Tendon Rupture | 510491000006113  | Biceps tendon rupture   |
| Tendon Rupture | 8451121000006110 | Non-traumatic complete rupture of rotator cuff of left shoulder             |
| Tendon Rupture | 7130301000006110 | Rupture of proximal quadriceps tendon                                       |
| Tuberculosis   | 286260017        | Tuberculous meningitis NOS  |
| Tuberculosis   | 286331012        | Tuberculosis of other organs NOS  |
| Tuberculosis   | 132741012        | Isolated bronchial tuberculosis   |
| Tuberculosis   | 18908019         | Tuberculous adenitis  |
| Tuberculosis   | 27784014         | Tuberculosis of retroperitoneal lymph nodes                                 |
| Tuberculosis   | 286267019        | Tuberculous encephalitis or myelitis NOS                                    |
| Tuberculosis   | 286297010        | Tuberculosis of other organs  |
| Tuberculosis   | 82741000006111   | Tuberculosis pericardium  |
| Tuberculosis   | 97107015         | Tuberculous meningitis  |
| Tuberculosis   | 2437721000000110 | Extensively drug resistant tuberculosis                                     |
| Tuberculosis   | 128905016        | Isolated tracheal tuberculosis  |
| Tuberculosis   | 93954019         | Tuberculosis of nasopharynx   |
| Tuberculosis   | 2646197017       | Multidrug resistant tuberculosis  |
| Tuberculosis   | 288008012        | [X]Miliary tuberculosis, unspecified  |
| Tuberculosis   | 251538012        | H/O: tuberculosis   |
| Tuberculosis   | 286252018        | Other specified respiratory tuberculosis                                    |
| Tuberculosis   | 82841000006116   | Tuberculous arthritis   |
| Tuberculosis   | 287966014        | Late effects of tuberculosis of other specified organs                      |
| Tuberculosis   | 286231014        | Tuberculosis of intrathoracic lymph nodes NOS                               |
| Tuberculosis   | 104401018        | Tuberculous cervicitis  |
| Tuberculosis   | 116837013        | Tuberculous laryngitis  |
| Tuberculosis   | 89021000006112   | Tuberculosis - scrofuloderma  |
| Tuberculosis   | 239551014        | Pulmonary tuberculosis  |
| Tuberculosis   | 288003015        | [X]Other tuberculosis of nervous system                                     |
| Tuberculosis   | 24141013         | Tuberculosis of hip   |
| Tuberculosis   | 149374011        | Tuberculous fibrosis of lung  |
| Tuberculosis   | 286217014        | Infiltrative lung tuberculosis  |
| Tuberculosis   | 287962011        | [X]Sequelae of genitourinary tuberculosis                                   |
| Tuberculosis   | 18298019         | Lupus vulgaris  |
| Tuberculosis   | 264413015        | TB - tuberculosis notification  |
| Tuberculosis   | 136831015        | Tuberculosis of mediastinal lymph nodes                                     |
| Tuberculosis   | 286285014        | Tuberculous nephropathy   |
| Tuberculosis   | 62169019         | Congenital tuberculosis   |
| Tuberculosis   | 286282012        | Tuberculosis of other specified bones                                       |
| Tuberculosis   | 878971000006113  | Tuberculosis - GIT  |
| Tuberculosis   | 286314017        | Tuberculosis of peripheral lymph nodes NOS                                  |
| Tuberculosis   | 138939013        | Tuberculosis of mediastinum   |
| Tuberculosis   | 301563019        | Pneumoconiosis associated with tuberculosis                                 |
| Tuberculosis   | 2673241000006110 | Tuberculosis of lymph node  |
| Tuberculosis   | 286220018        | Tuberculosis of bronchus  |



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| Tuberculosis | 7551011          | Tuberculosis of genitourinary system  |
| Tuberculosis | 40681016         | Tuberculous hydrothorax   |
| Tuberculosis | 286269016        | Tuberculosis of central nervous system  |
| Tuberculosis | 89061000006118   | Tuberculosis endocardium  |
| Tuberculosis | 970941000006114  | Tuberculosis of urinary tract   |
| Tuberculosis | 83031000006112   | Tuberculous intraspinal abscess   |
| Tuberculosis | 2549441013       | Tuberculoma of spinal cord  |
| Tuberculosis | 1788181018       | Nodular lung tuberculosis   |
| Tuberculosis | 1140001000000110 | History of tuberculosis drug therapy  |
| Tuberculosis | 286286010        | Tuberculosis of kidney NOS  |
| Tuberculosis | 43285015         | Tuberculosis of nasal septum  |
| Tuberculosis | 3079711000006110 | Pott's disease  |
| Tuberculosis | 606691000006115  | Cystitis in tuberculosis  |
| Tuberculosis | 1227805012       | [V]Observation for suspected tuberculosis (TB)  |
| Tuberculosis | 286232019        | Isolated tracheobronchial tuberculosis  |
| Tuberculosis | 64199010         | Tuberculosis of large intestine   |
| Tuberculosis | 286272011        | Other gastrointestinal tract tuberculosis NOS   |
| Tuberculosis | 79348014         | Miliary tuberculosis  |
| Tuberculosis | 156441000006115  | Scrofula - tuberculous cervical lymph nodes   |
| Tuberculosis | 149683011        | Tuberculosis of cerebral meninges   |
| Tuberculosis | 286230010        | Tuberculous pleurisy NOS  |
| Tuberculosis | 2535679015       | Tuberculosis of urinary tract   |
| Tuberculosis | 20900014         | Tuberculosis of small intestine   |
| Tuberculosis | 2533972013       | Tuberculosis index case   |
| Tuberculosis | 82791000006119   | Tuberculosis with erythema nodosum hypersensitivity reaction                            |
| Tuberculosis | 719321000006114  | Lupus - tuberculous   |
| Tuberculosis | 286223016        | Other respiratory tuberculosis  |
| Tuberculosis | 1760211000006110 | Mycobacterium tuberculosis  |
| Tuberculosis | 878981000006111  | Tuberculosis - bones/joints   |
| Tuberculosis | 142044014        | Tuberculosis of tracheobronchial lymph nodes  |
| Tuberculosis | 287963018        | Late effects of genitourinary system tuberculosis                                       |
| Tuberculosis | 288006011        | [X]Acute miliary tuberculosis, unspecified  |
| Tuberculosis | 89091000006114   | Tuberculosis of lung, bacteriological and histological examination not done             |
| Tuberculosis | 286221019        | Other specified pulmonary tuberculosis  |
| Tuberculosis | 311931014        | Tuberculosis of the bones of multiple sites   |
| Tuberculosis | 2548770013       | Tuberculoma of brain  |
| Tuberculosis | 301662016        | Other pleural effusion excluding mention of tuberculosis                                |
| Tuberculosis | 2548529013       | Tuberculous abscess of spinal cord  |
| Tuberculosis | 2533741015       | Ciprofloxacin resistant tuberculosis  |
| Tuberculosis | 311924010        | Tuberculosis of limb bones NOS  |
| Tuberculosis | 311921019        | Tuberculosis of the lower leg bone  |
| Tuberculosis | 1777071000006110 | Reason for referral: Tuberculosis   |
| Tuberculosis | 293128014        | Tuberculous arthritis   |
| Tuberculosis | 715821000006116  | Maternal tuberculosis in the puerperium - baby delivered during current episode of care |

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| Tuberculosis | 286294015        | Tuberculosis of female genital organs                                |
| Tuberculosis | 308680019        | Erythema tuberculatum  |
| Tuberculosis | 89451000006113   | Tuberculosis of lung, bacteriologically and histologically negative  |
| Tuberculosis | 286242017        | Tuberculosis of lung, confirmed by unspecified means                 |
| Tuberculosis | 311915018        | Tuberculosis of sacrum/coccyx  |
| Tuberculosis | 287961016        | [X]Sequelae of central nervous system tuberculosis                   |
| Tuberculosis | 1230111017       | Peritonitis - tuberculous  |
| Tuberculosis | 406201015        | Tuberculosis of skin and subcutaneous tissue                         |
| Tuberculosis | 132731014        | Tuberculous pneumonia  |
| Tuberculosis | 286306011        | Tuberculosis of skin and subcutaneous tissue NOS                     |
| Tuberculosis | 311925011        | Tuberculosis of other bones  |
| Tuberculosis | 439011000006118  | Abscess iliopsoas non tuberculous                                    |
| Tuberculosis | 123913018        | Tuberculous erythema nodosum   |
| Tuberculosis | 311923016        | Tuberculosis of multiple limb bones                                  |
| Tuberculosis | 94320019         | Tuberculosis   |
| Tuberculosis | 299935013        | Acute myocarditis - tuberculous                                      |
| Tuberculosis | 311912015        | Tuberculosis of cervical spine                                       |
| Tuberculosis | 299882019        | Acute pericarditis - tuberculous                                     |
| Tuberculosis | 311930010        | Tuberculosis of the bones of other sites                             |
| Tuberculosis | 82771000006115   | Tuberculosis spleen  |
| Tuberculosis | 137346014        | Tuberculosis colliquativa  |
| Tuberculosis | 286334016        | Acute miliary tuberculosis of multiple sites                         |
| Tuberculosis | 413241000006118  | [X]Other resp tubercul,confirmd bacteriologicly+histologicly         |
| Tuberculosis | 304780016        | Female tuberculous pelvic inflammatory disease                       |
| Tuberculosis | 1222160013       | [X]Sequelae of tuberculosis of other organs                          |
| Tuberculosis | 43134017         | Tuberculous synovitis  |
| Tuberculosis | 2867041000006110 | Post-tuberculous bronchiectasis                                      |
| Tuberculosis | 2533738012       | Isoniazid resistant tuberculosis                                     |
| Tuberculosis | 59375015         | Tuberculous endometritis   |
| Tuberculosis | 286225011        | Tuberculous pleurisy   |
| Tuberculosis | 2533736011       | Rifampicin resistant tuberculosis                                    |
| Tuberculosis | 57296016         | Tuberculous myelitis   |
| Tuberculosis | 286257012        | Other specified respiratory tuberculosis NOS                         |
| Tuberculosis | 715781000006110  | Tuberculosis in pregnancy, childbirth and the puerperium - delivered |
| Tuberculosis | 53904019         | Tuberculosis of bladder  |
| Tuberculosis | 641081000006113  | Encephalitis due to tuberculosis                                     |
| Tuberculosis | 82911000006110   | Tuberculous encephalitis   |
| Tuberculosis | 111268016        | Tuberculosis cutis   |
| Tuberculosis | 286325014        | Tuberculosis of adrenal glands - Addison's disease                   |
| Tuberculosis | 89011000006116   | Tuberculosis - lupus vulgaris  |
| Tuberculosis | 286214019        | Tuberculous pleurisy in primary progressive tuberculosis             |
| Tuberculosis | 715811000006112  | Maternal tuberculosis in pregnancy/childbirth/puerperium NOS         |
| Tuberculosis | 38677017         | Tuberculous bronchiectasis   |
| Tuberculosis | 286216017        | Primary tuberculous infection NOS                                    |
| Tuberculosis | 288004014        | [X]Tuberculosis of nervous system, unspecified                       |

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| Tuberculosis | 175131000006112  | Respiratory tuberculosis, bacteriologically and histologically confirmed  |
| Tuberculosis | 73939018         | Renal tuberculosis  |
| Tuberculosis | 64723010         | Tuberculosis of spinal meninges   |
| Tuberculosis | 405021000006117  | [X]Oth resp tubercul, w/out m/bacteriol or histol confirmatn  |
| Tuberculosis | 715801000006114  | Maternal tuberculosis during pregnancy, childbirth and the puerperium   |
| Tuberculosis | 311928013        | Tuberculosis of the bones of the hand   |
| Tuberculosis | 299883012        | TB - acute pericarditis   |
| Tuberculosis | 134962018        | Tuberculosis of ureter  |
| Tuberculosis | 311548014        | Tuberculous infection of tendon sheath  |
| Tuberculosis | 81815010         | Tuberculosis of eye   |
| Tuberculosis | 130160016        | Tuberculosis of intrathoracic lymph nodes   |
| Tuberculosis | 288007019        | [X]Other miliary tuberculosis   |
| Tuberculosis | 287965013        | [X]Sequelae of tuberculosis of bones and joints   |
| Tuberculosis | 286320016        | Tuberculous chronic iridocyclitis   |
| Tuberculosis | 4514611000006110 | TB - Pulmonary tuberculosis   |
| Tuberculosis | 287964012        | Late effects of tuberculosis of bones and joints  |
| Tuberculosis | 83211000006113   | Tuberculous pleurisy, confirmed bacteriologically and histologically  |
| Tuberculosis | 301646010        | Pleurisy without effusion or active tuberculosis  |
| Tuberculosis | 424881000006119  | [X]Resp tuberculos unspcfd,confirmd bacteriolog+histologicly  |
| Tuberculosis | 286289015        | Tuberculosis of male genital organs   |
| Tuberculosis | 286330013        | Tuberculosis of other specified organs NOS  |
| Tuberculosis | 887931000006118  | Preg. + tuberculosis  |
| Tuberculosis | 1494889019       | Tuberculosis of bones and joints  |
| Tuberculosis | 175141000006119  | Resp TB unspcf,w/out mention/bacterial or histol confirmtn  |
| Tuberculosis | 879001000006114  | Tuberculosis - other organs   |
| Tuberculosis | 650101000006113  | Examination for suspected tuberculosis  |
| Tuberculosis | 286292016        | Tuberculous oophoritis or salpingitis   |
| Tuberculosis | 286281017        | Tuberculosis limb bones - Tuberculous dactylitis  |
| Tuberculosis | 89101000006115   | Tuberculosis myocardium   |
| Tuberculosis | 288005010        | [X]Tuberculosis of other specified organs<br>Tuberculosis of lung, confirmed by sputum microscopy with or without culture |
| Tuberculosis | 107761000006118  |   |
| Tuberculosis | 311927015        | Tuberculosis of the bones of the shoulder region  |
| Tuberculosis | 88991000006119   | Tuberculosis - lupus exedens  |
| Tuberculosis | 208961000006118  | Prim respiratory TB without mention of bact or hist confirm   |
| Tuberculosis | 2533740019       | Ethambutol resistant tuberculosis   |
| Tuberculosis | 286328011        | Tuberculosis of stomach   |
| Tuberculosis | 286333010        | Acute miliary tuberculosis of a single specified site   |
| Tuberculosis | 286303015        | Tuberculosis - lupus NOS  |
| Tuberculosis | 1235995011       | Tuberculosis lichenoides<br>Tuberculosis of larynx, trachea and bronchus, confirmed bacteriologically and histologically  |
| Tuberculosis | 89391000006112   |   |
| Tuberculosis | 286273018        | Tuberculosis of gastrointestinal tract  |
| Tuberculosis | 451125010        | [V] Personal history of pulmonary tuberculosis  |
| Tuberculosis | 146495016        | Primary tuberculous complex   |
| Tuberculosis | 89521000006117   | Tuberculosis of mesenteric lymph glands   |

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| Tuberculosis | 118567019        | Tuberculous mastoiditis  |
| Tuberculosis | 303801017        | [X]Tuberculous disorders of intestine and mesentery                                      |
| Tuberculosis | 286270015        | Tuberculosis of intestines, peritoneum and mesenteric glands                             |
| Tuberculosis | 138730017        | Tuberculosis of epididymis   |
| Tuberculosis | 56584015         | Tuberculosis verrucosa cutis   |
| Tuberculosis | 715831000006118  | Maternal tuberculosis in the puerperium - baby delivered during previous episode of care |
| Tuberculosis | 311926012        | Tuberculosis of bone, site unspecified   |
| Tuberculosis | 286337011        | Other specified tuberculosis   |
| Tuberculosis | 286311013        | Scrofulous tuberculous abscess   |
| Tuberculosis | 105237015        | Primary tuberculous infection  |
| Tuberculosis | 311929017        | Tuberculosis of the bones of the ankle and foot  |
| Tuberculosis | 20683012         | Inactive tuberculosis  |
| Tuberculosis | 34267015         | Tuberculosis of prostate   |
| Tuberculosis | 311922014        | Tuberculosis of other limb bones   |
| Tuberculosis | 168861000006111  | Respiratory tuberculosis, not confirmed bacteriologically or histologically              |
| Tuberculosis | 286322012        | Tuberculosis of eye NOS  |
| Tuberculosis | 461185011        | [V]Observation for suspected tuberculosis  |
| Tuberculosis | 82550012         | Tuberculous salpingitis  |
| Tuberculosis | 286239011        | Tuberculosis of lung, confirmed histologically   |
| Tuberculosis | 3449531000006110 | TB - Tuberculous meningitis  |
| Tuberculosis | 82801000006118   | Tuberculous cervical lymphadenitis   |
| Tuberculosis | 108231015        | Tuberculous pyelonephritis   |
| Tuberculosis | 286295019        | Tuberculosis of other female genital organs NOS  |
| Tuberculosis | 73938014         | Tuberculosis of kidney   |
| Tuberculosis | 1834101000006110 | Sputum culture mycobacterium tuberculosis positive                                       |
| Tuberculosis | 74349016         | Tuberculous peritonitis  |
| Tuberculosis | 139628019        | Tuberculous oophoritis   |
| Tuberculosis | 2002931000006110 | Tuberculosis symptom screen  |
| Tuberculosis | 878961000006118  | Tuberculosis - meninges/CNS  |
| Tuberculosis | 59684010         | Tuberculoma of meninges  |
| Tuberculosis | 286335015        | Other specified miliary tuberculosis   |
| Tuberculosis | 286265010        | Tuberculous encephalitis or myelitis   |
| Tuberculosis | 45053014         | Tuberculosis of thyroid gland  |
| Tuberculosis | 1763591000006110 | Sputum culture mycobacterium tuberculosis negative                                       |
| Tuberculosis | 2533971018       | On tuberculosis chemoprophylaxis   |
| Tuberculosis | 296922015        | Tuberculous intracranial abscess   |
| Tuberculosis | 1230741010       | Fallopian tube tuberculosis  |
| Tuberculosis | 286262013        | Tuberculous abscess of brain   |
| Tuberculosis | 49747014         | Tuberculous pneumothorax   |
| Tuberculosis | 454208016        | [V] Personal history of tuberculosis   |
| Tuberculosis | 151549019        | Tuberculous encephalitis   |
| Tuberculosis | 311919012        | Tuberculosis of the forearm bone   |
| Tuberculosis | 68651015         | Tuberculosis papulonecrotica   |
| Tuberculosis | 286215018        | Primary progressive tuberculosis   |

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| Tuberculosis | 878991000006114  | Tuberculosis-kidney + other GU   |
| Tuberculosis | 123534017        | Tuberculosis of hilar lymph nodes  |
| Tuberculosis | 715791000006113  | Maternal tuberculosis during pregnancy - baby not yet delivered                  |
| Tuberculosis | 89511000006113   | Tuberculosis of meninges and central nervous system                              |
| Tuberculosis | 387571000000119  | Other specified tuberculosis support   |
| Tuberculosis | 301656014        | Pleurisy without effusion or active tuberculosis NOS                             |
| Tuberculosis | 710951000006114  | Meningitis - tuberculous   |
| Tuberculosis | 1228336010       | Tuberculosis of vertebral column - Pott's  |
| Tuberculosis | 286338018        | Tuberculosis NOS   |
| Tuberculosis | 2611701000000110 | Infection resistant to tuberculostatic drug                                      |
| Tuberculosis | 286296018        | Genitourinary tuberculosis NOS   |
| Tuberculosis | 13280016         | Tuberculosis of rectum   |
| Tuberculosis | 3861121000006110 | Tuberculous epididymitis   |
| Tuberculosis | 107751000006115  | TB intrathoracic lymph nodes confirm bact histologically                         |
| Tuberculosis | 52073015         | Tuberculous meningoenkephalitis  |
| Tuberculosis | 715841000006111  | Maternal tuberculosis,unspec whether in pregnancy/puerperium                     |
| Tuberculosis | 380421000000115  | Tuberculosis support   |
| Tuberculosis | 65908017         | Tuberculosis of anus   |
| Tuberculosis | 203531000006112  | Prostatitis in tuberculosis  |
| Tuberculosis | 311914019        | Tuberculosis of lumbar spine   |
| Tuberculosis | 429601000006111  | [X]Tuberculosis  |
| Tuberculosis | 287960015        | Late effects of central nervous system tuberculosis                              |
| Tuberculosis | 287958017        | Late effects of tuberculosis   |
| Tuberculosis | 286327018        | Tuberculosis of other specified organs   |
| Tuberculosis | 732921000006113  | Lung tuberculosis  |
| Tuberculosis | 264412013        | Notification of tuberculosis   |
| Tuberculosis | 287959013        | Late effects of respiratory tuberculosis   |
| Tuberculosis | 286222014        | Pulmonary tuberculosis NOS   |
| Tuberculosis | 87729013         | Tuberculosis of nasal sinus  |
| Tuberculosis | 1039301000006110 | Adverse reaction to Tuberculin Ppd   |
| Tuberculosis | 139795018        | Tuberculous episcleritis   |
| Tuberculosis | 387991000000112  | Tuberculosis support NOS   |
| Tuberculosis | 424871000006117  | [X]Resp TB unspcf,w/out mention/bacterial or histol confrmtn                     |
| Tuberculosis | 286293014        | Tuberculous oophoritis or salpingitis NOS  |
| Tuberculosis | 89121000006113   | Tuberculosis oesophagus  |
| Tuberculosis | 286317012        | Tuberculous chorioretinitis  |
| Tuberculosis | 206221000006117  | Primary respiratory tuberculosis, confirmed bacteriologically and histologically |
| Tuberculosis | 286329015        | Tuberculosis of liver  |
| Tuberculosis | 286268012        | Other specified tuberculosis of central nervous system                           |
| Tuberculosis | 907551000006110  | [RFC] Tuberculosis   |
| Tuberculosis | 286284013        | Tuberculosis of bones or joints NOS  |
| Tuberculosis | 286336019        | Miliary tuberculosis NOS   |
| Tuberculosis | 286283019        | Tuberculosis of joint  |
| Tuberculosis | 286235017        | Isolated tracheal or bronchial tuberculosis NOS                                  |

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| Tuberculosis | 667971000000118  | Latent tuberculosis                                      |
| Tuberculosis | 287967017        | Late effects of tuberculosis NOS                         |
| Tuberculosis | 2533737019       | Pyrazinamide resistant tuberculosis                      |
| Tuberculosis | 63627011         | Tuberculosis of testis                                   |
| Tuberculosis | 82761000006110   | Tuberculosis seminal vesicle                             |
| Tuberculosis | 1228335014       | Tuberculosis of spine (Pott's)                           |
| Tuberculosis | 311918016        | Tuberculosis of the upper arm bone                       |
| Tuberculosis | 24683016         | Tuberculous empyema                                      |
| Tuberculosis | 286224010        | Tuberculosis of pleura                                   |
| Tuberculosis | 286332017        | Acute miliary tuberculosis                               |
| Tuberculosis | 311917014        | Tuberculosis of unspecified limb bone                    |
| Tuberculosis | 131348017        | Tuberculous interstitial keratitis                       |
| Tuberculosis | 286288011        | Tuberculosis of urinary organs                           |
| Tuberculosis | 286323019        | Tuberculosis of ear                                      |
| Tuberculosis | 311920018        | Tuberculosis of the pelvic and thigh bones               |
| Tuberculosis | 286321017        | Tuberculous keratoconjunctivitis                         |
| Tuberculosis | 311916017        | Tuberculosis of limb bones                               |
| Tuberculosis | 61952018         | Tuberculous pyelitis                                     |
| Tuberculosis | 286291011        | Tuberculosis of other male genital organs NOS            |
| Tuberculosis | 288298014        | Sequelae of tuberculosis                                 |
| Tuberculosis | 311932019        | Tuberculosis of bone                                     |
| Tuberculosis | 83161000006116   | Tuberculous osteomyelitis                                |
| Tuberculosis | 2533735010       | Streptomycin resistant tuberculosis                      |
| Tuberculosis | 281631019        | Disseminated tuberculosis                                |
| Tuberculosis | 286219012        | Tuberculosis of lung with cavitation                     |
| Tuberculosis | 127902015        | Tuberculosis of peripheral lymph nodes                   |
| Tuberculosis | 286309016        | Erythema nodosum with tuberculosis NOS                   |
| Tuberculosis | 298355010        | Keratitis due to tuberculosis                            |
| Tuberculosis | 2690961000006110 | Tuberculosis infection latent                            |
| Tuberculosis | 311913013        | Tuberculosis of thoracic spine                           |
| Tuberculosis | 28980013         | Tuberculosis of knee                                     |
| Tuberculosis | 20174015         | Tuberculous leptomeningitis                              |
| Tuberculosis | 286271016        | Other gastrointestinal tract tuberculosis                |
| Tuberculosis | 878951000006115  | Primary tuberculosis infection                           |
| Tuberculosis | 286238015        | Tuberculosis of lung, confirmed by culture only          |
| Tuberculosis | 82541000006118   | Tuberculosis of vertebral column                         |
| Uveitis      | 287233017        | Syphilitic uveitis unspecified                           |
| Uveitis      | 6894331000006110 | toxoplasmosis retinitis                                  |
| Uveitis      | 2857851000006110 | CMV retinitis  |
| Uveitis      | 6017231000006110 | Serpiginous choroiditis                                  |
| Uveitis      | 2736161000006110 | Generalised disseminated choroiditis AND chorioretinitis |
| Uveitis      | 3934751000006110 | Focal chorioretinitis caused by acquired toxoplasmosis   |
| Uveitis      | 8109771000006110 | Acute anterior uveitis of left eye                       |
| Uveitis      | 110078018        | Secondary syphilitic chorioretinitis                     |
| Uveitis      | 2780151000006110 | Cyclitis   |

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| Uveitis | 117050017        | Lens-induced iridocyclitis                             |
| Uveitis | 6023251000006110 | Idiopathic choroiditis                                 |
| Uveitis | 6045901000006110 | Peripheral uveoretinitis                               |
| Uveitis | 7526751000006110 | Paramacular focal retinitis                            |
| Uveitis | 129342012        | Syphilitic disseminated retinochoroiditis              |
| Uveitis | 129405018        | Iridocyclitis  |
| Uveitis | 129408016        | Anterior uveitis                                       |
| Uveitis | 6902361000006110 | MAI choroiditis  |
| Uveitis | 6861161000006110 | Uveitis due to lepromatous leprosy                     |
| Uveitis | 2938061000006110 | Disseminated choroiditis                               |
| Uveitis | 297898017        | Disseminated posterior pole chorioretinitis            |
| Uveitis | 7256181000006110 | Reactivation of toxoplasmosis chorioretinitis          |
| Uveitis | 297979015        | Harada's disease                                       |
| Uveitis | 3185161000006110 | Acute cyclitis   |
| Uveitis | 6880891000006110 | Subretinal fibrosis and uveitis syndrome               |
| Uveitis | 6969041000006110 | Choroiditis due to Cryptococcus neoformans             |
| Uveitis | 6797971000006110 | Iritis with inflammatory bowel disease                 |
| Uveitis | 4771781000006110 | Generalized disseminated chorioretinitis               |
| Uveitis | 458789018        | Posterior cyclitis                                     |
| Uveitis | 8111831000006110 | Bilateral acute iritis                                 |
| Uveitis | 297907017        | Posterior uveitis                                      |
| Uveitis | 4060941000006110 | Granulomatous choroiditis                              |
| Uveitis | 5030321000006110 | Onchocerca chorioretinitis                             |
| Uveitis | 8111871000006110 | Acute iridocyclitis of both eyes                       |
| Uveitis | 297900015        | General disseminated chorioretinitis                   |
| Uveitis | 6905231000006110 | Human T-cell Lymphoma Virus Type -1 associated uveitis |
| Uveitis | 18585010         | Herpes zoster iridocyclitis                            |
| Uveitis | 6873971000006110 | Rifabutin-induced anterior uveitis                     |
| Uveitis | 7690851000006110 | Chorioretinitis caused by Cytomegalovirus              |
| Uveitis | 297980017        | Certain types of cyclitis NOS                          |
| Uveitis | 6964781000006110 | Herpes zoster retinitis                                |
| Uveitis | 3540931000006110 | Subacute iridocyclitis                                 |
| Uveitis | 3177461000006110 | Macular focal retinitis AND retinochoroiditis          |
| Uveitis | 297887018        | Unspecified focal chorioretinitis                      |
| Uveitis | 4061241000006110 | Phacotoxic uveitis                                     |
| Uveitis | 3280171000006110 | Tuberculous disseminated chorioretinitis               |
| Uveitis | 297958015        | Unspecified acute iridocyclitis                        |
| Uveitis | 6864631000006110 | MCP - multifocal choroiditis and panuveitis syndrome   |
| Uveitis | 7956661000006110 | Primary anterior uveitis                               |
| Uveitis | 8106461000006110 | Syphilitic choroiditis                                 |
| Uveitis | 297964010        | Diabetic iritis  |
| Uveitis | 2658371000006110 | Congenital syphilitic choroiditis                      |
| Uveitis | 394511000006113  | [X]Iridocyclitis/infectious and parasitic diseases CE  |
| Uveitis | 763141000006118  | Focal macular retinochoroiditis                        |
| Uveitis | 6041591000006110 | Inactive toxoplasmosis chorioretinitis                 |

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| Uveitis | 299461019         | [X]Iridocyclitis in other diseases classified elsewhere  |
| Uveitis | 3335741000006110  | Disseminated choroiditis AND chorioretinitis, posterior pole   |
| Uveitis | 2658381000006110  | Congenital syphilitic chorioretinitis  |
| Uveitis | 3948401000006110  | Infectious secondary iridocyclitis   |
| Uveitis | 3251001000006110  | Juxtapapillary focal retinitis AND retinochoroiditis   |
| Uveitis | 297895019         | Focal chorioretinitis or retinochoroiditis NOS   |
| Uveitis | 297904012         | Other chorioretinitis and retinochoroiditis  |
| Uveitis | 297899013         | Disseminated peripheral chorioretinitis<br>Generalised disseminated choroiditis AND chorioretinitis with acute<br>necrosis |
| Uveitis | 6349041000006110  |  |
| Uveitis | 297903018         | Disseminated chorioretinitis and retinochoroiditis NOS   |
| Uveitis | 5029741000006110  | Idiopathic anterior uveitis  |
| Uveitis | 6045891000006110  | Peripheral uveitis   |
| Uveitis | 299471017         | Chorioretinitis  |
| Uveitis | 62891000006110    | Vogt-Koyanagi-Harada disease   |
| Uveitis | 8108091000006110  | Macular focal choroiditis  |
| Uveitis | 21698018          | Primary iridocyclitis  |
| Uveitis | 6797801000006110  | Syphilitic retinitis   |
| Uveitis | 6205331000006110  | Fungal choroiditis   |
| Uveitis | 297902011         | Pigmented epithelial disseminated retinitis  |
| Uveitis | 6845451000006110  | Brucellosis uveitis  |
| Uveitis | 1231652019        | Peripheral focal chorioretinitis   |
| Uveitis | 6041571000006110  | Post-traumatic uveitis   |
| Uveitis | 3645911000006110  | Lens-induced iridocyclitis   |
| Uveitis | 6023261000006110  | Idiopathic retinitis   |
| Uveitis | 3422501000006110  | Peripheral focal choroiditis AND chorioretinitis   |
| Uveitis | 7526801000006110  | Focal choroiditis of posterior pole of eye   |
| Uveitis | 6902351000006110  | Mycobacterium avium intracellulare group choroiditis   |
| Uveitis | 71731000006116    | Uveitis  |
| Uveitis | 3635101000006110  | Peripheral disseminated choroiditis AND chorioretinitis  |
| Uveitis | 6905241000006110  | HTLV-1 associated uveitis  |
| Uveitis | 16007016          | Gonococcal iridocyclitis   |
| Uveitis | 6954971000006110  | Herpetic iridocyclitis   |
| Uveitis | 6927831000006110  | Tubulointerstitial nephritis with uveitis syndrome   |
| Uveitis | 8467471000006110  | Iridocyclitis due to tuberculosis  |
| Uveitis | 297906014         | Retinitis  |
| Uveitis | 6905541000006110  | Cryptococcal choroiditis   |
| Uveitis | 6205011000006110  | Focal retinitis  |
| Uveitis | 4744811000006110  | Toxoplasmosis chorioretinitis  |
| Uveitis | 3901751000006110  | Uveitis-rheumatoid arthritis syndrome  |
| Uveitis | 125588013         | Panuveitis   |
| Uveitis | 2577961000006110  | Acute iridocyclitis  |
| Uveitis | 12049781000000000 | Idiopathic panuveitis  |
| Uveitis | 287636016         | Histoplasmosis with retinitis  |
| Uveitis | 763131000006111   | Focal juxtapapillary retinitis   |



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| Uveitis | 8113261000006110  | Sarcoid iridocyclitis  |
| Uveitis | 12079101000000000 | Iritis of left eye co-occurrent and due to diabetes mellitus |
| Uveitis | 12627161000000000 | Secondary angle closure glaucoma due to uveitis              |
| Uveitis | 72069017          | Gouty iritis   |
| Uveitis | 6041581000006110  | Acute toxoplasmosis chorioretinitis                          |
| Uveitis | 8107881000006110  | Acute iritis of right eye                                    |
| Uveitis | 5030301000006110  | Bacterial chorioretinitis                                    |
| Uveitis | 6894321000006110  | Toxoplasma retinitis   |
| Uveitis | 5030251000006110  | Viral retinitis  |
| Uveitis | 12220711000000000 | Iritis co-occurrent and due to diabetes mellitus             |
| Uveitis | 12079131000000000 | Bilateral diabetic iritis                                    |
| Uveitis | 883281000006117   | Acute iritis (iritidocyclitis)                               |
| Uveitis | 4061231000006110  | Phacoantigenic uveitis                                       |
| Uveitis | 7514231000006110  | Generalised disseminated choroiditis                         |
| Uveitis | 6045871000006110  | Intermediate uveitis   |
| Uveitis | 6797951000006110  | Panuveitis in Behcet syndrome                                |
| Uveitis | 6797891000006110  | Infective uveitis  |
| Uveitis | 7092041000006110  | Uveitis due to ranibizumab                                   |
| Uveitis | 6892931000006110  | Immune recovery uveitis                                      |
| Uveitis | 12728121000000000 | Choroiditis NOS  |
| Uveitis | 399442017         | Unspecified iridocyclitis                                    |
| Uveitis | 4060911000006110  | Sclerouveitis  |
| Uveitis | 3948411000006110  | Infectious anterior uveitis                                  |
| Uveitis | 297959011         | Unspecified subacute iridocyclitis                           |
| Uveitis | 2857871000006110  | CMV - Cytomegalovirus retinitis                              |
| Uveitis | 8109971000006110  | Gonococcal iritis  |
| Uveitis | 2530301000006110  | Monofocal choroiditis  |
| Uveitis | 12625311000000000 | Secondary ocular hypertension due to uveitis                 |
| Uveitis | 151821000006115   | Secondary noninfected iridocyclitis                          |
| Uveitis | 6864611000006110  | MFC-multifocal choroiditis                                   |
| Uveitis | 6847981000006110  | Cidofovir-induced anterior uveitis                           |
| Uveitis | 2826731000006110  | Herpetic iritis  |
| Uveitis | 8109751000006110  | Acute iritis of left eye                                     |
| Uveitis | 989051000006110   | Acute iritis (iritidocyclitis)                               |
| Uveitis | 4744021000006110  | American histoplasmosis with retinitis                       |
| Uveitis | 297905013         | Choroiditis  |
| Uveitis | 2600621000006110  | Juxtapapillary focal choroiditis AND chorioretinitis         |
| Uveitis | 4771591000006110  | Doyne's honeycomb choroiditis                                |
| Uveitis | 6845461000006110  | Uveitis due to brucellosis                                   |
| Uveitis | 7690871000006110  | Iritis caused by Treponema pallidum                          |
| Uveitis | 8106431000006110  | Toxoplasmosis choroiditis                                    |
| Uveitis | 12079081000000000 | Iritis of right eye due to diabetes mellitus                 |
| Uveitis | 2530291000006110  | Focal choroiditis  |
| Uveitis | 12079091000000000 | Diabetic iritis of left eye                                  |
| Uveitis | 286317012         | Tuberculous chorioretinitis                                  |

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| Uveitis | 50329015          | Secondary syphilitic iridocyclitis                                     |
| Uveitis | 3540921000006110  | Subacute anterior uveitis  |
| Uveitis | 3258311000006110  | Noninfectious secondary iridocyclitis                                  |
| Uveitis | 931901000006118   | Choroiditis  |
| Uveitis | 6798301000006110  | Lens-associated uveitis  |
| Uveitis | 297965011         | Acute or subacute iritis NOS   |
| Uveitis | 297893014         | Other posterior pole focal retinitis                                   |
| Uveitis | 8107891000006110  | Acute anterior uveitis of right eye                                    |
| Uveitis | 297891011         | Other posterior pole focal chorioretinitis                             |
| Uveitis | 6797921000006110  | Iritis in Behcet's syndrome  |
| Uveitis | 5029731000006110  | Anterior uveitis idiopathic  |
| Uveitis | 8111841000006110  | Acute iritis of bilateral eyes   |
| Uveitis | 7526761000006110  | Peripheral focal retinitis   |
| Uveitis | 2857861000006110  | Cytomegalovirus retinitis  |
| Uveitis | 6798281000006110  | Lens-induced uveitis   |
| Uveitis | 4771791000006110  | Generalised disseminated chorioretinitis                               |
| Uveitis | 8106421000006110  | Toxoplasma choroiditis   |
| Uveitis | 12079121000000000 | Bilateral iritis due to diabetes mellitus                              |
| Uveitis | 297894015         | Peripheral focal retinochoroiditis                                     |
| Uveitis | 6797981000006110  | Iritis with ulcerative colitis   |
| Uveitis | 12730081000000000 | Unspecified acute iridocyclitis  |
| Uveitis | 7690841000006110  | Cytomegalovirus chorioretinitis  |
| Uveitis | 6797881000006110  | Leptospiral uveitis  |
| Uveitis | 3729601000006110  | Diffuse uveitis  |
| Uveitis | 287862010         | Toxoplasma chorioretinitis   |
| Uveitis | 297913014         | Other chorioretinitis or retinochoroiditis NOS                         |
| Uveitis | 3089071000006110  | Peripheral focal retinitis AND retinochoroiditis                       |
| Uveitis | 12325561000000000 | Toxoplasmosis retinitis  |
| Uveitis | 6205401000006110  | Fungal chorioretinitis   |
| Uveitis | 7528181000006110  | Granulomatous inflammatory arthritis, dermatitis and uveitis, familial |
| Uveitis | 2728651000006110  | Subacute iritis  |
| Uveitis | 6527801000006110  | Uveitis-glaucoma-hyphema syndrome                                      |
| Uveitis | 2577951000006110  | Acute anterior uveitis   |
| Uveitis | 2535612016        | Multifocal choroiditis   |
| Uveitis | 4771961000006110  | Secondary non-infected iridocyclitis                                   |
| Uveitis | 12627171000000000 | Angle closure glaucoma with uveitis                                    |
| Uveitis | 3177451000006110  | Paramacular focal retinitis AND retinochoroiditis                      |
| Uveitis | 6880901000006110  | SFU-subretinal fibrosis and uveitis syndrome                           |
| Uveitis | 399440013         | Acute and subacute iridocyclitis                                       |
| Uveitis | 7523191000006110  | Juxtapapillary focal retinitis   |
| Uveitis | 287232010         | Uveitis due to secondary syphilis                                      |
| Uveitis | 4060931000006110  | Granulomatous chorioretinitis  |
| Uveitis | 4061251000006110  | Phacolytic uveitis   |
| Uveitis | 6868321000006110  | Pamidronic acid-induced uveitis  |
| Uveitis | 4060961000006110  | Granulomatous retinitis  |

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| Uveitis | 2857841000006110  | Cytomegaloviral retinitis  |
| Uveitis | 7956841000006110  | Noninfectious panuveitis   |
| Uveitis | 299456016         | [X]Other iridocyclitis   |
| Uveitis | 2826721000006110  | Herpes simplex iritis  |
| Uveitis | 8068161000006110  | Infectious secondary iritis  |
| Uveitis | 6041561000006110  | Tuberculous uveitis  |
| Uveitis | 3177471000006110  | Macular focal chorioretinitis                                      |
| Uveitis | 3253121000006110  | Retinochoroiditis  |
| Uveitis | 5030171000006110  | Vitiliginous chorioretinitis                                       |
| Uveitis | 3341721000006110  | Focal retinitis AND retinochoroiditis of other posterior pole      |
| Uveitis | 2577971000006110  | AAU - acute anterior uveitis                                       |
| Uveitis | 8106411000006110  | Herpes zoster iritis   |
| Uveitis | 6527811000006110  | Uveitis-hyphema-glaucoma syndrome                                  |
| Uveitis | 625191000006111   | Disseminated chorioretinitis                                       |
| Uveitis | 5030331000006110  | Toxocara chorioretinitis   |
| Uveitis | 6797931000006110  | Iritis in Behcet syndrome  |
| Uveitis | 6383911000006110  | Posterior pole focal chorioretinitis                               |
| Uveitis | 5239321000006110  | Cheesy retinitis   |
| Uveitis | 6797941000006110  | Panuveitis in Behcet's syndrome                                    |
| Uveitis | 4771701000006110  | Juxtapapillary focal chorioretinitis                               |
| Uveitis | 287615018         | Histoplasma capsulatum with retinitis                              |
| Uveitis | 5501391000006110  | Non-infectious anterior uveitis                                    |
| Uveitis | 297973019         | Certain types of iridocyclitis                                     |
| Uveitis | 2516421000006110  | Solar retinitis  |
| Uveitis | 12627031000000000 | Secondary angle closure due to uveitis                             |
| Uveitis | 6862291000006110  | Metipranolol-induced anterior uveitis                              |
| Uveitis | 6797991000006110  | Iritis with Crohn's disease  |
| Uveitis | 6895381000006110  | Iritis in juvenile idiopathic arthritis                            |
| Uveitis | 6798001000006110  | Iritis with Crohn disease  |
| Uveitis | 12079111000000000 | Iritis of left eye due to diabetes mellitus                        |
| Uveitis | 6902681000006110  | Measles retinitis  |
| Uveitis | 8015511000006110  | Noninfectious secondary iritis                                     |
| Uveitis | 6895371000006110  | Anterior uveitis in juvenile idiopathic arthritis                  |
| Uveitis | 12079141000000000 | Iritis of bilateral eyes co-occurrent and due to diabetes mellitus |
| Uveitis | 5030161000006110  | Birdshot chorioretinitis   |
| Uveitis | 3781261000006110  | Disseminated retinochoroiditis                                     |
| Uveitis | 6797841000006110  | Lyme uveitis   |
| Uveitis | 6798401000006110  | Drug-induced uveitis   |
| Uveitis | 287235012         | Secondary syphilitic uveitis NOS                                   |
| Uveitis | 108146018         | Iritis   |
| Uveitis | 12626971000000000 | Secondary acute angle closure due to uveitis                       |
| Uveitis | 6797961000006110  | Iritis in psoriatic arthritis                                      |
| Uveitis | 3934741000006110  | Focal chorioretinitis due to acquired toxoplasmosis                |
| Uveitis | 3506321000006110  | Disseminated retinitis   |
| Uveitis | 8108111000006110  | Lens-induced iritis  |

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| Uveitis | 6349051000006110  | Generalized disseminated choroiditis AND chorioretinitis with acute necrosis |
| Uveitis | 763071000006113   | Focal chorioretinitis  |
| Uveitis | 7032391000006110  | Retinitis sclopetaria  |
| Uveitis | 76191012          | Pars planitis  |
| Uveitis | 6861151000006110  | Lepromatous anterior uveitis   |
| Uveitis | 7514241000006110  | Generalized disseminated choroiditis   |
| Uveitis | 6797871000006110  | Uveitis due to leptospirosis   |
| Uveitis | 12079071000000000 | Iritis of right eye co-occurrent and due to diabetes mellitus                |
| Uveitis | 6023241000006110  | Sarcoid chorioretinitis  |
| Uveitis | 6023101000006110  | Uveitis related cystoid macular edema  |
| Uveitis | 6798291000006110  | Phacogenic uveitis   |
| Uveitis | 6969031000006110  | Cryptococcus neoformans choroiditis  |
| Uveitis | 7834161000006110  | Optic disc swelling associated with uveitis                                  |
| Uveitis | 297901016         | Metastatic disseminated retinitis  |
| Uveitis | 6900941000006110  | Traumatic iritis   |
| Uveitis | 8111861000006110  | Acute anterior uveitis of bilateral eyes                                     |
| Uveitis | 2736171000006110  | Generalized disseminated choroiditis AND chorioretinitis                     |
| Uveitis | 17368014          | Congenital syphilitic choroiditis  |
| Uveitis | 7092061000006110  | Uveitis caused by ranibizumab  |
| Uveitis | 6023091000006110  | Uveitis related cystoid macular oedema                                       |
| Uveitis | 6864621000006110  | Multifocal choroiditis and panuveitis syndrome                               |
| Uveitis | 6023291000006110  | Syphilitic chorioretinitis   |
| Uveitis | 6023631000006110  | Tertiary syphilitic chorioretinitis  |
| Uveitis | 6908511000006110  | Cryptococcal retinitis   |
| Uveitis | 6205291000006110  | Parasitic chorioretinitis  |
| Uveitis | 6041611000006110  | Secondary open-angle glaucoma with uveitis                                   |
| Uveitis | 7514251000006110  | Peripheral disseminated choroiditis  |
| Uveitis | 170161000006113   | Choroiditis and retinitis  |
| Uveitis | 6046601000006110  | Postoperative uveitis  |
| Uveitis | 3220361000006110  | Focal choroiditis AND chorioretinitis of other posterior pole                |
| Uveitis | 7834151000006110  | Optic disc swelling co-occurrent with uveitis                                |
| Uveitis | 297888011         | Focal juxtapapillary choroiditis   |
| Uveitis | 12220721000000000 | Iritis due to diabetes mellitus  |
| Uveitis | 8108101000006110  | Lens induced iritis  |
| Uveitis | 6023561000006110  | Punctate inner choroiditis   |
| Uveitis | 7528171000006110  | Familial granulomatous inflammatory arthritis, dermatitis and uveitis        |
| Uveitis | 2751391000006110  | Focal retinochoroiditis  |
| Uveitis | 6888641000006110  | Punctate outer retinitis in acute Epstein-Barr virus infection               |
| Uveitis | 7690861000006110  | Syphilitic iritis  |
| Uveitis | 12079061000000000 | Diabetic iritis of right eye   |
| Uveitis | 7032381000006110  | Retinitis sclopetaria  |
| Uveitis | 7734151000006110  | Retinitis punctata albescens   |
| Uveitis | 3499391000006110  | Metastatic disseminated retinitis AND retinochoroiditis                      |
| Uveitis | 7526771000006110  | Paramacular focal retinochoroiditis  |

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| Uveitis                | 4062461000006110  | Vitritis   |
| Uveitis                | 6874111000006110  | Sarcoid uveitis  |
| Uveitis                | 23218017          | Herpes simplex iridocyclitis   |
| Uveitis                | 297897010         | Unspecified disseminated chorioretinitis                             |
| Uveitis                | 347653014         | Retinitis proliferans  |
| Uveitis                | 7514261000006110  | Posterior pole disseminated choroiditis                              |
| Uveitis                | 2516441000006110  | Foveomacular retinitis   |
| Uveitis                | 6205261000006110  | Parasitic choroiditis  |
| Uveitis                | 8111881000006110  | Acute anterior uveitis of both eyes                                  |
| Uveitis                | 297962014         | Secondary infected iridocyclitis                                     |
| Uveitis                | 5030311000006110  | Candida retinitis  |
| Uveitis                | 6898751000006110  | Cryptococcal chorioretinitis   |
| Uveitis                | 7092051000006110  | Ranibizumab-induced uveitis  |
| Uveitis                | 3105051000006110  | Subacute cyclitis  |
| Uveitis                | 7526741000006110  | Macular focal retinitis  |
| Uveitis                | 287626012         | Histoplasma duboisii with retinitis                                  |
| Uveitis                | 745731000006116   | Acute iritis   |
| Uveitis                | 12625321000000000 | Ocular hypertension with uveitis                                     |
| Uveitis                | 12626981000000000 | Acute angle closure with uveitis                                     |
| Uveitis                | 6023181000006110  | Multifocal inner choroiditis   |
| Uveitis                | 6927841000006110  | TINU - Tubulointerstitial nephritis with uveitis syndrome            |
| Uveitis                | 3949781000006110  | Pigment epitheliopathy, disseminated retinitis AND retinochoroiditis |
| Uveitis                | 6895391000006110  | Anterior uveitis in juvenile rheumatoid arthritis                    |
| Uveitis                | 12627041000000000 | Angle closure with uveitis   |
| Uveitis                | 7526721000006110  | Peripheral focal choroiditis   |
| Uveitis                | 7273611000006110  | Pneumocystis jirovecii choroiditis                                   |
| Uveitis                | 6906361000006110  | Chorioretinitis with coccidioidmycosis                               |
| Uveitis                | 125088015         | Sympathetic uveitis  |
| Uveitis                | 7523181000006110  | Focal retinitis of posterior pole of eye                             |
| Vitreous<br>Detachment | 5238951000006110  | PVD - Posterior vitreous detachment                                  |
| Vitreous<br>Detachment | 89378011          | Vitreous detachment  |
| Vitreous<br>Detachment | 368991016         | Posterior vitreous detachment  |

### **Clinical code lists in GOLD**

| <b>Condition</b>       | <b>medcode</b> | <b>Read Term</b>                           |
|------------------------|----------------|--|
| Amyloidosis            | 54010          | Pulmonary amyloidosis                      |
| Amyloidosis            | 107743         | [X]Other amyloidosis                       |
| Amyloidosis            | 105580         | Senile systemic amyloidosis                |
| Amyloidosis            | 47922          | Nephrotic syndrome in amyloidosis          |
| Amyloidosis            | 5554           | Amyloidosis                                |
| Amyloidosis            | 109747         | Cutaneous amyloidosis                      |
| Amyloidosis            | 94141          | Arthropathy in amyloidosis                 |
| Amyloidosis            | 64651          | Secondary amyloidosis                      |
| Amyloidosis            | 105398         | Senile cardiac amyloidosis                 |
| Amyloidosis            | 110588         | [X]Heredofamilial amyloidosis, unspecified |
| Amyloidosis            | 107899         | Cerebral amyloidosis                       |
| Amyloidosis            | 53970          | Primary amyloidosis NEC                    |
| Amyloidosis            | 43305          | Amyloidosis NOS                            |
| Amyloidosis            | 107673         | Bullous cutaneous amyloidosis              |
| Amyloidosis            | 109336         | Cerebrovascular amyloidosis                |
| Amyloidosis            | 48840          | Other specified amyloidosis                |
| Amyloidosis            | 54283          | Organ limited non-hereditary amyloidosis   |
| Amyloidosis            | 108308         | Amyloidosis of stomach                     |
| Amyloidosis            | 67734          | Heredofamilial amyloidosis, unspecified    |
| Amyloidosis            | 107595         | Amyloid A amyloidosis                      |
| Amyloidosis            | 109631         | Conjunctival amyloidosis                   |
| Amyloidosis            | 100492         | AL amyloidosis                             |
| Amyloidosis            | 106196         | Amyloidosis of intestine                   |
| Amyloidosis            | 68112          | Nephropathic amyloidosis                   |
| Amyloidosis            | 105798         | Cardiac amyloidosis                        |
| Amyloidosis            | 66336          | Polyneuropathy in amyloidosis              |
| Amyloidosis            | 105978         | Beta-2 microglobulin amyloidosis           |
| Amyloidosis            | 110512         | Sporadic primary amyloidosis               |
| Amyloidosis            | 45825          | Amyloidosis of skin                        |
| Aphakia                | 64214          | Aphakia and other disorders of lens NOS    |
| Aphakia                | 16473          | Aphakia and other disorders of lens        |
| Aphakia                | 97515          | Spectacles for aphakia                     |
| Aphakia                | 1663           | Aphakia                                    |
| Carotid Artery Disease | 2652           | Carotid artery stenosis                    |
| Carotid Artery Disease | 51257          | Ultrasound of carotid artery               |
| Carotid Artery Disease | 44765          | Carotid artery syndrome hemispheric        |
| Carotid Artery Disease | 2659           | Arteriography of carotid artery            |
| Carotid Artery Disease | 19824          | Carotid artery angiography                 |
| Carotid Artery Disease | 2156           | Stenosis, carotid artery                   |
| Carotid Artery Disease | 4152           | Thrombosis, carotid artery                 |
| Carotid Artery Disease | 26888          | Referral for carotid doppler               |
| Carotid Artery Disease | 22677          | Carotid artery disease                     |

|                        |        |  |
|------------------------|--------|--|
| Carotid Artery Disease | 13995  | Carotid artery doppler normal                              |
| Carotid Artery Disease | 41818  | Carotid A angiogram abnormal                               |
| Carotid Artery Disease | 29973  | Percutaneous transluminal angioplasty of carotid artery    |
| Carotid Artery Disease | 58181  | Carotid A angiogram requested                              |
| Carotid Artery Disease | 28546  | Carotid artery doppler declined                            |
| Carotid Artery Disease | 12413  | Carotid artery doppler abnormal                            |
| Carotid Artery Disease | 20016  | Carotid A angiogram normal                                 |
| Carotid Artery Disease | 35916  | Endarterectomy and patch repair of carotid artery          |
| Carotid Artery Disease | 13985  | Carotid artery angiogr-general                             |
| Carotid Artery Disease | 49693  | Carotid art.angiog-general NOS                             |
| Carotid Artery Disease | 47580  | Percutaneous transluminal insertion stent carotid artery   |
| Carotid Artery Disease | 105738 | Carotid territory transient ischaemic attack               |
| Carotid Artery Disease | 18366  | Carotid artery doppler assessment                          |
| Carotid Artery Disease | 2654   | Endarterectomy of carotid artery NEC                       |
| Carotid Artery Disease | 12733  | Carotid endarterectomy and patch                           |
| Carotid Artery Disease | 4240   | Carotid artery occlusion                                   |
| Carotid Artery Disease | 37199  | Carotid artery atherosclerosis                             |
| Carotid Artery Disease | 40347  | Open embolectomy of carotid artery                         |
| Carotid Artery Disease | 63689  | Carotid ultrasound not indicated                           |
| Cataract               | 24467  | Unspecified secondary cataract                             |
| Cataract               | 19371  | Cataract in degenerative disorder                          |
| Cataract               | 89585  | Other after cataract with vision normal                    |
| Cataract               | 38641  | Discission of cataract                                     |
| Cataract               | 7257   | Cortical cataract  |
| Cataract               | 296    | Cataract   |
| Cataract               | 6547   | O/E - Right cataract present                               |
| Cataract               | 64196  | Cataract observation                                       |
| Cataract               | 5518   | H/O: cataract  |
| Cataract               | 50638  | Traumatic cataract NOS                                     |
| Cataract               | 49085  | Other senile cataract                                      |
| Cataract               | 6330   | Extracapsular extraction of cataract                       |
| Cataract               | 18089  | Capsular cataract  |
| Cataract               | 10497  | Phakoemulsification lens insertion prosthetic replacement  |
| Cataract               | 27898  | Blue dot cataract  |
| Cataract               | 44260  | Insulin dependent diabetes mellitus with diabetic cataract |
| Cataract               | 2301   | Phakoemulsification of lens                                |
| Cataract               | 57805  | Unspecified presenile cataract                             |
| Cataract               | 101939 | [X]Other senile cataract                                   |
| Cataract               | 4260   | Intracapsular extraction of cataract                       |
| Cataract               | 11537  | Cataract screen  |
| Cataract               | 3897   | Traumatic cataract   |
| Cataract               | 5325   | Posterior subcapsular polar senile cataract                |
| Cataract               | 63640  | Morgagni cataract  |
| Cataract               | 10659  | Diabetic cataract  |
| Cataract               | 11767  | Referral for cataract extraction                           |

|          |        |   |
|----------|--------|---|
| Cataract | 100770 | Insulin dependent diabetes mellitus with diabetic cataract  |
| Cataract | 48228  | Cataract secondary to ocular disease                        |
| Cataract | 9931   | O/E - Left cataract present                                 |
| Cataract | 45952  | Tetanic cataract  |
| Cataract | 7793   | Nuclear cataract  |
| Cataract | 11255  | Subcapsular cataract  |
| Cataract | 22022  | Cortical senile cataract                                    |
| Cataract | 10591  | Phacoemulsification lens insertion prosthetic replacement   |
| Cataract | 88738  | Capsular or subcapsular cataract NOS                        |
| Cataract | 51162  | Hypermature cataract  |
| Cataract | 17545  | Type I diabetes mellitus with diabetic cataract             |
| Cataract | 29770  | Senile cataract NOS   |
| Cataract | 41668  | Infantile, juvenile and presenile cataracts                 |
| Cataract | 94348  | Cataract operation planned                                  |
| Cataract | 92358  | Anterior subcapsular polar senile cataract                  |
| Cataract | 103508 | Cataract extraction and insertion of intraocular lens       |
| Cataract | 105971 | Bullous aphakic keratopathy following cataract surgery      |
| Cataract | 28515  | H/O: L cataract extraction                                  |
| Cataract | 33793  | Total, mature senile cataract                               |
| Cataract | 62188  | Unspecified cataracta complicata                            |
| Cataract | 59125  | Anterior subcapsular polar cataract                         |
| Cataract | 44487  | After cataract NOS  |
| Cataract | 49554  | Type 1 diabetes mellitus with diabetic cataract             |
| Cataract | 104553 | Keratopathy following cataract surgery                      |
| Cataract | 49297  | [X]Cataract in other diseases classified elsewhere          |
| Cataract | 44779  | Type 2 diabetes mellitus with diabetic cataract             |
| Cataract | 114666 | Partial resolved traumatic cataract                         |
| Cataract | 33482  | After cataract  |
| Cataract | 69278  | Non-insulin depend diabetes mellitus with diabetic cataract |
| Cataract | 703    | Bilateral cataracts   |
| Cataract | 4358   | Other cataract  |
| Cataract | 59914  | Capsular and subcapsular cataract                           |
| Cataract | 11970  | H/O: Bilateral cataract extraction                          |
| Cataract | 58625  | Cataract associated with other syndromes                    |
| Cataract | 73419  | Total traumatic cataract                                    |
| Cataract | 70257  | Combined senile cataract                                    |
| Cataract | 62605  | Unspecified traumatic cataract                              |
| Cataract | 26850  | After-cataract with vision obscured                         |
| Cataract | 44294  | Immature cortical cataract                                  |
| Cataract | 48148  | Incipient cataract NOS                                      |
| Cataract | 94430  | Cataract due to other disorder NOS                          |
| Cataract | 42452  | Vitreous syndrome following cataract surgery                |
| Cataract | 110400 | Type 1 diabetes mellitus with diabetic cataract             |
| Cataract | 54130  | Cataract in eye inflammatory disorder                       |
| Cataract | 6876   | Nuclear senile cataract                                     |



|                         |        |  |
|-------------------------|--------|--|
| Cataract                | 60883  | Myotonic cataract  |
| Cataract                | 71291  | Cataract due to other disorder   |
| Cataract                | 10010  | Senile cataract  |
| Cataract                | 4242   | Posterior subcapsular polar cataract   |
| Cataract                | 47566  | Unspecified senile cataract  |
| Cataract                | 94474  | Combined nonsenile cataract  |
| Cataract                | 23631  | Immature cataract NOS  |
| Cataract                | 70403  | Other nonsenile cataract   |
| Cataract                | 48192  | Type II diabetes mellitus with diabetic cataract   |
| Cataract                | 93727  | Type II diabetes mellitus with diabetic cataract   |
| Cataract                | 23883  | Needling of lens for cataract  |
| Cataract                | 70201  | [X]Other specified cataract  |
| Cataract                | 61325  | Cataract with neovascularization   |
| Cataract                | 58120  | Drug induced cataract  |
| Cataract                | 26097  | Punctate cataract  |
| Cataract                | 46169  | Cataract secondary to ocular disorder NOS  |
| Cataract                | 66093  | Radiation induced cataract   |
| Cataract                | 1622   | O/E - cataract present   |
| Cataract                | 4459   | [V]State following cataract extraction   |
| Cataract                | 15589  | Other cataract NOS   |
| Cataract                | 1974   | Phacoemulsification of lens  |
| Cataract                | 28513  | H/O: R cataract extraction   |
| Cataract                | 114694 | Cataract due to other physical inflammation  |
| Cataract                | 6317   | Cataract NOS   |
| Cataract                | 58078  | Nonsenile cataract NOS   |
| Cataract                | 50932  | Coronary cataract  |
| Cataract                | 5361   | Other extraction of cataract   |
| Cataract                | 44982  | Type 2 diabetes mellitus with diabetic cataract  |
| Cerebrovascular Disease | 6116   | CVA - Cerebrovascular accident unspecified<br>CVA - cerebrovascular accid due to intracerebral |
| Cerebrovascular Disease | 6960   | haemorrhage  |
| Cerebrovascular Disease | 15252  | Brainstem infarction NOS   |
| Cerebrovascular Disease | 70235  | Other open operation on carotid artery NOS   |
| Cerebrovascular Disease | 12413  | Carotid artery doppler abnormal  |
| Cerebrovascular Disease | 2883   | Closed traumatic subdural haemorrhage  |
| Cerebrovascular Disease | 4107   | Evacuation of extradural haematoma<br>Subarachnoid haemorrhage from carotid siphon and         |
| Cerebrovascular Disease | 56007  | bifurcation  |
| Cerebrovascular Disease | 7780   | Left sided CVA   |
| Cerebrovascular Disease | 3535   | Intracerebral haemorrhage NOS  |
| Cerebrovascular Disease | 18689  | Middle cerebral artery syndrome  |
| Cerebrovascular Disease | 91627  | [X]Cerebrl infarctn due/unspcf occlusn or sten/cerebrl artr                                    |
| Cerebrovascular Disease | 60102  | [SO]Internal carotid artery  |
| Cerebrovascular Disease | 2652   | Carotid artery stenosis  |
| Cerebrovascular Disease | 2417   | Vertebro-basilar insufficiency   |
| Cerebrovascular Disease | 31941  | Rupture of syphilitic cerebral aneurysm  |

|                         |       |  |
|-------------------------|-------|--|
| Cerebrovascular Disease | 5268  | Insufficiency - basilar artery   |
| Cerebrovascular Disease | 42279 | Arteriosclerotic dementia NOS  |
| Cerebrovascular Disease | 36717 | Cerebral infarction due to thrombosis of cerebral arteries                             |
| Cerebrovascular Disease | 40758 | Cereb infarct due unsp occlus/stenos precerebr arteries                                |
| Cerebrovascular Disease | 94482 | [X]Cereb infarct due unsp occlus/stenos precerebr arteries                             |
| Cerebrovascular Disease | 55602 | Occlusion and stenosis of cerebellar arteries  |
| Cerebrovascular Disease | 6305  | H/O: CVA   |
| Cerebrovascular Disease | 4152  | Thrombosis, carotid artery   |
| Cerebrovascular Disease | 1298  | CVA unspecified  |
| Cerebrovascular Disease | 18912 | Subdural haemorrhage NOS   |
| Cerebrovascular Disease | 4917  | Evacuation of subdural haematoma   |
| Cerebrovascular Disease | 73022 | Repair of carotid artery NEC   |
| Cerebrovascular Disease | 24385 | Chronic cerebral ischaemia   |
| Cerebrovascular Disease | 40347 | Open embolectomy of carotid artery   |
| Cerebrovascular Disease | 5185  | Lateral medullary syndrome   |
| Cerebrovascular Disease | 28077 | Traumatic cerebral haemorrhage   |
| Cerebrovascular Disease | 52241 | [SO]Carotid artery NEC   |
| Cerebrovascular Disease | 48149 | Sequelae of intracerebral haemorrhage  |
| Cerebrovascular Disease | 47642 | Wallenberg syndrome  |
| Cerebrovascular Disease | 7862  | Traumatic subdural haematoma   |
| Cerebrovascular Disease | 3149  | Cerebral infarction NOS  |
| Cerebrovascular Disease | 569   | Infarction - cerebral  |
| Cerebrovascular Disease | 6253  | Stroke unspecified   |
| Cerebrovascular Disease | 2418  | Cerebrovascular disease  |
| Cerebrovascular Disease | 42248 | Discharge from stroke serv   |
| Cerebrovascular Disease | 11039 | Excepted from stroke quality indicators: Patient unsuitable                            |
| Cerebrovascular Disease | 18604 | Stroke due to intracerebral haemorrhage  |
| Cerebrovascular Disease | 56458 | Ref to multidisciplinary stroke function improvement service                           |
| Cerebrovascular Disease | 10504 | Right sided cerebral infarction  |
| Cerebrovascular Disease | 10794 | Vertebrobasilar insufficiency  |
| Cerebrovascular Disease | 45421 | Closed traumatic extradural haemorrhage  |
| Cerebrovascular Disease | 2654  | Endarterectomy of carotid artery NEC   |
| Cerebrovascular Disease | 16507 | Intermittent cerebral ischaemia  |
| Cerebrovascular Disease | 36390 | Aneurysm of internal carotid artery  |
| Cerebrovascular Disease | 13567 | H/O: TIA   |
| Cerebrovascular Disease | 68366 | Reconstruction of vertebral artery<br>Cereb autosom dominant arteriop subcort infarcts |
| Cerebrovascular Disease | 9943  | leukoenceph  |
| Cerebrovascular Disease | 93770 | Percutaneous transluminal insertion of stent cerebral artery                           |
| Cerebrovascular Disease | 10962 | Exception reporting: stroke quality indicators   |
| Cerebrovascular Disease | 56912 | Arteriosclerotic dementia with delirium  |
| Cerebrovascular Disease | 30202 | Intracerebral haemorrhage, intraventricular  |
| Cerebrovascular Disease | 55247 | Impending cerebral ischaemia   |
| Cerebrovascular Disease | 15019 | Cerebral embolism  |
| Cerebrovascular Disease | 504   | Transient cerebral ischaemia   |

|                         |        |   |
|-------------------------|--------|---|
| Cerebrovascular Disease | 8837   | Cerebral arterial occlusion                                 |
| Cerebrovascular Disease | 27975  | Cerebral infarction due to embolism of cerebral arteries    |
| Cerebrovascular Disease | 19201  | Right sided intracerebral haemorrhage, unspecified          |
| Cerebrovascular Disease | 23671  | Cerebral infarct due to thrombosis of precerebral arteries  |
| Cerebrovascular Disease | 19477  | Arteriosclerotic dementia                                   |
| Cerebrovascular Disease | 68069  | Endovascular repair of carotid artery                       |
| Cerebrovascular Disease | 50241  | Anterior spinal and vertebral artery compression syndromes  |
| Cerebrovascular Disease | 22447  | [SO]Internal carotid artery                                 |
| Cerebrovascular Disease | 8443   | Brain stem stroke syndrome                                  |
| Cerebrovascular Disease | 19348  | [V]Personal history of stroke                               |
| Cerebrovascular Disease | 55467  | Arteriosclerotic dementia with paranoia                     |
| Cerebrovascular Disease | 71274  | Occlusion+stenosis of multiple and bilat cerebral arteries  |
| Cerebrovascular Disease | 46545  | Cerebral haemorrhage following injury NOS                   |
| Cerebrovascular Disease | 96630  | [X]Intracerebral haemorrhage in hemisphere, unspecified     |
| Cerebrovascular Disease | 100015 | Transient ischaemic attack clinical management plan         |
| Cerebrovascular Disease | 8181   | Traumatic subdural haemorrhage                              |
| Cerebrovascular Disease | 65770  | Occlusion and stenosis of posterior cerebral artery         |
| Cerebrovascular Disease | 31595  | Cortical haemorrhage  |
| Cerebrovascular Disease | 28314  | Left sided intracerebral haemorrhage, unspecified           |
| Cerebrovascular Disease | 18411  | Traumatic extradural haematoma                              |
| Cerebrovascular Disease | 6228   | Sequelae of stroke,not specfd as h'morrhage or infarction   |
| Cerebrovascular Disease | 51311  | Other specified cerebrovascular disease                     |
| Cerebrovascular Disease | 28914  | Haemorrhagic stroke monitoring                              |
| Cerebrovascular Disease | 71585  | Precerebral artery occlusion NOS                            |
| Cerebrovascular Disease | 98204  | [SO]Branch of external carotid artery                       |
| Cerebrovascular Disease | 29973  | Percutaneous transluminal angioplasty of carotid artery     |
| Cerebrovascular Disease | 20510  | [SO]Carotid body  |
| Cerebrovascular Disease | 53745  | [X]Other cerebral infarction                                |
| Cerebrovascular Disease | 1469   | Stroke and cerebrovascular accident unspecified             |
| Cerebrovascular Disease | 20672  | Reconstruction of carotid artery                            |
| Cerebrovascular Disease | 91775  | Intracranial bypass from carotid artery NEC                 |
| Cerebrovascular Disease | 17960  | Carotid, cerebral and subclavian artery operations          |
| Cerebrovascular Disease | 93134  | High-flow inter extrac intrac byp ext carot art mid cer art |
| Cerebrovascular Disease | 51759  | Occlusion and stenosis of middle cerebral artery            |
| Cerebrovascular Disease | 17322  | Cerebellar stroke syndrome                                  |
| Cerebrovascular Disease | 46316  | Basal nucleus haemorrhage                                   |
| Cerebrovascular Disease | 19260  | Posterior cerebral artery syndrome                          |
| Cerebrovascular Disease | 41818  | Carotid A angiogram abnormal                                |
| Cerebrovascular Disease | 34135  | H/O: CVA/stroke   |
| Cerebrovascular Disease | 55074  | Percutaneous transluminal angioplasty of vertebral artery   |
| Cerebrovascular Disease | 68905  | Percutaneous transluminal embolectomy of vertebral artery   |
| Cerebrovascular Disease | 53810  | [X]Other intracerebral haemorrhage                          |
| Cerebrovascular Disease | 37199  | Carotid artery atherosclerosis                              |
| Cerebrovascular Disease | 7138   | [V]Personal history of cerebrovascular accident (CVA)       |
| Cerebrovascular Disease | 21118  | Vertebro-basilar artery syndrome                            |

|                         |        |   |
|-------------------------|--------|---|
| Cerebrovascular Disease | 90572  | [X]Occlusion and stenosis of other precerebral arteries     |
| Cerebrovascular Disease | 43451  | Sequelae of other nontraumatic intracranial haemorrhage     |
| Cerebrovascular Disease | 33543  | Cerebrl infarctn due/unspcf occlusn or sten/cerebrl artr    |
| Cerebrovascular Disease | 37493  | Other cerebrovascular disease NOS                           |
| Cerebrovascular Disease | 16517  | Cerebral thrombosis   |
| Cerebrovascular Disease | 47580  | Percutaneous transluminal insertion stent carotid artery    |
| Cerebrovascular Disease | 11074  | Excepted from stroke quality indicators: Informed dissent   |
| Cerebrovascular Disease | 15788  | Transient cerebral ischaemia NOS                            |
| Cerebrovascular Disease | 40098  | Suspected cerebrovascular disease                           |
| Cerebrovascular Disease | 10062  | Cerebrovascular disease NOS                                 |
| Cerebrovascular Disease | 30045  | External capsule haemorrhage                                |
| Cerebrovascular Disease | 57315  | Intracerebral haemorrhage, multiple localized               |
| Cerebrovascular Disease | 52246  | Stroke group member   |
| Cerebrovascular Disease | 25910  | Transluminal operations on carotid artery                   |
| Cerebrovascular Disease | 44023  | Other specified other open operation on carotid artery      |
| Cerebrovascular Disease | 8659   | [SO]Carotid artery  |
| Cerebrovascular Disease | 51504  | Epidural haemorrhage  |
| Cerebrovascular Disease | 73471  | Open traumatic extradural haemorrhage                       |
| Cerebrovascular Disease | 101251 | [V]Personal history of transient ischaemic attack           |
| Cerebrovascular Disease | 15007  | Replacement of carotid artery using graft                   |
| Cerebrovascular Disease | 4240   | Carotid artery occlusion                                    |
| Cerebrovascular Disease | 4273   | Subdural haemorrhage - nontraumatic                         |
| Cerebrovascular Disease | 39344  | Cereb infarct due cerebral venous thrombosis, nonpyogenic   |
| Cerebrovascular Disease | 19280  | Anterior cerebral artery syndrome                           |
| Cerebrovascular Disease | 45781  | Precerebral arterial occlusion                              |
| Cerebrovascular Disease | 31060  | Intracerebral haemorrhage in hemisphere, unspecified        |
| Cerebrovascular Disease | 43089  | Uncomplicated arteriosclerotic dementia                     |
| Cerebrovascular Disease | 17734  | Subdural haematoma - nontraumatic                           |
| Cerebrovascular Disease | 52008  | Other open operations on vertebral artery                   |
| Cerebrovascular Disease | 96117  | [SO]External carotid artery                                 |
| Cerebrovascular Disease | 97003  | Reconstruction of carotid artery NOS                        |
| Cerebrovascular Disease | 26424  | Infarction of basal ganglia                                 |
| Cerebrovascular Disease | 34758  | Cerebral embolus  |
| Cerebrovascular Disease | 9985   | Left sided cerebral infarction                              |
| Cerebrovascular Disease | 92036  | [X]Occlusion and stenosis of other cerebral arteries        |
| Cerebrovascular Disease | 24446  | Cerebral infarction due to embolism of precerebral arteries |
| Cerebrovascular Disease | 57527  | Occlusion and stenosis of anterior cerebral artery          |
| Cerebrovascular Disease | 39780  | Other open operations on carotid artery                     |
| Cerebrovascular Disease | 50594  | Multiple and bilateral precerebral artery syndromes         |
| Cerebrovascular Disease | 50678  | Aneurysm of external carotid artery                         |
| Cerebrovascular Disease | 40053  | Generalised ischaemic cerebrovascular disease NOS           |
| Cerebrovascular Disease | 34117  | Other cerebrovascular disease OS                            |
| Cerebrovascular Disease | 19354  | Other transient cerebral ischaemia                          |
| Cerebrovascular Disease | 25615  | Brainstem infarction  |
| Cerebrovascular Disease | 32447  | Basilar artery occlusion                                    |

|                         |       |   |
|-------------------------|-------|---|
| Cerebrovascular Disease | 31876 | Aneurysm of common carotid art  |
| Cerebrovascular Disease | 23361 | Late effects of cerebrovascular disease   |
| Cerebrovascular Disease | 56279 | Stroke in the puerperium  |
| Cerebrovascular Disease | 52968 | Other cerebral haemorrhage following injury   |
| Cerebrovascular Disease | 51326 | Other precerebral artery occlusion<br>Traumatic subdural haematoma without open intracranial<br>wound |
| Cerebrovascular Disease | 53980 |   |
| Cerebrovascular Disease | 47607 | CVA - cerebrovascular accident in the puerperium  |
| Cerebrovascular Disease | 12555 | Generalised ischaemic cerebrovascular disease NOS   |
| Cerebrovascular Disease | 43449 | Intracranial bypass to carotid artery   |
| Cerebrovascular Disease | 7912  | Pontine haemorrhage   |
| Cerebrovascular Disease | 70536 | Acute cerebrovascular insufficiency NOS   |
| Cerebrovascular Disease | 18687 | DNA - Did not attend stroke clinic  |
| Cerebrovascular Disease | 36579 | [SO]Common carotid artery   |
| Cerebrovascular Disease | 22677 | Carotid artery disease  |
| Cerebrovascular Disease | 57183 | Mitochond encephalopathy, lact acidosis & strokelike episode  |
| Cerebrovascular Disease | 44765 | Carotid artery syndrome hemispheric   |
| Cerebrovascular Disease | 42283 | Other cerebral haemorrhage following injury NOS   |
| Cerebrovascular Disease | 2752  | Vertebral column syndromes  |
| Cerebrovascular Disease | 17326 | Subarachnoid haemorrh from intracranial artery, unspecif  |
| Cerebrovascular Disease | 94351 | Open traumatic subdural haemorrhage   |
| Cerebrovascular Disease | 12833 | Right sided CVA   |
| Cerebrovascular Disease | 13577 | Other cerebrovascular disease   |
| Cerebrovascular Disease | 10792 | Stroke monitoring   |
| Cerebrovascular Disease | 6155  | Stroke due to cerebral arterial occlusion   |
| Cerebrovascular Disease | 40847 | Vertebral artery occlusion  |
| Cerebrovascular Disease | 5051  | Intracerebral haemorrhage   |
| Cerebrovascular Disease | 31704 | Occlusion/stenosis cerebral arts not result cerebral infarct  |
| Cerebrovascular Disease | 13564 | Cerebellar haemorrhage  |
| Cerebrovascular Disease | 9565  | [X]Arteriosclerotic dementia  |
| Cerebrovascular Disease | 12733 | Carotid endarterectomy and patch  |
| Cerebrovascular Disease | 43418 | Epidural haematoma following injury   |
| Cerebrovascular Disease | 20811 | Bypass to carotid artery NEC  |
| Cerebrovascular Disease | 12634 | Carotid artery dissection   |
| Cerebrovascular Disease | 55351 | Delivery of rehabilitation for stroke   |
| Cerebrovascular Disease | 73901 | [X]Cerebrovascular diseases   |
| Cerebrovascular Disease | 35916 | Endarterectomy and patch repair of carotid artery   |
| Cerebrovascular Disease | 20284 | Intracranial haemorrhage NOS  |
| Cerebrovascular Disease | 39403 | Sequelae of cerebral infarction   |
| Cerebrovascular Disease | 31805 | Other and unspecified intracranial haemorrhage  |
| Cerebrovascular Disease | 6569  | Subdural haemorrhage following injury   |
| Cerebrovascular Disease | 1895  | Transient cerebral ischaemia NOS  |
| Cerebrovascular Disease | 36178 | Extradural haemorrhage - nontraumatic   |
| Cerebrovascular Disease | 68329 | Other specified reconstruction of carotid artery  |
| Cerebrovascular Disease | 95347 | [X]Other vascular syndroms/brain in cerebrovasculr diseases   |

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| Cerebrovascular Disease | 43292  | Arteriosclerotic dementia with depression                    |
| Cerebrovascular Disease | 5682   | Cerebral haemorrhage following injury                        |
| Cerebrovascular Disease | 40338  | Internal capsule haemorrhage                                 |
| Cerebrovascular Disease | 41703  | Transluminal operation on carotid artery NOS                 |
| Cerebrovascular Disease | 2156   | Stenosis, carotid artery                                     |
| Cerebrovascular Disease | 32959  | Seen in stroke clinic  |
| Cerebrovascular Disease | 27661  | Extradural haemorrhage following injury                      |
| Cerebrovascular Disease | 66873  | H/O: Stroke in last year                                     |
| Cerebrovascular Disease | 91515  | [SO]Common carotid artery                                    |
| Cerebrovascular Disease | 5363   | CVA - cerebral artery occlusion                              |
| Cerebrovascular Disease | 23942  | Basilar artery syndrome                                      |
| Cerebrovascular Disease | 8692   | Cerebellar disease   |
| Cerebrovascular Disease | 89365  | Byp carot art anastom superfic tempor artery middle cere art |
| Cerebrovascular Disease | 68906  | Endarterectomy of vertebral artery NEC                       |
| Cerebrovascular Disease | 62661  | Other specified transluminal operation on carotid artery     |
| Cerebrovascular Disease | 18686  | Stroke/CVA annual review                                     |
| Cerebrovascular Disease | 63830  | Stenosis of precerebral arteries                             |
| Cerebrovascular Disease | 19412  | Subarachnoid haemorrhage from middle cerebral artery         |
| Cerebrovascular Disease | 5602   | Cerebellar infarction  |
| Cerebrovascular Disease | 5871   | H/O: stroke  |
| Cerebrovascular Disease | 41577  | H/O: cerebrovascular disease                                 |
| Cerebrovascular Disease | 33499  | Pure motor lacunar syndrome                                  |
| Cerebrovascular Disease | 57495  | Infarction - precerebral                                     |
| Cerebrovascular Disease | 63746  | [X]Other transnt cerebral ischaemic attacks+related syndroms |
| Cerebrovascular Disease | 98145  | ABCD2 stroke risk score                                      |
| Cerebrovascular Disease | 98188  | Small vessel cerebrovascular disease                         |
| Cerebrovascular Disease | 98642  | Multiple and bilateral precerebral arterial occlusion        |
| Cerebrovascular Disease | 99367  | [X]Other cerebrovascular disorders in diseases CE            |
| Cerebrovascular Disease | 22008  | Vertebral artery compression syndrome                        |
| Cerebrovascular Disease | 1433   | Transient ischaemic attack                                   |
| Cerebrovascular Disease | 96677  | Traumatic subdural haematoma with open intracranial wound    |
| Cerebrovascular Disease | 51138  | Sequelae/other + unspecified cerebrovascular diseases        |
| Cerebrovascular Disease | 33377  | Vertebral artery syndrome                                    |
| Charcot-Marie-Tooth     | 5584   | Charcot-Marie-Tooth disease                                  |
| Charcot-Marie-Tooth     | 108834 | Charcot-Marie-Tooth syndrome                                 |
| Charcot-Marie-Tooth     | 34698  | Charcot's atrophy  |
| Charcot-Marie-Tooth     | 11542  | Dejerine-Sottas disease                                      |
| Chronic Liver Disease   | 9494   | Biliary cirrhosis  |
| Chronic Liver Disease   | 40567  | Capsular portal cirrhosis                                    |
| Chronic Liver Disease   | 8206   | Pigmentary cirrhosis of liver                                |
| Chronic Liver Disease   | 58630  | Biliary cirrhosis NOS  |
| Chronic Liver Disease   | 73482  | Bacterial portal cirrhosis                                   |
| Chronic Liver Disease   | 44120  | Toxic liver disease with fibrosis and cirrhosis of liver     |
| Chronic Liver Disease   | 109540 | Zooparasitic portal cirrhosis                                |
| Chronic Liver Disease   | 71453  | Hepatic fibrosis   |

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| Chronic Liver Disease | 33597  | Other non-alcoholic chronic liver disease NOS                |
| Chronic Liver Disease | 8363   | Oesophageal varices in alcoholic cirrhosis of the liver      |
| Chronic Liver Disease | 6015   | [X]Other and unspecified cirrhosis of liver                  |
| Chronic Liver Disease | 9029   | Chronic active hepatitis                                     |
| Chronic Liver Disease | 60104  | Hepatic sclerosis  |
| Chronic Liver Disease | 92909  | Hypertrophic portal cirrhosis                                |
| Chronic Liver Disease | 106642 | Chronic viral hepatitis B                                    |
| Chronic Liver Disease | 17219  | Toxic liver disease with chronic persistent hepatitis        |
| Chronic Liver Disease | 10539  | Chronic liver disease NOS                                    |
| Chronic Liver Disease | 15424  | Secondary biliary cirrhosis                                  |
| Chronic Liver Disease | 42843  | Other non-alcoholic chronic liver disease                    |
| Chronic Liver Disease | 64750  | Toxic liver disease with chronic lobular hepatitis           |
| Chronic Liver Disease | 7957   | Autoimmune chronic active hepatitis                          |
| Chronic Liver Disease | 66534  | Chronic lobular hepatitis                                    |
| Chronic Liver Disease | 21713  | Alcoholic fibrosis and sclerosis of liver                    |
| Chronic Liver Disease | 48102  | Other sequelae of chronic liver disease                      |
| Chronic Liver Disease | 24813  | Chronic viral hepatitis B with delta-agent                   |
| Chronic Liver Disease | 18739  | Cryptogenic cirrhosis of liver                               |
| Chronic Liver Disease | 22841  | Macronodular cirrhosis of liver                              |
| Chronic Liver Disease | 26367  | Chronic viral hepatitis                                      |
| Chronic Liver Disease | 19512  | Glycogenosis with hepatic cirrhosis                          |
| Chronic Liver Disease | 58184  | Indian childhood cirrhosis                                   |
| Chronic Liver Disease | 34642  | Congenital hepatic fibrosis                                  |
| Chronic Liver Disease | 17330  | Alcoholic hepatic failure                                    |
| Chronic Liver Disease | 91591  | Biliary cirrhosis of children                                |
| Chronic Liver Disease | 16725  | Cirrhosis - non alcoholic                                    |
| Chronic Liver Disease | 53877  | Chronic hepatitis unspecified                                |
| Chronic Liver Disease | 4743   | Alcoholic cirrhosis of liver                                 |
| Chronic Liver Disease | 108819 | Congestive cirrhosis   |
| Chronic Liver Disease | 39351  | Toxic liver disease with chronic active hepatitis            |
| Chronic Liver Disease | 25383  | Hepatic fibrosis   |
| Chronic Liver Disease | 53480  | Recurrent hepatitis  |
| Chronic Liver Disease | 100253 | Xanthomatous portal cirrhosis                                |
| Chronic Liver Disease | 108343 | [X]Other chronic viral hepatitis                             |
| Chronic Liver Disease | 100592 | Hepatic fibrosis with hepatic sclerosis                      |
| Chronic Liver Disease | 44676  | Fatty portal cirrhosis                                       |
| Chronic Liver Disease | 1754   | Chronic hepatitis  |
| Chronic Liver Disease | 108800 | Liver abscess and chronic liver disease causing sequelae NOS |
| Chronic Liver Disease | 7885   | Alcoholic liver damage unspecified                           |
| Chronic Liver Disease | 7943   | Alcoholic hepatitis  |
| Chronic Liver Disease | 5638   | Primary biliary cirrhosis                                    |
| Chronic Liver Disease | 40963  | Portal fibrosis without cirrhosis                            |
| Chronic Liver Disease | 27438  | Cardiac portal cirrhosis                                     |
| Chronic Liver Disease | 55454  | Portal cirrhosis unspecified                                 |
| Chronic Liver Disease | 69204  | Multilobular portal cirrhosis                                |

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| Chronic Liver Disease  | 99898  | Chronic hepatitis annual review - enhanced services admin    |
| Chronic Liver Disease  | 16455  | Non-alcoholic cirrhosis NOS                                  |
| Chronic Liver Disease  | 48928  | Infectious cirrhosis NOS                                     |
| Chronic Liver Disease  | 32277  | Chronic viral hepatitis, unspecified                         |
| Chronic Liver Disease  | 110454 | Liver disease due to cystic fibrosis                         |
| Chronic Liver Disease  | 3450   | Diffuse nodular cirrhosis                                    |
| Chronic Liver Disease  | 41096  | Chronic viral hepatitis B without delta-agent                |
| Chronic Liver Disease  | 6863   | Cirrhosis and chronic liver disease                          |
| Chronic Liver Disease  | 15489  | Chronic hepatitis NOS  |
| Chronic Liver Disease  | 23578  | Chronic persistent hepatitis                                 |
| Chronic Liver Disease  | 26319  | Oesophageal varices in cirrhosis of the liver                |
| Chronic Liver Disease  | 7602   | Chronic alcoholic hepatitis                                  |
| Chronic Liver Disease  | 31897  | Liver abscess and sequelae of chronic liver disease          |
| Chronic Liver Disease  | 47257  | Portal cirrhosis   |
| Chronic Liver Disease  | 96664  | Juvenile portal cirrhosis                                    |
| Chronic Liver Disease  | 1755   | Chronic aggressive hepatitis                                 |
| Chronic Liver Disease  | 1638   | Cirrhosis of liver NOS                                       |
| Chronic Liver Disease  | 30586  | Chronic viral hepatitis C                                    |
| Chronic Liver Disease  | 100474 | Laennec's cirrhosis  |
| Chronic Liver Disease  | 68376  | Florid cirrhosis   |
| Chronic Liver Disease  | 102922 | Cystic fibrosis related cirrhosis                            |
| Coronary Heart Disease | 5254   | Double coronary vessel disease                               |
| Coronary Heart Disease | 3159   | Other specified other bypass of coronary artery              |
| Coronary Heart Disease | 23708  | Atrial septal defect/corr comp folow acut myocardal infarct  |
| Coronary Heart Disease | 5030   | [V]Presence of coronary artery bypass graft                  |
| Coronary Heart Disease | 5413   | Coronary atherosclerosis                                     |
| Coronary Heart Disease | 45370  | Allograft replacement of four or more coronary arteries      |
| Coronary Heart Disease | 34328  | Refractory angina  |
| Coronary Heart Disease | 47637  | [X]Other forms of chronic ischaemic heart disease            |
| Coronary Heart Disease | 67554  | Revision of bypass for two coronary arteries                 |
| Coronary Heart Disease | 51515  | Saphenous vein graft replacement coronary artery NOS         |
| Coronary Heart Disease | 55598  | Other replacement of coronary artery                         |
| Coronary Heart Disease | 66664  | Prosthetic replacement of two coronary arteries              |
| Coronary Heart Disease | 1678   | Inferior myocardial infarction NOS                           |
| Coronary Heart Disease | 4656   | Crescendo angina   |
| Coronary Heart Disease | 7696   | Syncope anginosa   |
| Coronary Heart Disease | 5744   | Open angioplasty of coronary artery                          |
| Coronary Heart Disease | 1792   | IHD - Ischaemic heart disease                                |
| Coronary Heart Disease | 7634   | Saphenous vein graft replacement of two coronary arteries    |
| Coronary Heart Disease | 33471  | Other bypass of coronary artery NOS                          |
| Coronary Heart Disease | 40996  | Percut translum coronary thrombolytic therapy- streptokinase |
| Coronary Heart Disease | 1344   | Coronary artery disease                                      |
| Coronary Heart Disease | 240    | Ischaemic heart disease                                      |
| Coronary Heart Disease | 26972  | ECG:posterior/inferior infarct                               |
| Coronary Heart Disease | 1677   | MI - acute myocardial infarction                             |



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| Coronary Heart Disease | 1431   | Unstable angina  |
| Coronary Heart Disease | 101121 | Coronary artery bypass graft operation planned               |
| Coronary Heart Disease | 13185  | Angina control   |
| Coronary Heart Disease | 43939  | Perc translumin balloon angioplasty stenting coronary artery |
| Coronary Heart Disease | 4017   | Old myocardial infarction                                    |
| Coronary Heart Disease | 1430   | Angina pectoris  |
| Coronary Heart Disease | 35382  | Angiocardigraphy abnormal                                    |
| Coronary Heart Disease | 45476  | H/O: Treatment for ischaemic heart disease                   |
| Coronary Heart Disease | 26975  | ECG: antero-septal infarct.                                  |
| Coronary Heart Disease | 7783   | ECG: myocardial infarction                                   |
| Coronary Heart Disease | 10260  | Coronary heart disease review                                |
| Coronary Heart Disease | 6336   | H/O: angina pectoris   |
| Coronary Heart Disease | 8942   | Insertion of coronary artery stent                           |
| Coronary Heart Disease | 23078  | Chronic myocardial ischaemia                                 |
| Coronary Heart Disease | 41835  | Postoperative subendocardial myocardial infarction           |
| Coronary Heart Disease | 46017  | Other acute myocardial infarction NOS                        |
| Coronary Heart Disease | 29902  | Angina decubitus NOS   |
| Coronary Heart Disease | 59940  | Ruptur chordae tendinae/curr comp fol acute myocard infarct  |
| Coronary Heart Disease | 28736  | Acute atrial infarction                                      |
| Coronary Heart Disease | 18889  | Asymptomatic coronary heart disease                          |
| Coronary Heart Disease | 31519  | Double implant of mammary arteries into coronary arteries    |
| Coronary Heart Disease | 46227  | ECG: Q wave abnormal   |
| Coronary Heart Disease | 41221  | Acute septal infarction                                      |
| Coronary Heart Disease | 36423  | Certain current complication follow acute myocardial infarct |
| Coronary Heart Disease | 17307  | Angina at rest   |
| Coronary Heart Disease | 11048  | Variant angina pectoris                                      |
| Coronary Heart Disease | 5703   | Percutaneous balloon coronary angioplasty                    |
| Coronary Heart Disease | 14658  | Acute myocardial infarction NOS                              |
| Coronary Heart Disease | 10562  | Acute non-ST segment elevation myocardial infarction         |
| Coronary Heart Disease | 737    | Coronary artery bypass graft operations                      |
| Coronary Heart Disease | 18125  | Nocturnal angina   |
| Coronary Heart Disease | 17133  | Mural thrombosis   |
| Coronary Heart Disease | 45960  | Antianginal therapy  |
| Coronary Heart Disease | 63467  | True posterior myocardial infarction                         |
| Coronary Heart Disease | 17872  | Acute anteroseptal infarction                                |
| Coronary Heart Disease | 62626  | Acute papillary muscle infarction                            |
| Coronary Heart Disease | 13571  | Thrombosis - coronary  |
| Coronary Heart Disease | 93828  | Other specified replacement of coronary artery               |
| Coronary Heart Disease | 7442   | Saphenous vein graft replacement of three coronary arteries  |
| Coronary Heart Disease | 46166  | Subsequent myocardial infarction of unspecified site         |
| Coronary Heart Disease | 35713  | Other specified chronic ischaemic heart disease NOS          |
| Coronary Heart Disease | 18135  | Coronary heart disease annual review                         |
| Coronary Heart Disease | 5674   | [V]Presence of coronary artery bypass graft - CABG           |
| Coronary Heart Disease | 8312   | Saphenous vein graft bypass of coronary artery               |
| Coronary Heart Disease | 1676   | Ischaemic heart disease NOS                                  |

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| Coronary Heart Disease | 14897  | Anterior myocardial infarction NOS                           |
| Coronary Heart Disease | 67761  | Prosthetic replacement of four or more coronary arteries     |
| Coronary Heart Disease | 29421  | Silent myocardial ischaemia                                  |
| Coronary Heart Disease | 93618  | Percutaneous transluminal atherectomy of coronary artery     |
| Coronary Heart Disease | 15349  | Angina control NOS   |
| Coronary Heart Disease | 20416  | Atherosclerotic heart disease                                |
| Coronary Heart Disease | 39655  | Impending infarction   |
| Coronary Heart Disease | 60664  | Cardiac enzymes abnormal - first set                         |
| Coronary Heart Disease | 45874  | Adverse reaction to fibrinolytic drugs                       |
| Coronary Heart Disease | 95550  | Admit ischaemic heart disease emergency                      |
| Coronary Heart Disease | 29643  | Acute inferoposterior infarction                             |
| Coronary Heart Disease | 101373 | Coronary angioplasty planned                                 |
| Coronary Heart Disease | 34803  | Other acute myocardial infarction                            |
| Coronary Heart Disease | 66236  | Prosthetic replacement of three coronary arteries            |
| Coronary Heart Disease | 57241  | Allograft replacement of two coronary arteries               |
| Coronary Heart Disease | 26973  | ECG:shows myocardial ischaemia                               |
| Coronary Heart Disease | 1021   | Coronary arteriograph.abnormal                               |
| Coronary Heart Disease | 27951  | Other acute and subacute ischaemic heart disease             |
| Coronary Heart Disease | 51157  | Urokinase poisoning  |
| Coronary Heart Disease | 30421  | Cardiac rupture following myocardial infarction (MI)         |
| Coronary Heart Disease | 30330  | Acute Q-wave infarct   |
| Coronary Heart Disease | 24126  | Haemopericardium/current comp folow acut myocard infarct     |
| Coronary Heart Disease | 59689  | Percutaneous transluminal arterial thrombolysis reconstruct  |
| Coronary Heart Disease | 19413  | Autograft replacement of two coronary arteries NEC           |
| Coronary Heart Disease | 87849  | Perc tran ball angio ins 3 or more drug elut stents cor art  |
| Coronary Heart Disease | 8679   | Saphenous vein graft replacement of one coronary artery      |
| Coronary Heart Disease | 60753  | Single implantation thoracic artery into coronary artery NEC |
| Coronary Heart Disease | 12229  | Acute ST segment elevation myocardial infarction             |
| Coronary Heart Disease | 11983  | Acute coronary syndrome                                      |
| Coronary Heart Disease | 57062  | H/O: Angina in last year                                     |
| Coronary Heart Disease | 17464  | Personal history of myocardial infarction                    |
| Coronary Heart Disease | 28554  | Angina pectoris NOS  |
| Coronary Heart Disease | 55137  | MI - myocardial infarction aborted                           |
| Coronary Heart Disease | 90778  | Thrombolysis of access catheter                              |
| Coronary Heart Disease | 6980   | [V]Status following coronary angioplasty NOS                 |
| Coronary Heart Disease | 2901   | Transluminal balloon angioplasty of coronary artery          |
| Coronary Heart Disease | 22892  | Thrombolytic therapy   |
| Coronary Heart Disease | 12139  | Acute anterolateral infarction                               |
| Coronary Heart Disease | 26966  | ECG: S-T elevation   |
| Coronary Heart Disease | 96361  | Continuous infusion of alteplase                             |
| Coronary Heart Disease | 46112  | Postoperative transmural myocardial infarction anterior wall |
| Coronary Heart Disease | 8246   | ECG: myocardial ischaemia                                    |
| Coronary Heart Disease | 1414   | Angina on effort   |
| Coronary Heart Disease | 14782  | Angina control - improving                                   |
| Coronary Heart Disease | 18249  | Saphenous vein graft replacement of coronary artery          |

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| Coronary Heart Disease | 38813 | Rotary blade angioplasty                                     |
| Coronary Heart Disease | 31556 | Allograft replacement of coronary artery                     |
| Coronary Heart Disease | 14898 | Lateral myocardial infarction NOS                            |
| Coronary Heart Disease | 22383 | Other specified ischaemic heart disease                      |
| Coronary Heart Disease | 52938 | Revision of bypass for one coronary artery                   |
| Coronary Heart Disease | 19655 | Angina at rest   |
| Coronary Heart Disease | 35674 | H/O: myocardial infarct <60                                  |
| Coronary Heart Disease | 68139 | Single implantation of mammary artery into coronary artery   |
| Coronary Heart Disease | 49423 | Transjugular intrahepatic thrombolysis of portal vein        |
| Coronary Heart Disease | 10209 | Autograft replacement of three coronary arteries NEC         |
| Coronary Heart Disease | 8935  | Acute inferolateral infarction                               |
| Coronary Heart Disease | 26965 | ECG: T wave abnormal   |
| Coronary Heart Disease | 68469 | [X] Adverse reaction to streptokinase                        |
| Coronary Heart Disease | 59189 | Ruptur cardiac wall w/out haemopericard/cur comp fol ac MI   |
| Coronary Heart Disease | 46230 | ECG: T wave flattened  |
| Coronary Heart Disease | 39546 | [X]Other forms of angina pectoris                            |
| Coronary Heart Disease | 32854 | Acute posterolateral myocardial infarction                   |
| Coronary Heart Disease | 29300 | Angina control - worsening                                   |
| Coronary Heart Disease | 33735 | Percut translum balloon angioplasty mult coronary arteries   |
| Coronary Heart Disease | 7347  | Unstable angina  |
| Coronary Heart Disease | 86773 | Percutaneous transluminal balloon angioplasty of artery      |
| Coronary Heart Disease | 7609  | Other autograft replacement of coronary artery NOS           |
| Coronary Heart Disease | 66388 | Status anginosus   |
| Coronary Heart Disease | 72562 | Subsequent myocardial infarction of other sites              |
| Coronary Heart Disease | 72492 | Streptokinase poisoning                                      |
| Coronary Heart Disease | 56990 | Connection of mammary artery to coronary artery NOS          |
| Coronary Heart Disease | 18643 | [V]Presence of coronary angioplasty implant and graft        |
| Coronary Heart Disease | 27977 | Other acute and subacute ischaemic heart disease NOS         |
| Coronary Heart Disease | 33650 | Percut transluminal coronary thrombolysis with streptokinase |
| Coronary Heart Disease | 70440 | Pain to thrombolysis time                                    |
| Coronary Heart Disease | 66690 | Thrombolysis contraindicated                                 |
| Coronary Heart Disease | 58135 | Radionuclide heart study abnormal                            |
| Coronary Heart Disease | 15754 | Other chronic ischaemic heart disease NOS                    |
| Coronary Heart Disease | 42304 | Insertion of drug-eluting coronary artery stent              |
| Coronary Heart Disease | 84367 | Percutaneous transluminal venous thrombolysis NEC            |
| Coronary Heart Disease | 19046 | Rotary blade coronary angioplasty                            |
| Coronary Heart Disease | 39449 | Coronary thrombosis not resulting in myocardial infarction   |
| Coronary Heart Disease | 33461 | Revision of bypass for coronary artery                       |
| Coronary Heart Disease | 34963 | Other bypass of coronary artery                              |
| Coronary Heart Disease | 28138 | Other chronic ischaemic heart disease                        |
| Coronary Heart Disease | 55401 | ECG: subendocardial infarct                                  |
| Coronary Heart Disease | 44561 | Autograft replacement of one coronary artery NEC             |
| Coronary Heart Disease | 41883 | Continuous infusion of streptokinase                         |
| Coronary Heart Disease | 48767 | Allograft replacement of coronary artery NOS                 |
| Coronary Heart Disease | 7137  | Saphenous vein graft replacement of coronary artery OS       |

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| Coronary Heart Disease | 99991  | [X]Subsequent myocardial infarction of unspecified site      |
| Coronary Heart Disease | 3999   | Single coronary vessel disease                               |
| Coronary Heart Disease | 54535  | Stenocardia  |
| Coronary Heart Disease | 9276   | Acute coronary insufficiency                                 |
| Coronary Heart Disease | 39693  | Subendocardial ischaemia                                     |
| Coronary Heart Disease | 41547  | Transluminal balloon angioplasty of coronary artery OS       |
| Coronary Heart Disease | 7134   | Other autograft bypass of coronary artery                    |
| Coronary Heart Disease | 42462  | Percut translum balloon angioplasty bypass graft coronary a  |
| Coronary Heart Disease | 45809  | Subsequent myocardial infarction of anterior wall            |
| Coronary Heart Disease | 241    | Acute myocardial infarction                                  |
| Coronary Heart Disease | 18842  | Subsequent myocardial infarction                             |
| Coronary Heart Disease | 9555   | Post infarct angina  |
| Coronary Heart Disease | 61072  | Myocardial infarction aborted                                |
| Coronary Heart Disease | 45886  | Allograft replacement of three coronary arteries             |
| Coronary Heart Disease | 9507   | Acute non-Q wave infarction                                  |
| Coronary Heart Disease | 47097  | Fibrinolysis   |
| Coronary Heart Disease | 68357  | Microinfarction of heart                                     |
| Coronary Heart Disease | 11610  | Saphenous vein graft replacement of four+ coronary arteries  |
| Coronary Heart Disease | 25842  | Angina pectoris NOS  |
| Coronary Heart Disease | 26967  | ECG: T wave inverted   |
| Coronary Heart Disease | 19402  | Prosthetic replacement of coronary artery                    |
| Coronary Heart Disease | 732    | Transluminal balloon angioplasty of coronary artery NOS      |
| Coronary Heart Disease | 62270  | ECG: Q wave pathological                                     |
| Coronary Heart Disease | 12734  | Coronary artery bypass graft occlusion                       |
| Coronary Heart Disease | 3704   | Acute subendocardial infarction                              |
| Coronary Heart Disease | 69474  | Rupture papillary muscle/curr comp fol acute myocard infarct |
| Coronary Heart Disease | 50372  | H/O: Myocardial infarction in last year                      |
| Coronary Heart Disease | 62238  | Adverse reaction to streptokinase                            |
| Coronary Heart Disease | 68748  | Postoperative myocardial infarction, unspecified             |
| Coronary Heart Disease | 36854  | Coronary artery spasm  |
| Coronary Heart Disease | 20903  | Peroperative angioplasty                                     |
| Coronary Heart Disease | 40429  | Acute anteroapical infarction                                |
| Coronary Heart Disease | 29758  | Acute transmural myocardial infarction of unspecif site      |
| Coronary Heart Disease | 100139 | History of myocardial infarction                             |
| Coronary Heart Disease | 20095  | Angina decubitus   |
| Coronary Heart Disease | 92419  | Prosthetic replacement of one coronary artery                |
| Coronary Heart Disease | 19193  | Prosthetic replacement of coronary artery NOS                |
| Coronary Heart Disease | 37657  | Ventric septal defect/curr comp fol acut myocardal infarctn  |
| Coronary Heart Disease | 17689  | Silent myocardial infarction                                 |
| Coronary Heart Disease | 32450  | Ischaemic chest pain   |
| Coronary Heart Disease | 8568   | Cardiac syndrome X   |
| Coronary Heart Disease | 62608  | Double anastom thoracic arteries to coronary arteries NEC    |
| Coronary Heart Disease | 61670  | Diab mellit insulin-glucose infus acute myocardial infarct   |
| Coronary Heart Disease | 18118  | Worsening angina   |
| Coronary Heart Disease | 86071  | Percut translum cutting balloon angioplasty coronary artery  |

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| Coronary Heart Disease | 23579 | Postmyocardial infarction syndrome  |
| Coronary Heart Disease | 15661 | Dressler's syndrome   |
| Coronary Heart Disease | 36523 | Preinfarction syndrome  |
| Coronary Heart Disease | 16408 | Healed myocardial infarction  |
| Coronary Heart Disease | 59032 | ECG: myocardial infarct NOS   |
| Coronary Heart Disease | 94504 | Door to needle time   |
| Coronary Heart Disease | 18030 | Percut translum thrombolysis femoral graft streptokinase  |
| Coronary Heart Disease | 34633 | Other specified chronic ischaemic heart disease<br>Thrombosis atrium,auric append&vent/curr comp foll acute |
| Coronary Heart Disease | 29553 | MI  |
| Coronary Heart Disease | 42104 | ECG: S-T depression   |
| Coronary Heart Disease | 9414  | Other autograft replacement of coronary artery  |
| Coronary Heart Disease | 37682 | Connection of mammary artery to coronary artery   |
| Coronary Heart Disease | 54251 | Preinfarction syndrome NOS  |
| Coronary Heart Disease | 70185 | Percutaneous transluminal atherectomy   |
| Coronary Heart Disease | 15373 | Angina control - poor   |
| Coronary Heart Disease | 32651 | Allograft bypass of coronary artery   |
| Coronary Heart Disease | 85947 | Perc translum balloon angioplasty insert 1-2 stents cor art   |
| Coronary Heart Disease | 46276 | Postoperative transmural myocardial infarction inferior wall  |
| Coronary Heart Disease | 61208 | Perc translum balloon angioplasty stenting coronary art NOS   |
| Coronary Heart Disease | 23892 | Posterior myocardial infarction NOS   |
| Coronary Heart Disease | 68123 | RIMA single anastomosis   |
| Coronary Heart Disease | 52705 | ECG: lateral infarction   |
| Coronary Heart Disease | 44348 | Percutaneous transluminal thrombolysis of artery<br>Single anastomosis of mammary artery to coronary artery |
| Coronary Heart Disease | 51507 | NEC   |
| Coronary Heart Disease | 18913 | [V]Presence of aortocoronary bypass graft   |
| Coronary Heart Disease | 22647 | LIMA single anastomosis   |
| Coronary Heart Disease | 67591 | Single anastomosis of thoracic artery to coronary artery NEC  |
| Coronary Heart Disease | 39904 | ECG: old myocardial infarction  |
| Coronary Heart Disease | 96838 | [X]Acute transmural myocardial infarction of unspecif site  |
| Coronary Heart Disease | 24540 | Chronic coronary insufficiency  |
| Coronary Heart Disease | 19542 | Angina control - good   |
| Coronary Heart Disease | 12986 | Prinzmetal's angina   |
| Coronary Heart Disease | 72780 | Connection of other thoracic artery to coronary artery NOS  |
| Coronary Heart Disease | 26863 | New onset angina  |
| Coronary Heart Disease | 28837 | Creation of bypass from mammary artery to coronary artery   |
| Coronary Heart Disease | 11648 | Coronary heart disease medication review  |
| Coronary Heart Disease | 733   | Percutaneous transluminal angioplasty of artery NEC   |
| Coronary Heart Disease | 35287 | ECG: myocardial ischaemia NOS   |
| Coronary Heart Disease | 54922 | Thrombolytic therapy refused  |
| Coronary Heart Disease | 97001 | Cardiac troponin positive   |
| Coronary Heart Disease | 61310 | Other autograft replacement of coronary artery OS   |
| Coronary Heart Disease | 13566 | Attack - heart  |
| Coronary Heart Disease | 5387  | Other specified anterior myocardial infarction  |
| Coronary Heart Disease | 70755 | Replacement of coronary artery NOS  |

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| Coronary Heart Disease | 101692 | Long term dual antiplatelet drug therapy indicated           |
| Coronary Heart Disease | 21844  | Transient myocardial ischaemia                               |
| Coronary Heart Disease | 96804  | Connection of other thoracic artery to coronary artery       |
| Coronary Heart Disease | 40399  | H/O: myocardial infarct >60                                  |
| Coronary Heart Disease | 68401  | [X]Other forms of acute ischaemic heart disease              |
| Coronary Heart Disease | 70111  | Allograft replacement of one coronary artery                 |
| Coronary Heart Disease | 69776  | Mechanical complication of coronary bypass                   |
| Coronary Heart Disease | 32272  | Postoperative myocardial infarction                          |
| Coronary Heart Disease | 37719  | Connection of mammary artery to coronary artery OS           |
| Coronary Heart Disease | 38609  | Subsequent myocardial infarction of inferior wall            |
| Coronary Heart Disease | 33718  | Double anastomosis of mammary arteries to coronary arteries  |
| Coronary Heart Disease | 1204   | Heart attack   |
| Coronary Heart Disease | 2491   | Coronary thrombosis  |
| Coronary Heart Disease | 57634  | Revision of bypass for coronary artery NOS                   |
| Coronary Heart Disease | 22020  | Endarterectomy of coronary artery NEC                        |
| Coronary Heart Disease | 96537  | OS perc translumina balloon angioplast stenting coronary art |
| Coronary Heart Disease | 24783  | Arteriosclerotic heart disease                               |
| Coronary Heart Disease | 60067  | Perc translum ball angio insert 1-2 drug elut stents cor art |
| Coronary Heart Disease | 66921  | Percutaneous transluminal angioplasty of vascular graft      |
| Coronary Heart Disease | 42708  | Autograft replacement of four of more coronary arteries NEC  |
| Coronary Heart Disease | 22828  | Percutaneous transluminal laser coronary angioplasty         |
| Coronary Heart Disease | 64923  | Prosthetic graft patch angioplasty                           |
| Coronary Heart Disease | 92927  | Percutaneous cor balloon angiop 3 more stents cor art NEC    |
| Coronary Heart Disease | 31540  | Revision of bypass for three coronary arteries               |
| Coronary Heart Disease | 55092  | Replacement of coronary arteries using multiple methods      |
| Coronary Heart Disease | 36011  | Prosthetic bypass of coronary artery                         |
| Coronary Heart Disease | 12804  | Stable angina  |
| Coronary Heart Disease | 59423  | Other specified allograft replacement of coronary artery     |
| Coronary Heart Disease | 18670  | Percut transluminal balloon angioplasty one coronary artery  |
| Coronary Heart Disease | 1655   | Triple vessel disease of the heart                           |
| Coronary Heart Disease | 5221   | Cardiac enzymes abnormal                                     |
| Coronary Heart Disease | 52517  | [X]Ischaemic heart diseases                                  |
| Coronary Heart Disease | 9413   | Other acute and subacute ischaemic heart disease             |
| Coronary Heart Disease | 97953  | Other specified revision of bypass for coronary artery       |
| Dementia               | 27677  | Presenile dementia with depression                           |
| Dementia               | 1917   | Alzheimer's disease  |
| Dementia               | 31016  | [X]Mixed cortical and subcortical vascular dementia          |
| Dementia               | 60059  | [X]Primary degen dementia, Alzheimer's type, presenile onset |
| Dementia               | 27342  | Alcoholic dementia NOS                                       |
| Dementia               | 46488  | [X]Vascular dementia of acute onset                          |
| Dementia               | 1916   | Senile dementia  |
| Dementia               | 15165  | Presenile dementia   |
| Dementia               | 11136  | Pick's disease   |
| Dementia               | 48501  | [X] Presenile dementia NOS                                   |
| Dementia               | 1350   | Senile/presenile dementia                                    |

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| Dementia | 16797 | Alzheimer's disease with early onset                     |
| Dementia | 27759 | [X] Senile dementia, depressed or paranoid type          |
| Dementia | 11175 | [X]Multi-infarct dementia                                |
| Dementia | 34944 | [X] Primary degenerative dementia NOS                    |
| Dementia | 41185 | [X]Dementia in human immunodef virus [HIV] disease       |
| Dementia | 37015 | Senile dementia with delirium                            |
| Dementia | 25704 | [X]Presenile dementia,Alzheimer's type                   |
| Dementia | 7323  | Uncomplicated senile dementia                            |
| Dementia | 26270 | [X]Lewy body dementia                                    |
| Dementia | 7664  | [X]Dementia in Alzheimer's disease                       |
| Dementia | 43089 | Uncomplicated arteriosclerotic dementia                  |
| Dementia | 55467 | Arteriosclerotic dementia with paranoia                  |
| Dementia | 8195  | [X]Alzheimer's dementia unspec                           |
| Dementia | 38678 | [X]Dementia in Alzheimer's disease with late onset       |
| Dementia | 21887 | Senile dementia with depression                          |
| Dementia | 54106 | [X]Dementia in Creutzfeldt-Jakob disease                 |
| Dementia | 42602 | Uncomplicated presenile dementia                         |
| Dementia | 55838 | [X]Predominantly cortical dementia                       |
| Dementia | 9565  | [X]Arteriosclerotic dementia                             |
| Dementia | 6578  | [X]Vascular dementia                                     |
| Dementia | 53446 | [X]Delirium superimposed on dementia                     |
| Dementia | 41089 | Senile dementia with depressive or paranoid features NOS |
| Dementia | 9509  | [X]Dementia in Parkinson's disease                       |
| Dementia | 38438 | Presenile dementia NOS                                   |
| Dementia | 26323 | [X]Alcoholic dementia NOS                                |
| Dementia | 8934  | [X]Subcortical vascular dementia                         |
| Dementia | 25386 | Dementia in conditions EC                                |
| Dementia | 4693  | [X] Unspecified dementia                                 |
| Dementia | 28402 | [X]Dementia in Pick's disease                            |
| Dementia | 30032 | Presenile dementia with paranoia                         |
| Dementia | 11379 | [X]Senile dementia,Alzheimer's type                      |
| Dementia | 37014 | [X]Dementia in Huntington's disease                      |
| Dementia | 44674 | Senile dementia with depressive or paranoid features     |
| Dementia | 49263 | [X]Dementia in Alzheimer's disease with early onset      |
| Dementia | 56912 | Arteriosclerotic dementia with delirium                  |
| Dementia | 46762 | [X]Alzheimer's disease type 1                            |
| Dementia | 43292 | Arteriosclerotic dementia with depression                |
| Dementia | 55313 | [X]Other vascular dementia                               |
| Dementia | 62132 | Drug-induced dementia                                    |
| Dementia | 18386 | Senile dementia with paranoia                            |
| Dementia | 49513 | Presenile dementia with delirium                         |
| Dementia | 7572  | Lewy body disease  |
| Dementia | 19393 | [X]Vascular dementia, unspecified                        |
| Dementia | 54505 | Other alcoholic dementia                                 |
| Dementia | 32057 | Alzheimer's disease with late onset                      |

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| Dementia | 29386  | [X]Dementia in Alzheimer's disease, unspecified  |
| Dementia | 42279  | Arteriosclerotic dementia NOS  |
| Dementia | 30706  | [X]Dementia in Alzheimer's dis, atypical or mixed type   |
| Dementia | 59122  | [X]Other Alzheimer's disease   |
| Dementia | 8634   | Multi infarct dementia   |
| Dementia | 4357   | [X] Senile dementia NOS  |
| Dementia | 5931   | H/O: dementia  |
| Dementia | 12621  | [X]Dementia in other diseases classified elsewhere   |
| Dementia | 43346  | [X]Primary degen dementia of Alzheimer's type, senile onset  |
| Dementia | 61528  | [X]Alzheimer's disease type 2  |
| Dementia | 19477  | Arteriosclerotic dementia  |
| Dementia | 64267  | [X]Dementia in other specified diseases classif elsewhere  |
| Diabetes | 9310   | [X]Hyperglycaemia, unspecified   |
| Diabetes | 55239  | Type 1 diabetes mellitus with gastroparesis  |
| Diabetes | 63357  | Diabetes mellitus, adult, + peripheral circulatory disorder  |
| Diabetes | 106528 | Type II diabetes mellitus with ketoacidosis  |
| Diabetes | 91646  | Type II diabetes mellitus with ulcer   |
| Diabetes | 6430   | Attending diabetes clinic  |
| Diabetes | 50960  | Pre-existing diabetes mellitus, insulin-dependent  |
| Diabetes | 59365  | Non-insulin dependent diabetes mellitus with nephropathy   |
| Diabetes | 38161  | Type I diabetes mellitus with retinopathy  |
| Diabetes | 97281  | Seen by general practitioner special interest in diabetes  |
| Diabetes | 32627  | Type 2 diabetes mellitus with ketoacidosis   |
| Diabetes | 46624  | Maturity onset diabetes in youth   |
| Diabetes | 2986   | Preproliferative diabetic retinopathy  |
| Diabetes | 57278  | Type II diabetes mellitus with renal complications<br>Referral to DESMOND diabetes structured education<br>programme |
| Diabetes | 93657  | Diabetes type 1 review   |
| Diabetes | 85660  | Diabetes type 1 review   |
| Diabetes | 62384  | O/E - right chronic diabetic foot ulcer  |
| Diabetes | 65025  | Diabetes mellitus NOS with peripheral circulatory disorder   |
| Diabetes | 26664  | O/E - Left diabetic foot at risk   |
| Diabetes | 17478  | Self monitoring of blood glucose   |
| Diabetes | 24363  | Diabetic stabilisation   |
| Diabetes | 8403   | Non-insulin dependent diabetes mellitus - poor control   |
| Diabetes | 33254  | Diabetes mellitus with ophthalmic manifestation  |
| Diabetes | 106723 | Diabetic foot screening invitation first letter  |
| Diabetes | 40837  | Type 1 diabetes mellitus with ketoacidotic coma  |
| Diabetes | 100480 | Subcutaneous injection of exenatide  |
| Diabetes | 105741 | O/E - Right diabetic foot at increased risk  |
| Diabetes | 61071  | Type 2 diabetes mellitus with hypoglycaemic coma   |
| Diabetes | 18777  | Type 2 diabetes mellitus with renal complications  |
| Diabetes | 17859  | Type 2 diabetes mellitus   |
| Diabetes | 106360 | Erectile dysfunction due to diabetes mellitus  |
| Diabetes | 46301  | Type 1 diabetes mellitus with polyneuropathy   |



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| Diabetes | 11018  | Diabetic retinopathy 12 month review  |
| Diabetes | 26667  | O/E - Left diabetic foot at low risk  |
| Diabetes | 70821  | Diabetes mellitus NOS with other specified manifestation  |
| Diabetes | 31172  | O/E - Left diabetic foot at high risk   |
| Diabetes | 11930  | Under care of diabetes specialist nurse<br>Did not complete XPERT diabetes structured education |
| Diabetes | 94956  | program   |
| Diabetes | 105585 | Diabetes clinical pathway   |
| Diabetes | 17236  | H/O: insulin therapy  |
| Diabetes | 11050  | Blood hyperglycaemia NOS  |
| Diabetes | 46150  | Type 2 diabetes mellitus with gangrene  |
| Diabetes | 16490  | Diabetic treatment changed  |
| Diabetes | 16881  | [V]Dietary counselling in diabetes mellitus   |
| Diabetes | 107701 | Hyperosmolar non-ketotic state in type II diabetes mellitus                                     |
| Diabetes | 26666  | O/E - Right diabetic foot at low risk   |
| Diabetes | 95539  | Maternally inherited diabetes mellitus  |
| Diabetes | 17869  | Diabetic-uncooperative patient  |
| Diabetes | 28574  | Exception reporting: diabetes quality indicators  |
| Diabetes | 32739  | Seen in community diabetes specialist clinic  |
| Diabetes | 104323 | Type II diabetes mellitus with gangrene   |
| Diabetes | 13597  | Hb. A1C < 7% - good control   |
| Diabetes | 17095  | O/E - Right diabetic foot at risk   |
| Diabetes | 34268  | Type 2 diabetes mellitus with neurological complications  |
| Diabetes | 95094  | Did not complete diabetes structured education programme  |
| Diabetes | 1549   | Type 1 diabetes mellitus  |
| Diabetes | 11348  | Excepted from diabetes quality indicators: Informed dissent                                     |
| Diabetes | 49146  | Type I diabetes mellitus with neurological complications  |
| Diabetes | 11551  | Diabetes mellitus induced by steroids   |
| Diabetes | 27921  | Foot abnormality - diabetes related   |
| Diabetes | 36798  | Continuous subcutaneous infusion of insulin   |
| Diabetes | 1323   | Diabetic retinopathy  |
| Diabetes | 13192  | Diabetes monitor. check done  |
| Diabetes | 7059   | Admit diabetic emergency  |
| Diabetes | 21689  | Diabetic lipid lowering diet  |
| Diabetes | 22871  | Type 1 diabetes mellitus with exudative maculopathy   |
| Diabetes | 31790  | Polyneuropathy in diabetes  |
| Diabetes | 34450  | Hyperosmolar non-ketotic state in type 2 diabetes mellitus                                      |
| Diabetes | 24423  | Type I diabetes mellitus  |
| Diabetes | 13069  | Has seen dietician - diabetes   |
| Diabetes | 52212  | [X]Diabetes mellitus  |
| Diabetes | 93390  | Attended DAFNE diabetes structured education programme  |
| Diabetes | 4513   | Non-insulin dependent diabetes mellitus   |
| Diabetes | 13291  | Feet examination  |
| Diabetes | 69163  | Referral to multidisciplinary diabetic clinic   |
| Diabetes | 13070  | Initial diabetic assessment   |

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| Diabetes | 93380  | Cystic fibrosis related diabetes mellitus   |
| Diabetes | 31171  | O/E - Right diabetic foot at high risk  |
| Diabetes | 93875  | Insulin dependent diabetes mellitus with retinopathy  |
| Diabetes | 34528  | Diabetes well being questionnaire   |
| Diabetes | 13678  | Referral to diabetic liaison nurse  |
| Diabetes | 18425  | Type 2 diabetes mellitus with polyneuropathy  |
| Diabetes | 70766  | Type 1 diabetes mellitus with hypoglycaemic coma  |
| Diabetes | 6813   | H/O: diabetes mellitus  |
| Diabetes | 31141  | Diabetes monitor.phone invite   |
| Diabetes | 7563   | Diabetic on diet only   |
| Diabetes | 95813  | Seen in multidisciplinary diabetic clinic   |
| Diabetes | 91164  | CSQ - Diabetes clinic satisfaction questionnaire  |
| Diabetes | 7795   | Diabetes mellitus with neuropathy   |
| Diabetes | 61829  | Type 1 diabetes mellitus with neurological complications  |
| Diabetes | 13193  | Blood sugar charts  |
| Diabetes | 36633  | Hyperosmolar non-ketotic state in type 2 diabetes mellitus  |
| Diabetes | 12507  | Seen by diabetic liaison nurse  |
| Diabetes | 34152  | Diabetic peripheral angiopathy  |
| Diabetes | 102620 | Type I diabetes mellitus with persistent microalbuminuria   |
| Diabetes | 60208  | Type I diabetes mellitus with neuropathic arthropathy   |
| Diabetes | 60796  | Type II diabetes mellitus with persistent proteinuria   |
| Diabetes | 12247  | Diabetic foot examination not indicated   |
| Diabetes | 105740 | O/E - Left diabetic foot at increased risk  |
| Diabetes | 47650  | Type 1 diabetes mellitus with multiple complications  |
| Diabetes | 107739 | Advice about diabetes and driving   |
| Diabetes | 18311  | Diabetic retinopathy screening  |
| Diabetes | 68792  | Diabetes mellitus, juvenile type, + unspecified complication  |
| Diabetes | 103743 | Diabetes care plan declined   |
| Diabetes | 61344  | Type I diabetes mellitus with renal complications   |
| Diabetes | 11677  | Refer to diabetic foot screener   |
| Diabetes | 44779  | Type 2 diabetes mellitus with diabetic cataract   |
| Diabetes | 60699  | Type 2 diabetes mellitus with peripheral angiopathy   |
| Diabetes | 61461  | Informed consent for diabetes national audit  |
| Diabetes | 11129  | O/E - left eye background diabetic retinopathy  |
| Diabetes | 93727  | Type II diabetes mellitus with diabetic cataract  |
| Diabetes | 17545  | Type I diabetes mellitus with diabetic cataract   |
| Diabetes | 30323  | Type 1 diabetes mellitus with persistent proteinuria<br>Did not attend DAFNE diabetes structured education<br>programme |
| Diabetes | 99277  |   |
| Diabetes | 65684  | [X] Adverse reaction to insulins and antidiabetic agents  |
| Diabetes | 37315  | Diabetic mononeuropathy   |
| Diabetes | 28769  | Diabetic on insulin and oral treatment  |
| Diabetes | 12030  | Diabetes monitoring 3rd letter  |
| Diabetes | 22507  | Metformin not tolerated   |
| Diabetes | 10099  | Advanced diabetic maculopathy   |

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| Diabetes | 47341  | Diabetic crisis monitoring                                   |
| Diabetes | 58133  | Discharge by diabetic liaison nurse                          |
| Diabetes | 22823  | Diabetic foot examination                                    |
| Diabetes | 68818  | DTSQ - Diabetes treatment satisfaction questionnaire         |
| Diabetes | 101801 | Type II diabetic dietary review                              |
| Diabetes | 25591  | Type 2 diabetes mellitus with exudative maculopathy          |
| Diabetes | 62352  | Type I diabetes mellitus with arthropathy                    |
| Diabetes | 18278  | Insulin treated Type 2 diabetes mellitus                     |
| Diabetes | 13104  | O/E - no left diabetic retinopathy                           |
| Diabetes | 44312  | Informed dissent for diabetes national audit                 |
| Diabetes | 10659  | Diabetic cataract  |
| Diabetes | 99716  | Insulin dependent diabetes mellitus with hypoglycaemic coma  |
| Diabetes | 102112 | Type I diabetes mellitus with gangrene                       |
| Diabetes | 102704 | Type I diabetic dietary review                               |
| Diabetes | 19739  | Diabetic retinopathy screening offered                       |
| Diabetes | 45491  | Diabetes mellitus with unspecified complication              |
| Diabetes | 72345  | Diabetes mellitus NOS with hyperosmolar coma                 |
| Diabetes | 7045   | H/O: Admission in last year for diabetes foot problem        |
| Diabetes | 41049  | Type 1 diabetes mellitus with retinopathy                    |
| Diabetes | 41389  | Diabetes mellitus, adult onset, + ophthalmic manifestation   |
| Diabetes | 94383  | Secondary diabetes mellitus without complication             |
| Diabetes | 50972  | Diabetes mellitus NOS with no mention of complication        |
| Diabetes | 36669  | Diabetic monitoring not required                             |
| Diabetes | 100033 | [X] Adverse reaction to insulins and antidiabetic agents NOS |
| Diabetes | 8414   | Pt advised re diabetic diet                                  |
| Diabetes | 5002   | Diabetic polyneuropathy                                      |
| Diabetes | 95553  | Did not attend diabetes structured education programme       |
| Diabetes | 47954  | Type 2 diabetes mellitus without complication                |
| Diabetes | 40962  | Non-insulin dependent d m with neuropathic arthropathy       |
| Diabetes | 64668  | Insulin treated Type II diabetes mellitus                    |
| Diabetes | 104453 | Type 1 diabetic dietary review                               |
| Diabetes | 12736  | Type 2 diabetes mellitus with gangrene                       |
| Diabetes | 44260  | Insulin dependent diabetes mellitus with diabetic cataract   |
| Diabetes | 26054  | Type 2 diabetes mellitus with persistent proteinuria         |
| Diabetes | 101190 | Declined consent for diabetes year of care programme         |
| Diabetes | 102740 | Type 1 diabetes mellitus with ophthalmic complications       |
| Diabetes | 45919  | Type 2 diabetes mellitus with neurological complications     |
| Diabetes | 13279  | Other specified diabetes mellitus with renal complications   |
| Diabetes | 96116  | Sulphonylureas contraindicated                               |
| Diabetes | 13108  | O/E - left eye diabetic maculopathy                          |
| Diabetes | 61021  | Diabetic digital retinopathy screening offered               |
| Diabetes | 9881   | Mixed diabetic ulcer - foot                                  |
| Diabetes | 13097  | O/E - right eye proliferative diabetic retinopathy           |
| Diabetes | 13078  | Diabetic weight reducing diet                                |
| Diabetes | 13074  | Diabetic diet  |

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| Diabetes | 83532  | Diabetes type 2 review                                       |
| Diabetes | 26605  | Attended diabetes structured education programme             |
| Diabetes | 18167  | Annual diabetic blood test                                   |
| Diabetes | 1684   | Diabetic on oral treatment                                   |
| Diabetes | 11041  | Excepted from diabetes qual indicators: Patient unsuitable   |
| Diabetes | 13833  | Glucometer blood sugar                                       |
| Diabetes | 101735 | Insulin-dependent diabetes mellitus with neurological comps  |
| Diabetes | 62146  | Non-insulin-dependent diabetes mellitus with multiple comps  |
| Diabetes | 18683  | Type 1 diabetes mellitus with ulcer                          |
| Diabetes | 97894  | Type I diabetes mellitus with exudative maculopathy          |
| Diabetes | 44443  | Insulin dependent diabetes mellitus with ulcer               |
| Diabetes | 38130  | Diabetes wellbeing questionnaire                             |
| Diabetes | 21482  | Diabetes mellitus with hyperosmolar coma                     |
| Diabetes | 35383  | Diabetic patient unsuitable for digital retinal photography  |
| Diabetes | 39809  | Insulin dependent diab mell with neuropathic arthropathy     |
| Diabetes | 12675  | Diabetes: shared care programme                              |
| Diabetes | 61210  | Adverse reaction to insulins and antidiabetic agents NOS     |
| Diabetes | 12262  | Diabetic retinopathy screening refused                       |
| Diabetes | 63412  | Diabetes clinical management plan                            |
| Diabetes | 43785  | Non-insulin dependent diabetes mellitus with hypoglyca coma  |
| Diabetes | 22967  | Retinal abnormality - diabetes related                       |
| Diabetes | 33343  | Diabetes mellitus with other specified manifestation         |
| Diabetes | 28856  | Transition of diabetes care options discussed                |
| Diabetes | 32403  | Diabetes mellitus with gangrene                              |
| Diabetes | 47582  | Type 1 diabetes mellitus with renal complications            |
| Diabetes | 27891  | Diabetic Charcot arthropathy                                 |
| Diabetes | 103816 | Insulin alert patient information booklet given              |
| Diabetes | 72333  | Listed for Diabetology admissn                               |
| Diabetes | 24490  | Diabetes mellitus, juvenile type, no mention of complication |
| Diabetes | 9013   | Unstable diabetes  |
| Diabetes | 61470  | Diabetic monitoring - higher risk albumin excretion          |
| Diabetes | 65463  | High risk non proliferative diabetic retinopathy             |
| Diabetes | 46850  | Type I diabetes mellitus - poor control                      |
| Diabetes | 20900  | Diabetes monitored   |
| Diabetes | 2478   | Brittle diabetes   |
| Diabetes | 100032 | [X] Adverse reaction to tolbutamide                          |
| Diabetes | 13604  | Hb. A1C > 10% - bad control                                  |
| Diabetes | 10642  | Dietary advice for diabetes mellitus                         |
| Diabetes | 54899  | Type II diabetes mellitus with peripheral angiopathy         |
| Diabetes | 17858  | Type 1 diabetes mellitus                                     |
| Diabetes | 13057  | Health education - diabetes                                  |
| Diabetes | 46290  | Other specified diabetes mellitus with multiple comps        |
| Diabetes | 48310  | [V]Admitted for commencement of insulin                      |
| Diabetes | 59903  | Diabetic amyotrophy  |
| Diabetes | 26603  | Refuses diabetes monitoring                                  |

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| Diabetes | 39070  | Type 1 diabetes mellitus with hypoglycaemic coma            |
| Diabetes | 31053  | [D]Widespread diabetic foot gangrene                        |
| Diabetes | 106332 | Eligible for diabetic retinopathy screening                 |
| Diabetes | 93491  | DAFNE diabetes structured education programme completed     |
| Diabetes | 18264  | Insulin treated Type II diabetes mellitus                   |
| Diabetes | 18056  | Foot abnormality - diabetes related                         |
| Diabetes | 13195  | Diabetes monitoring 2nd letter                              |
| Diabetes | 18824  | Diabetic foot examination declined                          |
| Diabetes | 48078  | Acute painful diabetic neuropathy                           |
| Diabetes | 16946  | Diabetic child  |
| Diabetes | 22573  | Diabetes mellitus NOS with neurological manifestation       |
| Diabetes | 18642  | Type 1 diabetes mellitus with arthropathy                   |
| Diabetes | 107331 | Conversion to insulin in secondary care                     |
| Diabetes | 2378   | Diabetic - poor control                                     |
| Diabetes | 7069   | Background diabetic retinopathy                             |
| Diabetes | 99628  | [X]Glomerular disorders in diabetes mellitus                |
| Diabetes | 6125   | Diabetic annual review                                      |
| Diabetes | 24571  | Asymptomatic diabetic neuropathy                            |
| Diabetes | 108005 | Type 2 diabetes mellitus with multiple complications        |
| Diabetes | 101881 | Impaired vision due to diabetic retinopathy                 |
| Diabetes | 101455 | Diabetes monitor invitation by SMS (short message service)  |
| Diabetes | 35385  | Type 2 diabetes mellitus with neuropathic arthropathy       |
| Diabetes | 98723  | Type II diabetes mellitus with hypoglycaemic coma           |
| Diabetes | 14889  | Maturity onset diabetes                                     |
| Diabetes | 35288  | Type 1 diabetes mellitus - poor control                     |
| Diabetes | 35116  | O/E - Left diabetic foot - ulcerated                        |
| Diabetes | 35105  | Diabetes mellitus, adult onset, with renal manifestation    |
| Diabetes | 2340   | Diabetic amyotrophy   |
| Diabetes | 13067  | Diabetic monitoring NOS                                     |
| Diabetes | 18219  | Type II diabetes mellitus                                   |
| Diabetes | 47032  | Diabetes care plan agreed                                   |
| Diabetes | 18230  | Type 1 diabetes mellitus with neuropathic arthropathy       |
| Diabetes | 50937  | Referral to diabetes preconception counselling clinic       |
| Diabetes | 10418  | Type 1 diabetes mellitus with nephropathy                   |
| Diabetes | 67853  | Diabetes mellitus, juvenile, + neurological manifestation   |
| Diabetes | 33807  | Diabetes mellitus, adult with gangrene                      |
| Diabetes | 42567  | Diabetes mellitus, juvenile type, with ketoacidotic coma    |
| Diabetes | 61557  | Diabetology D.V. requested                                  |
| Diabetes | 83485  | Insulin dose changed  |
| Diabetes | 62209  | Type I diabetes mellitus with ketoacidosis                  |
| Diabetes | 18662  | Diabetic retinopathy 6 month review                         |
| Diabetes | 41686  | [X]Other specified diabetes mellitus                        |
| Diabetes | 32770  | Glucose tol. test diabetic                                  |
| Diabetes | 56803  | NIDDM with peripheral circulatory disorder                  |
| Diabetes | 106679 | Provision of written information about diabetes and driving |

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| Diabetes | 16230  | Diabetes mellitus with neurological manifestation           |
| Diabetes | 69152  | Insulin needles changed less than once a day                |
| Diabetes | 71486  | Adverse reaction to chlorpropamide                          |
| Diabetes | 44033  | Diabetic mononeuritis multiplex                             |
| Diabetes | 98704  | Insulin dependent diabetes mellitus with ulcer              |
| Diabetes | 47144  | O/E - diabetic maculopathy absent both eyes                 |
| Diabetes | 13036  | Adverse reaction to glucagon                                |
| Diabetes | 104639 | Type II diabetes mellitus with peripheral angiopathy        |
| Diabetes | 13099  | O/E - right eye preproliferative diabetic retinopathy       |
| Diabetes | 45467  | Non-insulin dependent diabetes mellitus with polyneuropathy |
| Diabetes | 22130  | Diabetes monitoring default                                 |
| Diabetes | 104858 | Insulin passport checked                                    |
| Diabetes | 17817  | Subcutaneous injection of insulin                           |
| Diabetes | 100533 | Unsuitable for diabetes year of care programme              |
| Diabetes | 61523  | Other specified diabetes mellitus with neurological comps   |
| Diabetes | 57621  | Insulin dependent diabetes mellitus with nephropathy        |
| Diabetes | 34541  | Private referral to diabetologist                           |
| Diabetes | 26485  | [X] Adverse reaction to metformin hydrochloride             |
| Diabetes | 42360  | HbA1 < 7% - good control                                    |
| Diabetes | 85991  | Type II diabetes mellitus with persistent microalbuminuria  |
| Diabetes | 11599  | Pan retinal photocoagulation for diabetes                   |
| Diabetes | 98954  | Diabetes treatment satisfaction questionnaire               |
| Diabetes | 16502  | Diabetes mellitus with renal manifestation                  |
| Diabetes | 6791   | Insulin dependent diabetes mellitus - poor control          |
| Diabetes | 11094  | Under care of diabetic foot screener                        |
| Diabetes | 93922  | Diabetes mellitus, juvenile type, with renal manifestation  |
| Diabetes | 93854  | Diabetes structured education programme declined            |
| Diabetes | 8618   | Seen by diabetic liaison nurse                              |
| Diabetes | 49949  | Unstable type I diabetes mellitus                           |
| Diabetes | 2342   | Diabetic neuropathy   |
| Diabetes | 69043  | Dietary advice for type I diabetes                          |
| Diabetes | 45914  | Type 1 diabetes mellitus - poor control                     |
| Diabetes | 96506  | Secondary pancreatic diabetes mellitus without complication |
| Diabetes | 51939  | [V]Admitted for conversion to insulin                       |
| Diabetes | 40401  | Non-insulin dependent diabetes mellitus with gangrene       |
| Diabetes | 40682  | Type 1 diabetes mellitus maturity onset                     |
| Diabetes | 66965  | Type 2 diabetes mellitus with neuropathic arthropathy       |
| Diabetes | 58604  | Type II diabetes mellitus with retinopathy                  |
| Diabetes | 67664  | Education score - diabetes                                  |
| Diabetes | 54008  | Type 1 diabetes mellitus with neuropathic arthropathy       |
| Diabetes | 69124  | IDDM with peripheral circulatory disorder                   |
| Diabetes | 95992  | Type I diabetes mellitus without complication               |
| Diabetes | 25636  | Diabetic diet - poor compliance                             |
| Diabetes | 47058  | Discharged from care of diabetes specialist nurse           |
| Diabetes | 1647   | Insulin dependent diabetes mellitus                         |

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| Diabetes | 38129  | Seen in community diabetic specialist nurse clinic                                   |
| Diabetes | 14050  | HbA1 - diabetic control  |
| Diabetes | 18747  | Diabetic retinopathy screening not indicated   |
| Diabetes | 45499  | Kimmelstiel - Wilson disease   |
| Diabetes | 2379   | Seen in diabetic clinic  |
| Diabetes | 47584  | Advanced diabetic retinal disease  |
| Diabetes | 12703  | Education score - diabetes   |
| Diabetes | 54212  | Non-insulin-dependent d m with peripheral angiopath                                  |
| Diabetes | 95636  | Latent autoimmune diabetes mellitus in adult   |
| Diabetes | 49640  | O/E - left chronic diabetic foot ulcer   |
| Diabetes | 105784 | Type 2 diabetes mellitus without complication  |
| Diabetes | 10824  | Seen in diabetic foot clinic   |
| Diabetes | 9835   | O/E - diabetic maculopathy present both eyes   |
| Diabetes | 18505  | IDDM-Insulin dependent diabetes mellitus   |
| Diabetes | 72702  | Insulin dependent diabetes mellitus - poor control                                   |
| Diabetes | 111483 | Diabetic on insulin and glucagon-like peptide 1                                      |
| Diabetes | 104254 | Subcutaneous infusion with insulin pump  |
| Diabetes | 3286   | Proliferative diabetic retinopathy   |
| Diabetes | 64142  | Referral for diabetic retinopathy screening  |
| Diabetes | 2471   | Nephrotic syndrome in diabetes mellitus  |
| Diabetes | 93878  | Type I diabetes mellitus with ulcer  |
| Diabetes | 65267  | Type 2 diabetes mellitus with multiple complications                                 |
| Diabetes | 31241  | Diabetes monitoring admin.NOS  |
| Diabetes | 44440  | Insulin dependent diabetes mellitus with hypoglycaemic coma                          |
| Diabetes | 43921  | Unstable type 1 diabetes mellitus  |
| Diabetes | 96235  | Type I diabetes mellitus maturity onset  |
| Diabetes | 59253  | Type 2 diabetes mellitus with arthropathy  |
| Diabetes | 25044  | Blood glucose 14+ mmol/L   |
| Diabetes | 43227  | Type II diabetes mellitus with multiple complications                                |
| Diabetes | 43951  | Diabetic - cooperative patient   |
| Diabetes | 10692  | Type 1 diabetes mellitus with ketoacidosis   |
| Diabetes | 5884   | NIDDM - Non-insulin dependent diabetes mellitus                                      |
| Diabetes | 43493  | Insulin site lipohypertrophy<br>Did not attend DESMOND diabetes structured education |
| Diabetes | 95159  | program  |
| Diabetes | 17886  | Diabetic - follow-up default   |
| Diabetes | 32556  | Diabetes with gangrene   |
| Diabetes | 38617  | Other specified diabetes mellitus with ketoacidosis                                  |
| Diabetes | 98616  | Type II diabetes mellitus with neurological complications                            |
| Diabetes | 52283  | Insulin-dependent diabetes mellitus with neurological comps                          |
| Diabetes | 63017  | Type I diabetes mellitus maturity onset  |
| Diabetes | 51957  | Type I diabetes mellitus with ulcer  |
| Diabetes | 63762  | Diabetes mellitus, adult onset, + unspecified complication                           |
| Diabetes | 12640  | Type 2 diabetes mellitus with nephropathy  |
| Diabetes | 93870  | Referral to XPERT diabetes structured education programme                            |

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|----------|--------|---|
| Diabetes | 31715  | [X] Adverse reaction to glibenclamide   |
| Diabetes | 51261  | Insulin dependent diabetes mellitus   |
| Diabetes | 7777   | Referral to diabetologist   |
| Diabetes | 26108  | Steroid induced diabetes mellitus without complication  |
| Diabetes | 34283  | Diabetes mellitus NOS with ophthalmic manifestation   |
| Diabetes | 102163 | Insulin dependent diabetes mellitus with nephropathy  |
| Diabetes | 61670  | Diab mellit insulin-glucose infus acute myocardial infarct  |
| Diabetes | 97849  | Insulin dependent diabetes maturity onset   |
| Diabetes | 54856  | Diabetes mellitus, adult onset, with ketoacidosis   |
| Diabetes | 17262  | Non-insulin-dependent diabetes mellitus with retinopathy  |
| Diabetes | 608    | Follow-up diabetic assessment   |
| Diabetes | 91943  | Type I diabetes mellitus with polyneuropathy  |
| Diabetes | 97446  | Type 1 diabetes mellitus maturity onset   |
| Diabetes | 49884  | Diabetic pre-pregnancy counselling  |
| Diabetes | 63371  | Diabetes mellitus, adult, + other specified manifestation   |
| Diabetes | 49686  | Adverse reaction to tolbutamide   |
| Diabetes | 52630  | O/E - sight threatening diabetic retinopathy  |
| Diabetes | 49554  | Type 1 diabetes mellitus with diabetic cataract   |
| Diabetes | 1789   | [D]Hyperglycaemia   |
| Diabetes | 97824  | DWBQ - Diabetes wellbeing questionnaire   |
| Diabetes | 38078  | Understands diet - diabetes   |
| Diabetes | 13101  | O/E - left eye proliferative diabetic retinopathy   |
| Diabetes | 100292 | [X]Unspecified diabetes mellitus with renal complications   |
| Diabetes | 3837   | Diabetic maculopathy  |
| Diabetes | 13103  | O/E - left eye preproliferative diabetic retinopathy  |
| Diabetes | 68390  | Type 1 diabetes mellitus with ulcer   |
| Diabetes | 47370  | Diabetology D.V. done   |
| Diabetes | 25041  | Dietary advice for type II diabetes   |
| Diabetes | 93631  | XPERT diabetes structured education programme completed   |
| Diabetes | 51697  | Secondary pancreatic diabetes mellitus  |
| Diabetes | 46079  | HbA1 > 10% - bad control  |
| Diabetes | 54846  | Diabetes monitoring deleted   |
| Diabetes | 103762 | Insulin passport completed  |
| Diabetes | 42831  | Type 1 diabetes mellitus with neurological complications  |
| Diabetes | 11663  | Neuropathic diabetic ulcer - foot   |
| Diabetes | 8842   | Diabetic on insulin   |
| Diabetes | 47409  | Type II diabetes mellitus with polyneuropathy   |
| Diabetes | 47011  | Referral to diabetes structured education programme   |
| Diabetes | 55431  | Pre-existing diabetes mellitus, unspecified<br>Did not complete DAFNE diabetes structured education |
| Diabetes | 97809  | program   |
| Diabetes | 46917  | Type 2 diabetes mellitus with hypoglycaemic coma  |
| Diabetes | 31529  | [X]Insul/oral hypoglyc drugs caus adverse eff therapeut use   |
| Diabetes | 68546  | Diabetes clinic satisfaction questionnaire  |
| Diabetes | 46521  | Seen by diabetologist   |



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| Diabetes | 66689  | [X] Adverse reaction to gliclazide  |
| Diabetes | 102434 | Diabetic erectile dysfunction review  |
| Diabetes | 67905  | Type II diabetes mellitus with neurological complications   |
| Diabetes | 12483  | Advice about blood glucose control  |
| Diabetes | 98392  | Maturity onset diabetes in youth type 1   |
| Diabetes | 40463  | HbA1 7 - 10% - borderline control   |
| Diabetes | 10098  | Other specified diabetes mellitus with other spec comps   |
| Diabetes | 12213  | Patient on maximal tolerated therapy for diabetes   |
| Diabetes | 47315  | Type II diabetes mellitus - poor control  |
| Diabetes | 22305  | Adverse reaction to gliclazide  |
| Diabetes | 38076  | Insulin lipohypertrophy   |
| Diabetes | 69278  | Non-insulin depend diabetes mellitus with diabetic cataract   |
| Diabetes | 64283  | Other specified diabetes mellitus with unspecified comps  |
| Diabetes | 95994  | Diabetic foot screen  |
| Diabetes | 50609  | Pre-existing diabetes mellitus, non-insulin-dependent<br>Non-insulin dependent diabetes mellitus with |
| Diabetes | 72320  | mononeuropathy  |
| Diabetes | 94186  | Diabetes structured education programme completed   |
| Diabetes | 6509   | Insulin dependent diabetes mellitus with retinopathy  |
| Diabetes | 103834 | Sulphonylureas not tolerated  |
| Diabetes | 54601  | Under care of diabetologist   |
| Diabetes | 54600  | Unstable insulin dependent diabetes mellitus  |
| Diabetes | 55842  | Non-insulin-dependent diabetes mellitus with neuro comps  |
| Diabetes | 94699  | Diabetes treatment satisfaction questionnaire   |
| Diabetes | 30648  | Did not attend diabetic retinopathy clinic  |
| Diabetes | 43453  | Diabetes mellitus autosomal dominant  |
| Diabetes | 102549 | Insulin dose<br>Non-insulin-dependent diabetes mellitus with ophthalm                                 |
| Diabetes | 50429  | comps   |
| Diabetes | 42729  | Type I diabetes mellitus with hypoglycaemic coma  |
| Diabetes | 56268  | Type II diabetes mellitus with hypoglycaemic coma   |
| Diabetes | 2475   | Diabetic nephropathy  |
| Diabetes | 38103  | Seen in diabetic nurse consultant clinic  |
| Diabetes | 29979  | Non-insulin-dependent diabetes mellitus without complication  |
| Diabetes | 22884  | Type II diabetes mellitus   |
| Diabetes | 101177 | Diabetic dietary review   |
| Diabetes | 50175  | Diabetic foot risk assessment   |
| Diabetes | 62107  | Type II diabetes mellitus with gangrene   |
| Diabetes | 107361 | Education about diabetes and driving  |
| Diabetes | 94011  | Attended XPERT diabetes structured education programme  |
| Diabetes | 110379 | Diabetic on oral treatment and glucagon-like peptide 1  |
| Diabetes | 63690  | Type 2 diabetes mellitus with gastroparesis   |
| Diabetes | 50527  | Type II diabetes mellitus with polyneuropathy   |
| Diabetes | 66946  | Adverse reaction to tolazamide  |
| Diabetes | 107423 | Diabetes self-management plan review  |
| Diabetes | 93468  | Type 1 diabetes mellitus with peripheral angiopathy   |

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| Diabetes | 35316  | O/E - Right diabetic foot - ulcerated                        |
| Diabetes | 61520  | Iatrogenic hyperinsulinism                                   |
| Diabetes | 102490 | Diabetic assessment of erectile dysfunction                  |
| Diabetes | 13196  | Fundoscopy - diabetic check                                  |
| Diabetes | 108007 | Type I diabetes mellitus with multiple complications         |
| Diabetes | 106953 | Referral to DAFNE diabetes structured educn prog declined    |
| Diabetes | 47328  | O/E - right eye stable treated prolif diabetic retinopathy   |
| Diabetes | 35399  | Diabetes mellitus with peripheral circulatory disorder       |
| Diabetes | 91942  | Type I diabetes mellitus with multiple complications         |
| Diabetes | 66872  | Type I diabetes mellitus with nephropathy                    |
| Diabetes | 43139  | Diabetes mellitus, adult onset, with hyperosmolar coma       |
| Diabetes | 105207 | Referral to community diabetes clinic                        |
| Diabetes | 17247  | Diabetic mononeuritis NOS                                    |
| Diabetes | 48192  | Type II diabetes mellitus with diabetic cataract             |
| Diabetes | 106738 | Diabetic foot screening invitation                           |
| Diabetes | 60107  | Unstable type I diabetes mellitus                            |
| Diabetes | 37648  | Insulin treated non-insulin dependent diabetes mellitus      |
| Diabetes | 22487  | Secondary diabetes mellitus                                  |
| Diabetes | 13194  | Diabetes monitoring 1st letter                               |
| Diabetes | 59991  | Maturity onset diabetes in youth type 2                      |
| Diabetes | 31156  | O/E - Left diabetic foot at moderate risk                    |
| Diabetes | 11433  | O/E - right eye background diabetic retinopathy              |
| Diabetes | 65704  | Type 2 diabetes mellitus with ulcer                          |
| Diabetes | 62674  | Type 2 diabetes mellitus with mononeuropathy                 |
| Diabetes | 9974   | Seen in diabetic eye clinic                                  |
| Diabetes | 13102  | O/E - right eye diabetic maculopathy                         |
| Diabetes | 11626  | Diabetic retinopathy NOS                                     |
| Diabetes | 59288  | Other specified diabetes mellitus with coma                  |
| Diabetes | 98071  | Insulin-dependent diabetes mellitus with ophthalmic comps    |
| Diabetes | 11977  | Referral to diabetes nurse                                   |
| Diabetes | 70316  | Type 2 diabetes mellitus with ophthalmic complications       |
| Diabetes | 103798 | Diabetic medicine  |
| Diabetes | 53630  | Insulin coma   |
| Diabetes | 58639  | Patient held diabetic record declined                        |
| Diabetes | 103772 | Insulin passport given                                       |
| Diabetes | 52041  | O/E - left eye stable treated prolif diabetic retinopathy    |
| Diabetes | 94067  | [X] Adverse reaction to glipzide                             |
| Diabetes | 64446  | Insulin dependent diab mell with peripheral angiopathy       |
| Diabetes | 14803  | Diabetes mellitus, adult onset, no mention of complication   |
| Diabetes | 19381  | Referral to diabetic eye clinic                              |
| Diabetes | 52237  | Patient held diabetic record issued                          |
| Diabetes | 104374 | Provision of diabetes clinical summary                       |
| Diabetes | 57356  | Adverse reaction to glibenclamide                            |
| Diabetes | 56448  | Insulin-dependent diabetes without complication              |
| Diabetes | 52104  | Insulin dependent diabetes mellitus with multiple complicatn |

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| Diabetes | 9958   | Hb. A1C - diabetic control  |
| Diabetes | 102201 | Type II diabetes mellitus with nephropathy  |
| Diabetes | 96143  | Insulin initiation - enhanced services administration   |
| Diabetes | 32619  | Patient diabetes education review   |
| Diabetes | 1038   | Insulin dependent diabetes mellitus   |
| Diabetes | 16491  | Diabetes mellitus with polyneuropathy   |
| Diabetes | 68843  | Diabetes mellitus, adult onset, with ketoacidotic coma  |
| Diabetes | 59725  | Type II diabetes mellitus with ophthalmic complications   |
| Diabetes | 39317  | Diabetes mellitus, adult onset, + neurological manifestation  |
| Diabetes | 22023  | Diabetic - poor control NOS   |
| Diabetes | 68105  | Type 1 diabetes mellitus with mononeuropathy  |
| Diabetes | 14049  | Hb. A1C - diabetic control NOS  |
| Diabetes | 26855  | Unstable insulin dependent diabetes mellitus  |
| Diabetes | 53392  | Type II diabetes mellitus without complication  |
| Diabetes | 60499  | Insulin dependent diabetes mellitus with gangrene   |
| Diabetes | 102611 | Type 2 diabetic dietary review  |
| Diabetes | 49655  | Type II diabetes mellitus with retinopathy  |
| Diabetes | 21983  | Type 1 diabetes mellitus with renal complications   |
| Diabetes | 30247  | Adverse reaction to insulins  |
| Diabetes | 22959  | Chronic hyperglycaemia  |
| Diabetes | 35107  | Diabetes mellitus with nephropathy NOS  |
| Diabetes | 66274  | Insulin needles changed for each injection  |
| Diabetes | 9897   | Diabetes monitoring admin.  |
| Diabetes | 58159  | Insulin therapy declined  |
| Diabetes | 57389  | Patient consent given for addition to diabetic register   |
| Diabetes | 66475  | Diabetic monitoring - lower risk albumin excretion  |
| Diabetes | 47649  | Type 1 diabetes mellitus with ophthalmic complications  |
| Diabetes | 43857  | Lipoatrophic diabetes mellitus  |
| Diabetes | 66145  | Type I diabetes mellitus with ketoacidotic coma   |
| Diabetes | 8836   | Diabetes management plan given  |
| Diabetes | 9145   | DNA - Did not attend diabetic clinic  |
| Diabetes | 103902 | Type II diabetes mellitus with arthropathy  |
| Diabetes | 97474  | Unstable type 1 diabetes mellitus   |
| Diabetes | 95351  | Type II diabetes mellitus with mononeuropathy   |
| Diabetes | 95343  | Type I diabetes mellitus with retinopathy<br>Did not complete DESMOND diabetes structured educat<br>program |
| Diabetes | 95093  |   |
| Diabetes | 94647  | Diabetes screening administration   |
| Diabetes | 94330  | Referral to diabetes special interest general practitioner  |
| Diabetes | 13071  | Diabetic - good control   |
| Diabetes | 18387  | Type 1 diabetes mellitus with retinopathy   |
| Diabetes | 24693  | Non-insulin dependent diabetes mellitus with arthropathy  |
| Diabetes | 37806  | Type 2 diabetes mellitus with peripheral angiopathy   |
| Diabetes | 11471  | Diabetes medication review  |
| Diabetes | 63364  | [X] Adverse reaction to insulins  |

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| Diabetes | 711    | Diabetes mellitus  |
| Diabetes | 31157  | O/E - Right diabetic foot at moderate risk   |
| Diabetes | 30294  | Type 1 diabetes mellitus with persistent microalbuminuria                                |
| Diabetes | 93530  | Attended DESMOND structured programme<br>DESMOND diabetes structured education programme |
| Diabetes | 93529  | completed  |
| Diabetes | 102946 | Insulin-dependent diabetes mellitus with renal complications                             |
| Diabetes | 18496  | Type 2 diabetes mellitus with retinopathy  |
| Diabetes | 47816  | Type II diabetes mellitus with neuropathic arthropathy                                   |
| Diabetes | 41716  | Insulin dependent diabetes mellitus with polyneuropathy                                  |
| Diabetes | 49074  | Type 2 diabetes mellitus with ulcer  |
| Diabetes | 12682  | Patient offered diabetes structured education programme                                  |
| Diabetes | 57723  | Referral to diabetic register  |
| Diabetes | 52303  | Non-insulin-dependent diabetes mellitus with renal comps                                 |
| Diabetes | 68928  | Adverse reaction to insulins and antidiabetic agents                                     |
| Diabetes | 53238  | Diabetic drug side effects   |
| Diabetes | 45250  | Under care of diabetic liaison nurse   |
| Diabetes | 100422 | Discharged from diabetes shared care programme   |
| Diabetes | 90301  | Insulin needles changed daily  |
| Diabetes | 89737  | Adverse reaction to glipizide  |
| Diabetes | 12225  | Refer, diabetic liaison nurse  |
| Diabetes | 45276  | Insulin dependent diabetes mellitus with multiple complicat                              |
| Diabetes | 88365  | Glitazones contraindicated   |
| Diabetes | 46963  | Insulin-dependent diabetes mellitus with renal complications                             |
| Diabetes | 47321  | Type 2 diabetes mellitus with ophthalmic complications                                   |
| Diabetes | 18143  | Type II diabetes mellitus with arthropathy   |
| Diabetes | 82474  | Referral to community diabetes specialist nurse  |
| Diabetes | 37035  | HbA1c target   |
| Diabetes | 18142  | Diabetic cheiroarthropathy   |
| Diabetes | 42762  | Type 2 diabetes mellitus with retinopathy  |
| Diabetes | 31240  | Diabetes monitor.verbal invite   |
| Diabetes | 104287 | Referral to community diabetes service   |
| Diabetes | 31310  | Insulin dependent diabetes maturity onset  |
| Diabetes | 62526  | [X] Adverse reaction to tolazamide   |
| Diabetes | 18209  | Type 2 diabetes mellitus with renal complications  |
| Diabetes | 101311 | Insulin dependent diabetes mellitus with polyneuropathy                                  |
| Diabetes | 35321  | Non-urgent diabetic admission  |
| Diabetes | 12455  | Type I diabetes mellitus   |
| Diabetes | 105337 | Type I diabetes mellitus - poor control  |
| Diabetes | 64357  | Diabetes mellitus NOS with unspecified complication                                      |
| Diabetes | 15690  | Diabetes mellitus with ketoacidotic coma   |
| Diabetes | 107793 | Diabetic foot screening invitation third letter  |
| Diabetes | 28873  | Diabetic 6 month review  |
| Diabetes | 70448  | Diabetes mellitus, juvenile +peripheral circulatory disorder                             |
| Diabetes | 23479  | Bronzed diabetes   |

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| Diabetes | 106061 | Type II diabetes mellitus with ketoacidotic coma             |
| Diabetes | 69748  | Diabetes mellitus, juvenile type, + ophthalmic manifestation |
| Diabetes | 12307  | Diabetes care by hospital only                               |
| Diabetes | 758    | Type 2 diabetes mellitus                                     |
| Diabetes | 107881 | Clinical diabetic nephropathy                                |
| Diabetes | 18390  | Type 2 diabetes mellitus with persistent microalbuminuria    |
| Diabetes | 110344 | Diabetic on non-insulin injectable medication                |
| Diabetes | 10755  | Non proliferative diabetic retinopathy                       |
| Diabetes | 17313  | Diabetic iritis  |
| Diabetes | 51756  | Type 2 diabetes mellitus with ketoacidotic coma              |
| Diabetes | 42505  | Diabetes mellitus NOS with ketoacidosis                      |
| Diabetes | 69676  | Type 1 diabetes mellitus without complication                |
| Diabetes | 3550   | Diabetic monitoring  |
| Diabetes | 13100  | O/E - no right diabetic retinopathy                          |
| Diabetes | 99311  | Type I diabetes mellitus with ophthalmic complications       |
| Diabetes | 13191  | Diabetes clinic administration                               |
| Diabetes | 105446 | Insulin administration education                             |
| Diabetes | 29041  | Date diabetic treatment start                                |
| Diabetes | 100436 | Education in self management of diabetes                     |
| Diabetes | 11848  | Renal diabetes   |
| Diabetes | 96010  | Insulin treatment initiated                                  |
| Diabetes | 25627  | Type 2 diabetes mellitus - poor control                      |
| Diabetes | 107464 | Diabetes Year of Care annual review                          |
| Diabetes | 30477  | High risk proliferative diabetic retinopathy                 |
| Diabetes | 11047  | Conversion to insulin  |
| Diabetes | 102768 | Did not attend diabetes foot screening                       |
| Diabetes | 21420  | Loss of hypoglycaemic warning                                |
| Diabetes | 99719  | Insulin-dependent diabetes without complication              |
| Diabetes | 32359  | Perceived control of insulin-dependent diabetes              |
| Diabetes | 53200  | Diabetes mellitus, juvenile type, with ketoacidosis          |
| Diabetes | 17067  | Autonomic neuropathy due to diabetes                         |
| Diabetes | 32193  | Steroid induced diabetes                                     |
| Diabetes | 62613  | Type I diabetes mellitus without complication                |
| Diabetes | 103817 | Informed dissent not to carry insulin passport               |
| Diabetes | 47377  | Other specified diabetes mellitus with ophthalmic complicatn |
| Diabetes | 26604  | Diabetic diet - good compliance                              |
| Diabetes | 64571  | Type II diabetes mellitus with nephropathy                   |
| Diabetes | 106218 | Declined diabetic retinopathy screening                      |
| Diabetes | 8306   | Referral to diabetes nurse                                   |
| Diabetes | 101456 | Diabetic dietary review declined                             |
| Diabetes | 55075  | Type II diabetes mellitus with ulcer                         |
| Diabetes | 39420  | Myasthenic syndrome due to diabetic amyotrophy               |
| Diabetes | 106722 | Diabetic foot screening invitation second letter             |
| Diabetes | 34912  | Non-insulin dependent diabetes mellitus with ulcer           |
| Diabetes | 65616  | Insulin dependent diabetes mellitus with arthropathy         |

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| Diabetes             | 29218  | Hb. A1C 7-10% - borderline   |
| Diabetes             | 101728 | Diabetic on subcutaneous treatment   |
| Diabetes             | 1407   | Insulin treated Type 2 diabetes mellitus   |
| Diabetes             | 64449  | Unspecified diabetes mellitus with multiple complications  |
| Diabetes             | 20696  | Injection sites - diabetic   |
| Diabetes             | 24458  | Type II diabetes mellitus - poor control   |
| Diabetes             | 99231  | Type I diabetes mellitus with mononeuropathy   |
| Diabetes             | 100770 | Insulin dependent diabetes mellitus with diabetic cataract   |
| Diabetes             | 109103 | Type II diabetes mellitus without complication   |
| Diabetes             | 49276  | Insulin-dependent diabetes mellitus with ophthalmic comps  |
| Diabetes             | 40023  | Diabetes mellitus, juvenile type, with hyperosmolar coma   |
| Diabetes             | 7328   | Cellulitis in diabetic foot  |
| Diabetes             | 12506  | Diabetes: practice programme   |
| Diabetes             | 36695  | Diabetes mellitus autosomal dominant type 2  |
| Diabetes             | 57333  | Diabetic cheirography  |
| Diabetes             | 24836  | Type 2 diabetes mellitus with nephropathy  |
| Diabetes             | 71476  | [X] Adverse reaction to gliquidone   |
| Diabetes             | 45913  | Type 2 diabetes mellitus - poor control  |
| Diabetes             | 65062  | Diabetes mellitus NOS with ketoacidotic coma   |
| Diabetes             | 24694  | Insulin dependent diabetes mellitus with mononeuropathy  |
| Diabetes             | 18396  | Adverse reaction to metformin hydrochloride  |
| Diabetes             | 506    | Non-insulin dependent diabetes mellitus  |
| Diabetes             | 1682   | Diabetes mellitus with ketoacidosis  |
| Diabetes             | 44982  | Type 2 diabetes mellitus with diabetic cataract  |
| Diabetes             | 105302 | Proteinuric diabetic nephropathy   |
| Diabetes             | 13197  | Attends diabetes monitoring  |
| Diabetes             | 50813  | Type II diabetes mellitus with mononeuropathy  |
| Diabetes             | 93704  | Referral to DAFNE diabetes structured education programme  |
| Diabetes             | 38986  | Diabetes mellitus with no mention of complication  |
| Diabetes             | 107508 | Conversion to insulin by diabetes specialist nurse   |
| Diabetes             | 10977  | Diabetic peripheral neuropathy screening   |
| Diabetes             | 61122  | Diabetes mellitus induced by non-steroid drugs   |
| Diabetes             | 107452 | Further diabetic monitoring  |
| Diabetes             | 35785  | Chronic painful diabetic neuropathy  |
| Diabetes             | 100964 | Type II diabetes mellitus with ophthalmic complications<br>Did not attend XPERT diabetes structured education<br>programme |
| Diabetes             | 94955  |  |
| Diabetes             | 53634  | [D]Gangrene of toe in diabetic   |
| Diabetes             | 49869  | Type 2 diabetes mellitus with arthropathy  |
| Diabetes             | 69993  | Type 1 diabetes mellitus with gangrene   |
| Diabetes             | 24327  | Ischaemic ulcer diabetic foot  |
| Diabetes             | 50225  | Type II diabetes mellitus with renal complications   |
| Diabetes             | 105937 | Referral to community diabetes specialist nurse declined   |
| Diabetic Retinopathy | 52041  | O/E - left eye stable treated prolif diabetic retinopathy  |
| Diabetic Retinopathy | 13102  | O/E - right eye diabetic maculopathy   |

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| Diabetic Retinopathy | 47328  | O/E - right eye stable treated prolif diabetic retinopathy |
| Diabetic Retinopathy | 1323   | Diabetic retinopathy                                       |
| Diabetic Retinopathy | 10099  | Advanced diabetic maculopathy                              |
| Diabetic Retinopathy | 101881 | Impaired vision due to diabetic retinopathy                |
| Diabetic Retinopathy | 13103  | O/E - left eye preproliferative diabetic retinopathy       |
| Diabetic Retinopathy | 13101  | O/E - left eye proliferative diabetic retinopathy          |
| Diabetic Retinopathy | 11129  | O/E - left eye background diabetic retinopathy             |
| Diabetic Retinopathy | 2986   | Preproliferative diabetic retinopathy                      |
| Diabetic Retinopathy | 7069   | Background diabetic retinopathy                            |
| Diabetic Retinopathy | 30477  | High risk proliferative diabetic retinopathy               |
| Diabetic Retinopathy | 52630  | O/E - sight threatening diabetic retinopathy               |
| Diabetic Retinopathy | 13099  | O/E - right eye preproliferative diabetic retinopathy      |
| Diabetic Retinopathy | 13108  | O/E - left eye diabetic maculopathy                        |
| Diabetic Retinopathy | 3286   | Proliferative diabetic retinopathy                         |
| Diabetic Retinopathy | 10755  | Non proliferative diabetic retinopathy                     |
| Diabetic Retinopathy | 13097  | O/E - right eye proliferative diabetic retinopathy         |
| Diabetic Retinopathy | 11626  | Diabetic retinopathy NOS                                   |
| Diabetic Retinopathy | 9835   | O/E - diabetic maculopathy present both eyes               |
| Diabetic Retinopathy | 11433  | O/E - right eye background diabetic retinopathy            |
| Diabetic Retinopathy | 3837   | Diabetic maculopathy                                       |
| Diabetic Retinopathy | 65463  | High risk non proliferative diabetic retinopathy           |
| Diabetic Retinopathy | 47584  | Advanced diabetic retinal disease                          |
| Endophthalmitis      | 18898  | Phacoanaphylactic endophthalmitis                          |
| Endophthalmitis      | 28431  | Other endophthalmitis                                      |
| Endophthalmitis      | 112641 | Unspecified purulent endophthalmitis                       |
| Endophthalmitis      | 48128  | Panophthalmitis  |
| Endophthalmitis      | 32145  | Acute endophthalmitis                                      |
| Endophthalmitis      | 49756  | Chronic endophthalmitis                                    |
| Endophthalmitis      | 68759  | Parasitic endophthalmitis NOS                              |
| Endophthalmitis      | 29420  | Purulent endophthalmitis                                   |
| Endophthalmitis      | 19986  | Purulent endophthalmitis NOS                               |
| Endophthalmitis      | 35453  | Other endophthalmitis NOS                                  |
| Eye Injury           | 494    | Eye injury   |
| Eye Injury           | 43180  | [X]Other injuries of eye and orbit                         |
| Eye Injury           | 33854  | Superficial injury of cornea NOS                           |
| Eye Injury           | 22528  | Glaucoma due to ocular trauma                              |
| Eye Injury           | 30642  | Commotio retinae   |
| Eye Injury           | 38767  | Superficial injury of cornea                               |
| Eye Injury           | 4838   | Contusion, eye NOS   |
| Eye Injury           | 17870  | Contusion, eyeball   |
| Eye Injury           | 21161  | Bruise of eyelids  |
| Eye Injury           | 19309  | Eye laceration, unspecified                                |
| Eye Injury           | 20411  | Contusion, orbital tissues                                 |
| Eye Injury           | 29766  | Open wound of ocular adnexa                                |
| Eye Injury           | 28846  | Open wound of eyeball                                      |

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|------------|-------|---|
| Eye Injury | 42691 | Enucleation of eye - traumatic                              |
| Eye Injury | 12615 | Bruise of eye   |
| Eye Injury | 27554 | Ocular laceration with intraocular prolapse                 |
| Eye Injury | 97535 | [X]Injury of conjunctiva and corneal abrasion without menti |
| Eye Injury | 24583 | Superficial injury to head, excluding eye                   |
| Eye Injury | 6149  | Superficial injury of eye and adnexa                        |
| Eye Injury | 42440 | Open wound of eyeball NOS                                   |
| Eye Injury | 53690 | Avulsion of eye   |
| Eye Injury | 8972  | Superficial eye injuries NOS                                |
| Eye Injury | 48880 | Open wound of ocular adnexa NOS                             |
| Eye Injury | 64112 | Other open ocular adnexa wound                              |
| Eye Injury | 49298 | Ocular laceration without intraocular prolapse              |
| Eye Injury | 2400  | Black eye NOS   |
| Eye Injury | 16906 | Contusion, eye and adnexa                                   |
| Eye Injury | 52810 | Ocular open wound   |
| Eye Injury | 46591 | Bruise of periocular tissue                                 |
| Eye Injury | 16886 | Open wound of eye   |
| Eye Injury | 10416 | Superficial injury of conjunctiva                           |
| Eye Injury | 15188 | Contusion, eyelids and periocular tissues                   |
| Eye Injury | 9347  | Superficial laceration of cornea                            |
| Eye Injury | 9606  | Eyelid injury   |
| Eye Injury | 17244 | Sequelae of injury of eye and orbit                         |
| Eye Injury | 56284 | [X]Injury of eye and orbit, part unspecified                |
| Glaucoma   | 18743 | Pseudoexfoliation glaucoma                                  |
| Glaucoma   | 4581  | Primary open-angle glaucoma                                 |
| Glaucoma   | 8001  | Glaucoma NOS  |
| Glaucoma   | 39120 | Primary angle-closure glaucoma NOS                          |
| Glaucoma   | 93967 | Laser suture lysis following glaucoma surgery               |
| Glaucoma   | 42447 | Unspecified open-angle glaucoma                             |
| Glaucoma   | 53879 | Normal pressure glaucoma                                    |
| Glaucoma   | 8955  | H/O: glaucoma   |
| Glaucoma   | 91442 | Removal of releasable suture following glaucoma surgery     |
| Glaucoma   | 54262 | Glaucoma associated with disorders of the lens              |
| Glaucoma   | 44817 | Intermittent primary angle-closure glaucoma                 |
| Glaucoma   | 1798  | Open-angle glaucoma   |
| Glaucoma   | 12251 | Pigmentary glaucoma   |
| Glaucoma   | 9469  | Low tension glaucoma  |
| Glaucoma   | 68094 | Steroid-induced glaucoma residual stage                     |
| Glaucoma   | 8971  | Borderline glaucoma   |
| Glaucoma   | 44295 | Other specified glaucoma NOS                                |
| Glaucoma   | 11058 | Neovascular glaucoma  |
| Glaucoma   | 2823  | Primary angle-closure glaucoma                              |
| Glaucoma   | 67341 | Glaucoma due to iris anomaly                                |
| Glaucoma   | 28189 | Open-angle glaucoma NOS                                     |
| Glaucoma   | 46069 | Operations following glaucoma surgery                       |



|          |        |  |
|----------|--------|--|
| Glaucoma | 28536  | Acute primary angle-closure glaucoma                       |
| Glaucoma | 26870  | Glaucoma due to ocular inflammation                        |
| Glaucoma | 41794  | Glaucoma due to ocular vascular disorder                   |
| Glaucoma | 36737  | Borderline glaucoma steroid responder                      |
| Glaucoma | 53521  | Glaucoma associated with other ocular disorders NOS        |
| Glaucoma | 52888  | [X]Glaucoma  |
| Glaucoma | 22805  | Glaucoma due to unspecified ocular disorder                |
| Glaucoma | 98647  | [X]Glaucoma in endocrine,nutritional+metabolic diseases CE |
| Glaucoma | 28505  | Other specified forms of glaucoma                          |
| Glaucoma | 65193  | Glaucoma due to episode of increased venous pressure       |
| Glaucoma | 10070  | Open angle glaucoma with borderline intraocular pressure   |
| Glaucoma | 30649  | Simple chronic glaucoma                                    |
| Glaucoma | 63660  | Hypersecretion glaucoma                                    |
| Glaucoma | 64851  | Glaucoma due to systemic syndrome                          |
| Glaucoma | 37876  | Glaucoma due to pupillary block                            |
| Glaucoma | 8132   | Low tension glaucoma                                       |
| Glaucoma | 34354  | Glaucoma associated with disorders of the lens NOS         |
| Glaucoma | 35446  | Chronic primary angle-closure glaucoma                     |
| Glaucoma | 70195  | [X]Other glaucoma  |
| Glaucoma | 53127  | Glaucoma associated with other ocular disorders            |
| Glaucoma | 41854  | Glaucoma due to disease EC                                 |
| Glaucoma | 44338  | Glaucoma - absolute  |
| Glaucoma | 69195  | Glaucoma due to chamber angle anomaly                      |
| Glaucoma | 95852  | Operations following glaucoma surgery NOS                  |
| Glaucoma | 88142  | Other specified operations following glaucoma surgery      |
| Glaucoma | 41804  | Glaucoma due to disease NOS                                |
| Glaucoma | 65079  | Needling of bleb following glaucoma surgery                |
| Glaucoma | 20520  | Unspecified primary angle-closure glaucoma                 |
| Glaucoma | 20230  | Optic disc glaucomatous atrophy                            |
| Glaucoma | 89934  | Injection of bleb following glaucoma surgery               |
| Glaucoma | 48479  | Glaucoma due to ocular tumour or cyst                      |
| Glaucoma | 48132  | Steroid-induced glaucoma NOS                               |
| Glaucoma | 6315   | Closed angle glaucoma                                      |
| Glaucoma | 72394  | Open-angle glaucoma residual stage                         |
| Glaucoma | 67413  | Primary angle-closure glaucoma residual stage              |
| Glaucoma | 88595  | Revision of bleb NEC following glaucoma surgery            |
| Glaucoma | 44798  | Phacolytic glaucoma  |
| Glaucoma | 11059  | Pan retinal photocoagulation for glaucoma                  |
| Glaucoma | 35528  | Steroid-induced glaucoma                                   |
| Glaucoma | 22528  | Glaucoma due to ocular trauma                              |
| Glaucoma | 2074   | Glaucoma   |
| Glaucoma | 96707  | Glaucoma due to other anterior segment anomaly             |
| Glaucoma | 107168 | Glaucomatous subcapsular flecks                            |
| Glaucoma | 68633  | Glaucoma in endocrine, nutritional and metabolic diseases  |
| Glaucoma | 100303 | Glaucoma due to ocular cyst                                |

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|-----|--------|--|
| HIV | 101191 | Human immunodeficiency virus annual review   |
| HIV | 96902  | Human immunodeficiency virus viral load by log rank  |
| HIV | 23763  | AIDS carrier   |
| HIV | 8281   | HIV disease resulting in wasting syndrome<br>[X]HIV disease result/haematological+immunologic<br>abnorms,NEC               |
| HIV | 96751  |  |
| HIV | 70528  | Human immunodeficiency virus with secondary infection  |
| HIV | 2835   | HIV positive   |
| HIV | 102117 | [X]HIV disease resulting in multiple infections  |
| HIV | 50076  | HIV disease resulting in multiple infections   |
| HIV | 62854  | [X]Human immunodeficiency virus disease  |
| HIV | 23770  | Acquired immune deficiency syndrome  |
| HIV | 69767  | [X]HIV disease resulting in other non-Hodgkin's lymphoma   |
| HIV | 67575  | HIV disease resulting in unspecified malignant neoplasm  |
| HIV | 9130   | Human immunodeficiency virus infection   |
| HIV | 27053  | HIV viral load   |
| HIV | 44617  | HIV disease resulting in Burkitt's lymphoma  |
| HIV | 102252 | [X]HIV disease resulting in other specified conditions   |
| HIV | 44303  | Human immunodef virus resulting in other disease   |
| HIV | 27853  | HIV disease resulting in Kaposi's sarcoma  |
| HIV | 27641  | HIV disease resulting in Pneumocystis carinii pneumonia<br>Acquired human immunodeficiency virus infection syndrome        |
| HIV | 36294  | NOS  |
| HIV | 100769 | [X]Unspecified human immunodeficiency virus [HIV] disease  |
| HIV | 58859  | Asymptomatic human immunodeficiency virus infection<br>[V]Asymptomatic human immunodeficiency virus infection<br>status    |
| HIV | 24872  |  |
| HIV | 43537  | HIV 1 nucleic acid detection   |
| HIV | 41185  | [X]Dementia in human immunodef virus [HIV] disease   |
| HIV | 53636  | Human immunodeficiency virus with neurological disease   |
| HIV | 65117  | HIV disease resulting in lymphoid interstitial pneumonitis<br>HIV disease result/haematological+immunologic<br>abnorms,NEC |
| HIV | 47632  |  |
| HIV | 69766  | HIV infection with persistent generalised lymphadenopathy  |
| HIV | 66367  | HIV dis resulting oth types of non-Hodgkin's lymphoma<br>[D]Laboratory evidence of human immunodeficiency virus<br>[HIV]   |
| HIV | 44288  |  |
| HIV | 58857  | Acute human immunodeficiency virus infection   |
| HIV | 66368  | HIV disease resulting in cytomegaloviral disease   |
| HIV | 62891  | Human immunodeficiency virus with other clinical findings  |
| HIV | 33943  | Notification of AIDS   |
| HIV | 71450  | HIV disease resulting/unspcf infectious+parasitic disease  |
| HIV | 70869  | Human immunodeficiency virus with constitutional disease   |
| HIV | 93642  | Human immunodeficiency virus RNA/DNA ratio   |
| HIV | 23951  | HIV disease resulting in candidiasis   |
| HIV | 51708  | HIV dis reslt/oth mal neopl/lymph,h'matopoetc+reltd tissu  |

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|-------------|--------|---|
| HIV         | 37006  | HIV disease resulting in mycobacterial infection                                      |
| HIV         | 101836 | Human immunodeficiency virus with secondary cancers                                   |
| HSV1        | 1304   | Cold sore (herpetic)  |
| HSV1        | 48716  | Herpes simplex septicaemia  |
| HSV1        | 8248   | O/E - herpes labialis   |
| HSV1        | 9002   | O/E - cold sore   |
| HSV1        | 93622  | Herpes simplex virus type 1 nucleic acid detection                                    |
| HSV1        | 47973  | Herpes simplex pneumonia  |
| HSV1        | 10408  | Herpes simplex dendritic keratitis  |
| HSV1        | 16925  | [X] Herpes labialis   |
| HSV1        | 1082   | Herpes simplex disciform keratitis  |
| HSV1        | 96106  | Genital herpes simplex type 1   |
| HSV1        | 17500  | Herpes simplex eyelid dermatitis  |
| HSV1        | 1083   | Ophthalmic herpes simplex   |
| HSV1        | 39702  | Herpetic aphthous ulceration  |
| HSV1        | 17131  | Herpesviral vesicular dermatitis  |
| HSV1        | 1601   | Herpes labialis   |
| HSV1        | 54934  | Encephalitis due to herpes simplex virus  |
| HSV1        | 96826  | Recurrent genital herpes simplex type 1   |
| HSV1        | 24531  | Herpes simplex with unspecified complication  |
| HSV1        | 32206  | Herpes simplex otitis externa   |
| HSV1        | 15791  | O/E-herpes labialis-cold sore   |
| HSV1        | 6176   | Stomatitis - herpetic   |
| HSV1        | 11806  | Herpetic gingivostomatitis  |
| HSV1        | 41245  | Herpes simplex encephalitis   |
| HSV1        | 43334  | Herpes simplex ophthalmicus   |
| HSV1        | 5078   | Unspecified ophthalmic herpes   |
| HSV1        | 61223  | Herpes simplex iridocyclitis  |
| HSV1        | 67338  | Infective otitis externa due to herpes simplex  |
| HSV1        | 40712  | Ophthalmic herpes simplex NOS   |
| HSV1        | 48648  | Herpes simplex- otitis externa  |
| HSV1        | 43003  | Congenital herpes simplex   |
| Head Injury | 59959  | Closed #skull vlt with intracranial injury+concussion unspec                          |
| Head Injury | 99282  | Open #skull bse + intracranial injury, LOC unspec duration                            |
| Head Injury | 39859  | Multiple skull fractures  |
| Head Injury | 4088   | Late effect of intracranial injury without skull fracture                             |
| Head Injury | 7036   | Head injury - nursing supervis<br>Intracran inj NOS no open intracran wnd+>24hr LOC - |
| Head Injury | 71778  | restored  |
| Head Injury | 62977  | Closed fracture base of skull without intracranial injury                             |
| Head Injury | 112563 | Closed #skull bse + intracranial injury, <1hr loss of consc                           |
| Head Injury | 52391  | Intracranial inj NOS + open intracranial wound+no loss consc                          |
| Head Injury | 16880  | Sequelae of superficial injury of head  |
| Head Injury | 73441  | Open #skull vlt + intracranial injury, no loss of consc                               |
| Head Injury | 58688  | Closed #skull bse no intracranial injury, unspec state consc                          |

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|-------------|--------|--|
| Head Injury | 27806  | Multiple injuries of head<br>Intracranial inj NOS no open intracran wnd+concussion |
| Head Injury | 66754  | unspec   |
| Head Injury | 92383  | Crushing injury of head, part unspecified  |
| Head Injury | 112568 | Closed #skull bse + intracranial injury, no loss of consc                          |
| Head Injury | 27657  | Closed fracture vault of skull with intracranial injury                            |
| Head Injury | 96755  | Late effect of injury to blood vessel head/neck/extremities                        |
| Head Injury | 57328  | Skull fracture NOS   |
| Head Injury | 103095 | Splinter of head, without major open wound, infected, NOS                          |
| Head Injury | 33515  | Multiple fractures involving skull and facial bones                                |
| Head Injury | 72754  | Intracranial inj NOS + open intracranial wnd + unspec consc                        |
| Head Injury | 20195  | Fracture of vault of skull NOS   |
| Head Injury | 62841  | Closed #skull vlt + intracranial injury, LOC unspec duration                       |
| Head Injury | 51308  | Intracranial injury NOS + open intracranial wound                                  |
| Head Injury | 67340  | Intracranial inj NOS no open intracran wnd+1-24hr loss consc                       |
| Head Injury | 107041 | Mult #skull/face + other bones, open + intracranial injury                         |
| Head Injury | 115076 | Open #skull vlt + intracranial injury, <1hr loss of consc                          |
| Head Injury | 65724  | Closed #skull vlt no intracranial injury, unspec state consc                       |
| Head Injury | 111559 | Closed #skull bse + intracranial injury + concussion unspec                        |
| Head Injury | 94450  | Closed #skull bse no intracranial injury, <1hr loss of consc                       |
| Head Injury | 15184  | Fracture of vault of skull   |
| Head Injury | 73430  | Closed #skull vlt no intracranial injury + concussion unspec                       |
| Head Injury | 28260  | Open wound of head, neck and trunk NOS   |
| Head Injury | 98032  | Other head and neck blood vessel injury  |
| Head Injury | 34124  | Intracranial inj NOS no open intracran wnd + unspec consc                          |
| Head Injury | 54567  | Fracture of skull due to birth trauma  |
| Head Injury | 73790  | Intracranial injury with prolonged coma with open wound                            |
| Head Injury | 12783  | Injury of blood vessels of head, NEC   |
| Head Injury | 94692  | [X]Fracture of skull and facial bones, part unspecified                            |
| Head Injury | 110730 | Intracran inj NOS + open intracran wnd+>24hr LOC -restored                         |
| Head Injury | 285    | Open wound of head NOS   |
| Head Injury | 52865  | [X]Injuries to the head  |
| Head Injury | 36121  | Superficial injuries involving head with neck                                      |
| Head Injury | 16181  | Other open wound of head   |
| Head Injury | 42554  | Intracranial inj NOS no open intracran wnd+no loss consc                           |
| Head Injury | 32298  | Intracranial injury, excluding those with skull fracture NOS                       |
| Head Injury | 45956  | Closed #skull bse + intracranial injury, LOC unspec duration                       |
| Head Injury | 64441  | Injury to blood vessels of head and neck   |
| Head Injury | 56509  | Intracranial inj NOS + open intracran wnd+concussion unspec                        |
| Head Injury | 65647  | Intracranial injury with prolonged coma without open wound                         |
| Head Injury | 6431   | H/O: head injury   |
| Head Injury | 108055 | Non-accidental traumatic head injury to child                                      |
| Head Injury | 73411  | Mult #skull/face + other bones, open, no intracranial injury                       |
| Head Injury | 2864   | Intracranial injury NOS no open intracranial wound                                 |
| Head Injury | 61357  | Open #skull vlt + intracranial injury, LOC unspec duration                         |

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| Head Injury | 24486  | Head and neck superficial nerve injury                       |
| Head Injury | 61388  | Other and unqualified skull fractures                        |
| Head Injury | 11120  | Sequelae of unspecified injury of head                       |
| Head Injury | 28299  | Open wounds involving head with neck                         |
| Head Injury | 109772 | [X]Fractures of other skull and facial bones                 |
| Head Injury | 71963  | Traumatic cerebral oedema without open intracranial wound    |
| Head Injury | 43882  | Discharge from head injury rehabilitation                    |
| Head Injury | 68957  | Splinter of head, without major open wound or infection      |
| Head Injury | 71725  | Closed #skull bse + intracranial injury, >24hr LOC+recovery  |
| Head Injury | 8314   | Minor head injury  |
| Head Injury | 48586  | Superficial injury of head NOS, infection NOS                |
| Head Injury | 10937  | Open wound of forehead                                       |
| Head Injury | 62955  | Closed #skull vlt no intracranial injury, no loss of consc   |
| Head Injury | 61837  | Head and neck blood vessel injury NOS                        |
| Head Injury | 32214  | Focal brain injury   |
| Head Injury | 3803   | Intracran inj NOS no open intracran wnd+LOC unspec duration  |
| Head Injury | 41906  | Superficial injury of head NOS                               |
| Head Injury | 63679  | Closed fracture base of skull with intracranial injury       |
| Head Injury | 40393  | Intracranial injury with prolonged coma                      |
| Head Injury | 102718 | Open #skull bse + intracranial injury + concussion unspec    |
| Head Injury | 47842  | Closed fracture vault of skull without intracranial injury   |
| Head Injury | 54898  | Splinter of head, without major open wound or infection, NOS |
| Head Injury | 34870  | Intracranial injury NOS                                      |
| Head Injury | 15860  | Contusion, forehead  |
| Head Injury | 113378 | Open #skull bse + intracranial injury, unspec state of consc |
| Head Injury | 10201  | Brain injury NOS   |
| Head Injury | 3008   | Head injury  |
| Head Injury | 46142  | Multiple fractures involving skull or face with other bones  |
| Head Injury | 50210  | Late effect of open wound of head, neck and trunk            |
| Head Injury | 50524  | Closed #skull vlt no intracranial injury, <1hr loss of consc |
| Head Injury | 61140  | Intracranial inj NOS + open intracranial wnd+<1hr loss consc |
| Head Injury | 16553  | Head injury NOS  |
| Head Injury | 53035  | Traumatic cerebral oedema                                    |
| Head Injury | 44249  | Head and neck superficial nerve injury                       |
| Head Injury | 60402  | Late effect of skull fracture                                |
| Head Injury | 69737  | Open fracture base skull without mention intracranial injury |
| Head Injury | 98776  | Closed #skull vlt + intracranial injury, <1hr loss of consc  |
| Head Injury | 46543  | Splinter of head, without major open wound, infected         |
| Head Injury | 57644  | Closed fracture of skull NOS without intracranial injury     |
| Head Injury | 6196   | Late effect of head injury                                   |
| Head Injury | 67641  | Late effect of fracture of skull and face bones              |
| Head Injury | 27492  | Closed fracture of skull NOS with intracranial injury        |
| Head Injury | 35456  | Intracranial injury excluding those with skull fracture      |
| Head Injury | 49470  | [X]Other specified injuries of head                          |

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|-------------|--------|---|
| Head Injury | 27632  | Diffuse brain injury  |
| Head Injury | 113103 | Closed #skull vlt no intracranial injury, >24hr LOC+recovery<br>Intracranial inj NOS no open intracran wnd+>24hr          |
| Head Injury | 96846  | LOC+recover   |
| Head Injury | 34826  | Open wound of forehead with complication  |
| Head Injury | 66765  | Closed #skull vlt no intracranial injury, 1-24hr loss consc   |
| Head Injury | 40659  | Crush injury of head  |
| Head Injury | 721    | Fracture of skull   |
| Head Injury | 100796 | Open #skull bse no intracranial injury, <1hr loss of consc  |
| Head Injury | 12659  | Sequelae of open wound of head  |
| Head Injury | 58957  | Closed #skull bse no intracranial injury, no loss of consc  |
| Head Injury | 111430 | [X]Open wound of other parts of head  |
| Head Injury | 23780  | Depressed skull fracture NOS  |
| Head Injury | 24763  | Multiple superficial injuries of head   |
| Head Injury | 44773  | Cleaning of skin wound of head or neck  |
| Head Injury | 64167  | Open #skull vlt + intracranial injury, unspec state of consc  |
| Head Injury | 102084 | Closed #skull bse no intracranial injury, >24hr LOC+recovery  |
| Head Injury | 57246  | Open fracture vault of skull without intracranial injury<br>Intracran inj NOS + open intracran wnd+LOC unspec<br>duration |
| Head Injury | 69281  |   |
| Head Injury | 73451  | Open #skull bse + intracranial injury, >24hr LOC + recovery   |
| Head Injury | 18325  | Other open wound of head  |
| Head Injury | 93200  | Discharge from head injury rehabilitation service   |
| Head Injury | 28050  | Splinter of head, without major open wound or infection   |
| Head Injury | 67603  | Open fracture of skull NOS with intracranial injury   |
| Head Injury | 97064  | Open fracture base of skull with intracranial injury  |
| Head Injury | 66312  | Open #skull vlt no intracranial injury, no loss of consc  |
| Head Injury | 59416  | Other open wound of head with complication  |
| Head Injury | 112451 | Intracranial inj NOS + open intracranial wnd + 1-24hr LOC   |
| Head Injury | 2461   | Fracture of base of skull   |
| Head Injury | 92354  | Mult #skull/face+other bones, closed, no intracranial injury  |
| Head Injury | 33593  | Fracture of base of skull NOS   |
| Head Injury | 73206  | Mult #skull/face+other bones, closed + intracranial injury  |
| Head Injury | 111246 | [X]Sequelae of other specified injury of head   |
| Head Injury | 48651  | Crushing injuries involving head with neck  |
| Head Injury | 6303   | Minor head injury   |
| Head Injury | 66114  | Open #skull vlt no intracranial injury, unspec state consc  |
| Head Injury | 94411  | Open #skull NOS without mention of intracranial injury  |
| Head Injury | 12744  | Open wound of head, neck and trunk  |
| Head Injury | 99018  | Closed #skull vlt + intracranial injury, no loss of consc   |
| Head Injury | 104726 | Open #skull vlt + intracranial injury, >24hr LOC + recovery   |
| Head Injury | 66482  | Splinter of head, without major open wound, infected  |
| Head Injury | 72412  | Closed #skull vlt + intracranial injury, >24hr LOC+recovery   |
| Head Injury | 98577  | [X]Sequelae of unspecified injury of head   |
| Head Injury | 403    | Head injury   |
| Head Injury | 62743  | Open #skull vlt with intracranial injury + concussion unspec  |

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|--------------|--------|---|
| Head Injury  | 24583  | Superficial injury to head, excluding eye   |
| Head Injury  | 93851  | Closed #skull vlt + intracranial injury, 1-24hr loss consc  |
| Head Injury  | 33692  | Fracture of skull NOS   |
| Head Injury  | 71710  | Other head and neck blood vessel injury NOS   |
| Head Injury  | 30203  | Fracture of skull and facial bones  |
| Head Injury  | 18797  | Head injury advice given  |
| Head Injury  | 51299  | Open fracture vault of skull with intracranial injury   |
| Head Injury  | 17467  | Open wound of head  |
| Head Injury  | 64201  | Exploration of wound of skin of head or neck NEC  |
| Head Injury  | 42704  | Post-head injury syndrome   |
| Head Injury  | 50664  | Intracranial inj NOS no open intracran wnd+<1hr loss consc  |
| Head Injury  | 33368  | Intracranial injury NOS   |
| Head Injury  | 17958  | Closed #skull vlt + intracranial injury, unspec state consc   |
| Head Injury  | 50247  | Multiple fractures involving skull/face with other bones NOS  |
| Head Injury  | 114646 | [X]Crushing injury of head, part unspecified  |
| Head Injury  | 57559  | Crushing injury of skull  |
| Head Injury  | 96406  | Closed #skull bse no intracranial injury + concussion unspec  |
| Head Injury  | 107337 | Acquired brain injury   |
| Head Injury  | 59577  | [X]Superficial injury of other parts of head  |
| Head Injury  | 99505  | Open #skull bse + intracranial injury, <1hr loss of consc   |
| Head Injury  | 99072  | Traumatic cerebral oedema with open intracranial wound  |
| Head Injury  | 105137 | Closed #skull bse + intracranial injury, 1-24hr loss consc  |
| Head Injury  | 46277  | Injury of muscle and tendon of head   |
| Hypertension | 204    | Hypertensive disease  |
| Hypertension | 799    | Essential hypertension  |
| Hypertension | 351    | High blood pressure   |
| Hypertension | 102458 | [X]Other secondary hypertension<br>Stage 1 hyperten (NICE 2011) without evidnce end organ<br>damage |
| Hypertension | 108136 |   |
| Hypertension | 3712   | Hypertension NOS  |
| Hypertension | 26347  | Chronic peripheral venous hypertension  |
| Hypertension | 105989 | Severe hypertension (Nat Inst for Health Clinical Ex 2011)  |
| Hypertension | 105316 | Stage 1 hypertension  |
| Hypertension | 21660  | Adverse reaction to other antihypertensives   |
| Hypertension | 12948  | Hypertension treatm.stopped   |
| Hypertension | 83473  | Diastolic hypertension  |
| Hypertension | 99259  | Trial reduction of antihypertensive therapy   |
| Hypertension | 106279 | Trial withdrawal of antihypertensive therapy declined   |
| Hypertension | 18482  | Hypertension six month review   |
| Hypertension | 43935  | Benign hypertensive renal disease   |
| Hypertension | 4372   | Systolic hypertension   |
| Hypertension | 97533  | [X]Hypertension secondary to other renal disorders  |
| Hypertension | 43664  | Pre-eclampsia or eclampsia with pre-existing hypertension   |
| Hypertension | 72226  | Other hypertensive agent poisoning  |
| Hypertension | 30776  | Hypertension:follow-up default  |

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|--------------|--------|--|
| Hypertension | 16565  | Good hypertension control                                    |
| Hypertension | 22333  | Hypertension treatment refused                               |
| Hypertension | 112611 | [X]Poisoning by other antihypertensive drugs, NEC            |
| Hypertension | 18057  | Antihypertensive therapy                                     |
| Hypertension | 102406 | Hypertension 9 month review                                  |
| Hypertension | 102444 | Thromboembolic pulmonary hypertension                        |
| Hypertension | 30770  | [X] Adverse reaction to other antihypertensives              |
| Hypertension | 105487 | Severe hypertension  |
| Hypertension | 42229  | Secondary hypertension NOS                                   |
| Hypertension | 73586  | Other pre-existing hypertension in preg/childb/puerp unspec  |
| Hypertension | 31755  | Secondary malignant hypertension                             |
| Hypertension | 105274 | Stage 2 hypertension (NICE - Nat Ins for Hth Clin Excl 2011) |
| Hypertension | 105371 | Stage 1 hypertension (NICE - Nat Ins for Hth Clin Excl 2011) |
| Hypertension | 10818  | Essential hypertension NOS                                   |
| Hypertension | 51635  | Secondary benign hypertension NOS                            |
| Hypertension | 15377  | Malignant essential hypertension                             |
| Hypertension | 93055  | Pre-eclampsia or eclampsia + pre-existing hypertension NOS   |
| Hypertension | 13188  | Hypertensive treatm.changed                                  |
| Hypertension | 31816  | Hypertensive crisis  |
| Hypertension | 18590  | Moderate hypertension control                                |
| Hypertension | 29310  | Renal hypertension   |
| Hypertension | 31387  | Secondary renovascular hypertension NOS                      |
| Hypertension | 63164  | [X]Oth antihyperten drug caus advers eff in therap use, NEC  |
| Hypertension | 105480 | Hypertension resistant to drug therapy                       |
| Hypertension | 59383  | Secondary malignant renovascular hypertension                |
| Hypertension | 20497  | Adverse reaction to antihypertensives NOS                    |
| Hypertension | 52621  | Pre-exist 2ndry hypertens comp preg childbth and puerperium  |
| Hypertension | 6702   | Hypertensive retinopathy                                     |
| Hypertension | 44350  | [X] Adverse reaction to antihypertensives NOS                |
| Hypertension | 27511  | Poor hypertension control                                    |
| Hypertension | 12680  | Hypertension clinical management plan                        |
| Hypertension | 39649  | Malignant hypertensive renal disease                         |
| Hypertension | 1894   | Benign essential hypertension                                |
| Hypertension | 65081  | Primary pulmonary hypertension drugs Band 3                  |
| Hypertension | 7329   | Secondary hypertension                                       |
| Hypertension | 110631 | Hypertension self-management plan review                     |
| Hypertension | 63946  | Primary pulmonary hypertension drugs Band 2                  |
| Hypertension | 8732   | BP - hypertensive disease                                    |
| Hypertension | 15106  | Hypertensive renal disease NOS                               |
| Hypertension | 62432  | Other pre-existing hypertension in preg/childb/puerp NOS     |
| Hypertension | 57288  | Secondary benign hypertension                                |
| Hypertension | 21826  | Hypertension treatm. started                                 |
| Hypertension | 90875  | Primary pulmonary hypertension drugs Band 4                  |
| Hypertension | 18765  | Other specified hypertensive disease                         |
| Hypertension | 11056  | Patient on maximal tolerated antihypertensive therapy        |



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|--------------------|--------|--|
| Hypertension       | 66567  | Other pre-existing hypertension in preg/childbirth/puerp     |
| Hypertension       | 44549  | Pre-exist hypertension compl preg childbirth and puerperium  |
| Hypertension       | 63260  | Hypertensive agent poisoning NOS                             |
| Hypertension       | 4668   | Hypertensive renal disease                                   |
| Hypertension       | 25371  | Secondary benign renovascular hypertension                   |
| Hypertension       | 34065  | Secondary pulmonary hypertension                             |
| Hypertension       | 107704 | Primary hypertension   |
| Hypertension       | 3979   | Hypertensive encephalopathy                                  |
| Hypertension       | 69753  | [X]Hypertensive diseases                                     |
| Hypertension       | 245    | Primary pulmonary hypertension                               |
| Hypertension       | 85944  | High cost hypertension drugs                                 |
| Hypertension       | 109797 | Stage 1 hyperten (NICE 2011) with evidnce end organ damage   |
| Hypertension       | 16059  | Secondary hypertension NOS                                   |
| Hypertension       | 55603  | Primary pulmonary hypertension drugs Band 1                  |
| Hypertension       | 96743  | Other pre-exist hypertension in preg/childb/puerp-not deliv  |
| Hypertension       | 72030  | Other pre-existing hypertension in preg/childb/puerp - deliv |
| Hypertension       | 95359  | Trial withdrawal of antihypertensive therapy                 |
| Hypertension       | 109611 | Hypertension self-management plan agreed                     |
| Hypertension       | 3425   | On treatment for hypertension                                |
| Hypertension       | 2666   | H/O: hypertension  |
| Hypertension       | 31341  | Hypertension secondary to drug                               |
| Hypertension       | 7057   | Hypertensive disease NOS                                     |
| Hypertension       | 101649 | Other specified high cost hypertension drugs                 |
| Hypertension       | 19070  | Hypertension annual review                                   |
| Hypertension       | 73293  | Secondary malignant hypertension NOS                         |
| Hypertension       | 37086  | Blind hypertensive eye                                       |
| Hypertension       | 34744  | Hypertension secondary to endocrine disorders                |
| Lyme's disease     | 43895  | Arthritis in Lyme disease                                    |
| Lyme's disease     | 109401 | Borrelial lymphocytoma                                       |
| Lyme's disease     | 113749 | Lyme immunoblot reactive                                     |
| Lyme's disease     | 109030 | Lyme arthritis   |
| Lyme's disease     | 42679  | Lyme immunoblot positive                                     |
| Lyme's disease     | 12676  | Erythema chronicum migrans                                   |
| Lyme's disease     | 110767 | Erythema migrans   |
| Lyme's disease     | 109101 | Lyme borreliosis   |
| Lyme's disease     | 4223   | Lyme disease   |
| Lyme's disease     | 99780  | Lyme ELISA reactive  |
| Lyme's disease     | 114863 | Lyme carditis  |
| Lyme's disease     | 110430 | Lingual erythema migrans                                     |
| Lyme's disease     | 63355  | Lyme ELISA positive  |
| Lyme's disease     | 109659 | Lyme neuroborreliosis  |
| Marfan's syndrome  | 936    | Marfan's syndrome  |
| Multiple Sclerosis | 96246  | Secondary progressive multiple sclerosis                     |
| Multiple Sclerosis | 96291  | Benign multiple sclerosis                                    |
| Multiple Sclerosis | 69886  | Multiple sclerosis of the spinal cord                        |

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| Multiple Sclerosis    | 98835  | Management of multiple sclerosis in onset phase              |
| Multiple Sclerosis    | 109302 | Multiple sclerosis monitoring second letter                  |
| Multiple Sclerosis    | 2298   | Exacerbation of multiple sclerosis                           |
| Multiple Sclerosis    | 40344  | Multiple sclerosis of the brain stem                         |
| Multiple Sclerosis    | 50161  | Multiple sclerosis care plan agreed                          |
| Multiple Sclerosis    | 23730  | Generalised multiple sclerosis                               |
| Multiple Sclerosis    | 95864  | Management of multiple sclerosis in stable disability phase  |
| Multiple Sclerosis    | 112194 | Multiple sclerosis monitoring telephone invitation           |
| Multiple Sclerosis    | 20493  | Multiple sclerosis NOS                                       |
| Multiple Sclerosis    | 97487  | Management of multiple sclerosis in early disease phase      |
| Multiple Sclerosis    | 48527  | Spec serv for pat with multiple sclerosis - enh serv admin   |
| Multiple Sclerosis    | 106307 | Multiple sclerosis monitoring administration                 |
| Multiple Sclerosis    | 103740 | Referral to community multiple sclerosis team                |
| Multiple Sclerosis    | 44985  | Multiple sclerosis review                                    |
| Multiple Sclerosis    | 684    | Multiple sclerosis   |
| Multiple Sclerosis    | 43232  | Multiple sclerosis multidisciplinary review                  |
| Multiple Sclerosis    | 98521  | Management of multiple sclerosis in palliative phase         |
| Multiple Sclerosis    | 100503 | Multiple sclerosis review declined                           |
| Multiple Sclerosis    | 107391 | Suspected multiple sclerosis                                 |
| Multiple Sclerosis    | 109049 | Multiple sclerosis monitoring first letter                   |
| Multiple Sclerosis    | 95972  | Relapsing and remitting multiple sclerosis                   |
| Multiple Sclerosis    | 96607  | Primary progressive multiple sclerosis                       |
| Myocardial Infarction | 17464  | Personal history of myocardial infarction                    |
| Myocardial Infarction | 1678   | Inferior myocardial infarction NOS                           |
| Myocardial Infarction | 24126  | Haemopericardium/current comp folow acut myocard infarct     |
| Myocardial Infarction | 7783   | ECG: myocardial infarction                                   |
| Myocardial Infarction | 69474  | Rupture papillary muscle/curr comp fol acute myocard infarct |
| Myocardial Infarction | 2491   | Coronary thrombosis  |
| Myocardial Infarction | 55401  | ECG: subendocardial infarct                                  |
| Myocardial Infarction | 9507   | Acute non-Q wave infarction                                  |
| Myocardial Infarction | 30421  | Cardiac rupture following myocardial infarction (MI)         |
| Myocardial Infarction | 241    | Acute myocardial infarction                                  |
| Myocardial Infarction | 30330  | Acute Q-wave infarct   |
| Myocardial Infarction | 17133  | Mural thrombosis   |
| Myocardial Infarction | 62626  | Acute papillary muscle infarction                            |
| Myocardial Infarction | 12139  | Acute anterolateral infarction                               |
| Myocardial Infarction | 15661  | Dressler's syndrome  |
| Myocardial Infarction | 23708  | Atrial septal defect/curr comp folow acut myocardal infarct  |
| Myocardial Infarction | 18842  | Subsequent myocardial infarction                             |
| Myocardial Infarction | 23892  | Posterior myocardial infarction NOS                          |
| Myocardial Infarction | 108437 | Very mild acute rejection of renal transplant                |
| Myocardial Infarction | 28736  | Acute atrial infarction                                      |
| Myocardial Infarction | 32272  | Postoperative myocardial infarction                          |
| Myocardial Infarction | 45809  | Subsequent myocardial infarction of anterior wall            |
| Myocardial Infarction | 5387   | Other specified anterior myocardial infarction               |

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| Myocardial Infarction | 59940  | Ruptur chordae tendinae/curr comp fol acute myocard infarct  |
| Myocardial Infarction | 72562  | Subsequent myocardial infarction of other sites              |
| Myocardial Infarction | 68748  | Postoperative myocardial infarction, unspecified             |
| Myocardial Infarction | 100139 | History of myocardial infarction                             |
| Myocardial Infarction | 99991  | [X]Subsequent myocardial infarction of unspecified site      |
| Myocardial Infarction | 29643  | Acute inferoposterior infarction                             |
| Myocardial Infarction | 46276  | Postoperative transmural myocardial infarction inferior wall |
| Myocardial Infarction | 14897  | Anterior myocardial infarction NOS                           |
| Myocardial Infarction | 32854  | Acute posterolateral myocardial infarction                   |
| Myocardial Infarction | 46112  | Postoperative transmural myocardial infarction anterior wall |
| Myocardial Infarction | 39904  | ECG: old myocardial infarction                               |
| Myocardial Infarction | 38609  | Subsequent myocardial infarction of inferior wall            |
| Myocardial Infarction | 106812 | Postoperative transmural myocardial infarction unspec site   |
| Myocardial Infarction | 36423  | Certain current complication follow acute myocardial infarct |
| Myocardial Infarction | 1204   | Heart attack   |
|                       |        | Thrombosis atrium,auric append&vent/curr comp foll acute     |
| Myocardial Infarction | 29553  | MI   |
| Myocardial Infarction | 50372  | H/O: Myocardial infarction in last year                      |
| Myocardial Infarction | 29758  | Acute transmural myocardial infarction of unspecif site      |
| Myocardial Infarction | 46166  | Subsequent myocardial infarction of unspecified site         |
| Myocardial Infarction | 12541  | [V]Observation for suspected myocardial infarction           |
| Myocardial Infarction | 14658  | Acute myocardial infarction NOS                              |
| Myocardial Infarction | 10562  | Acute non-ST segment elevation myocardial infarction         |
| Myocardial Infarction | 16408  | Healed myocardial infarction                                 |
| Myocardial Infarction | 37657  | Ventric septal defect/curr comp fol acut myocardal infarctn  |
| Myocardial Infarction | 63467  | True posterior myocardial infarction                         |
| Myocardial Infarction | 13566  | Attack - heart   |
| Myocardial Infarction | 46017  | Other acute myocardial infarction NOS                        |
| Myocardial Infarction | 9555   | Post infarct angina  |
| Myocardial Infarction | 109035 | [X]Subsequent myocardial infarction of other sites           |
| Myocardial Infarction | 35119  | Post infarction pericarditis                                 |
| Myocardial Infarction | 17689  | Silent myocardial infarction                                 |
| Myocardial Infarction | 41221  | Acute septal infarction                                      |
| Myocardial Infarction | 23579  | Postmyocardial infarction syndrome                           |
| Myocardial Infarction | 68357  | Microinfarction of heart                                     |
| Myocardial Infarction | 40429  | Acute anteroapical infarction                                |
| Myocardial Infarction | 3704   | Acute subendocardial infarction                              |
| Myocardial Infarction | 41835  | Postoperative subendocardial myocardial infarction           |
| Myocardial Infarction | 35674  | H/O: myocardial infarct <60                                  |
| Myocardial Infarction | 61670  | Diab mellit insulin-glucose infus acute myocardial infarct   |
| Myocardial Infarction | 8935   | Acute inferolateral infarction                               |
| Myocardial Infarction | 14898  | Lateral myocardial infarction NOS                            |
| Myocardial Infarction | 59032  | ECG: myocardial infarct NOS                                  |
| Myocardial Infarction | 34803  | Other acute myocardial infarction                            |
| Myocardial Infarction | 40399  | H/O: myocardial infarct >60                                  |

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| Myocardial Infarction | 12229  | Acute ST segment elevation myocardial infarction            |
| Myocardial Infarction | 4017   | Old myocardial infarction                                   |
| Myocardial Infarction | 13571  | Thrombosis - coronary                                       |
| Myocardial Infarction | 96838  | [X]Acute transmural myocardial infarction of unspecif site  |
| Myocardial Infarction | 17872  | Acute anteroseptal infarction                               |
| Myocardial Infarction | 1677   | MI - acute myocardial infarction                            |
| Peripheral Neuropathy | 36643  | Neuropathic arthritis                                       |
| Peripheral Neuropathy | 31551  | Inflammatory polyneuropathy, unspecified                    |
| Peripheral Neuropathy | 2790   | Peripheral neuropathy                                       |
| Peripheral Neuropathy | 50527  | Type II diabetes mellitus with polyneuropathy               |
| Peripheral Neuropathy | 14884  | Other idiopathic peripheral neuropathy                      |
| Peripheral Neuropathy | 19454  | Polyneuropathy in uraemia                                   |
| Peripheral Neuropathy | 41652  | Other toxic or inflammatory neuropathy                      |
| Peripheral Neuropathy | 2342   | Diabetic neuropathy   |
| Peripheral Neuropathy | 91741  | [X]Other specified mononeuropathies                         |
| Peripheral Neuropathy | 73337  | Polyneuropathy in beriberi                                  |
| Peripheral Neuropathy | 11544  | Neuropathic pain  |
| Peripheral Neuropathy | 31790  | Polyneuropathy in diabetes                                  |
| Peripheral Neuropathy | 18230  | Type 1 diabetes mellitus with neuropathic arthropathy       |
| Peripheral Neuropathy | 39692  | Polyneuropathy in herpes zoster                             |
| Peripheral Neuropathy | 101311 | Insulin dependent diabetes mellitus with polyneuropathy     |
| Peripheral Neuropathy | 6908   | Other idiopathic peripheral neuropathy NOS                  |
| Peripheral Neuropathy | 68105  | Type 1 diabetes mellitus with mononeuropathy                |
| Peripheral Neuropathy | 31097  | Uninhibited neuropathic bladder, NEC                        |
| Peripheral Neuropathy | 18075  | Hereditary and idiopathic peripheral neuropathy             |
| Peripheral Neuropathy | 45081  | Toxic neuropathy  |
| Peripheral Neuropathy | 44512  | Idiopathic progressive polyneuropathy                       |
| Peripheral Neuropathy | 35785  | Chronic painful diabetic neuropathy                         |
| Peripheral Neuropathy | 113975 | Type I diabetes mellitus with polyneuropathy                |
| Peripheral Neuropathy | 24355  | Polyneuropathy in vitamin B deficiency                      |
| Peripheral Neuropathy | 105825 | Familial amyloid polyneuropathy type III                    |
| Peripheral Neuropathy | 45467  | Non-insulin dependent diabetes mellitus with polyneuropathy |
| Peripheral Neuropathy | 18534  | Ulnar neuropathy  |
| Peripheral Neuropathy | 37759  | Neuropathic spondylopathy                                   |
| Peripheral Neuropathy | 46301  | Type 1 diabetes mellitus with polyneuropathy                |
| Peripheral Neuropathy | 93868  | [X]Other mononeuropathies of upper limb                     |
| Peripheral Neuropathy | 30668  | Autonomic neuropathy due to amyloid                         |
| Peripheral Neuropathy | 11162  | Reflex neuropathic bladder, not elsewhere classified        |
| Peripheral Neuropathy | 49575  | Neuropathic arthropathy                                     |
| Peripheral Neuropathy | 50813  | Type II diabetes mellitus with mononeuropathy               |
| Peripheral Neuropathy | 24694  | Insulin dependent diabetes mellitus with mononeuropathy     |
| Peripheral Neuropathy | 48078  | Acute painful diabetic neuropathy                           |
| Peripheral Neuropathy | 114691 | [X]Polyneuropathy in neoplastic disease CE                  |
| Peripheral Neuropathy | 30537  | Polyneuropathy in malignant disease                         |
| Peripheral Neuropathy | 109760 | Diabetic peripheral neuropathic pain                        |

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| Peripheral Neuropathy | 40962  | Non-insulin dependent d m with neuropathic arthropathy  |
| Peripheral Neuropathy | 3958   | Polyneuropathy  |
| Peripheral Neuropathy | 31709  | Posttherpetic polyneuropathy  |
| Peripheral Neuropathy | 100064 | Polyneuropathy in mumps   |
| Peripheral Neuropathy | 14883  | Hereditary or idiopathic peripheral neuropathy NOS  |
| Peripheral Neuropathy | 17067  | Autonomic neuropathy due to diabetes  |
| Peripheral Neuropathy | 6055   | Ischaemic optic neuropathy  |
| Peripheral Neuropathy | 109197 | Type II diabetes mellitus with neuropathic arthropathy  |
| Peripheral Neuropathy | 91943  | Type I diabetes mellitus with polyneuropathy  |
| Peripheral Neuropathy | 2925   | Alcoholic polyneuropathy  |
| Peripheral Neuropathy | 58758  | Polyneuropathy in porphyria   |
| Peripheral Neuropathy | 47465  | Polyneuropathy in polyarteritis nodosa  |
| Peripheral Neuropathy | 24121  | Intercostal neuropathy  |
| Peripheral Neuropathy | 62674  | Type 2 diabetes mellitus with mononeuropathy  |
| Peripheral Neuropathy | 22373  | Toxic optic neuropathy  |
| Peripheral Neuropathy | 62401  | Polyneuropathy in rheumatoid arthritis  |
| Peripheral Neuropathy | 99855  | Neuropathic foot ulcer  |
| Peripheral Neuropathy | 41716  | Insulin dependent diabetes mellitus with polyneuropathy   |
| Peripheral Neuropathy | 107322 | [X]Other mononeuropathies in diseases classified elsewhere  |
| Peripheral Neuropathy | 60208  | Type I diabetes mellitus with neuropathic arthropathy   |
| Peripheral Neuropathy | 28333  | Familial neuropathic amyloid  |
| Peripheral Neuropathy | 18492  | Neuropathic foot blister  |
| Peripheral Neuropathy | 57313  | Polyneuropathy in collagen vascular disease   |
| Peripheral Neuropathy | 52089  | Polyneuropathy in diphtheria  |
| Peripheral Neuropathy | 47816  | Type II diabetes mellitus with neuropathic arthropathy  |
| Peripheral Neuropathy | 99231  | Type I diabetes mellitus with mononeuropathy  |
| Peripheral Neuropathy | 35385  | Type 2 diabetes mellitus with neuropathic arthropathy   |
| Peripheral Neuropathy | 5002   | Diabetic polyneuropathy   |
| Peripheral Neuropathy | 7795   | Diabetes mellitus with neuropathy   |
| Peripheral Neuropathy | 37315  | Diabetic mononeuropathy   |
| Peripheral Neuropathy | 44095  | Polyneuropathy in disseminated lupus erythematosus  |
| Peripheral Neuropathy | 15481  | Toxic or inflammatory neuropathy NOS  |
| Peripheral Neuropathy | 16368  | Idiopathic peripheral autonomic neuropathy  |
| Peripheral Neuropathy | 39858  | [X]Inflammatory polyneuropathy, unspecified   |
| Peripheral Neuropathy | 110567 | [X]Polyneuropathy/other musculoskeletal disorders CE  |
| Peripheral Neuropathy | 97306  | [X]Other specified polyneuropathies   |
| Peripheral Neuropathy | 54008  | Type 1 diabetes mellitus with neuropathic arthropathy   |
| Peripheral Neuropathy | 50099  | Peripheral autonomic neuropathy due to disease NOS  |
| Peripheral Neuropathy | 110363 | [X]Polyneuropathy/other endocrine+metabolic diseases CE<br>Non-insulin dependent diabetes mellitus with |
| Peripheral Neuropathy | 72320  | mononeuropathy  |
| Peripheral Neuropathy | 37444  | Neuropathic bladder   |
| Peripheral Neuropathy | 10722  | Inflammatory and toxic neuropathy   |
| Peripheral Neuropathy | 72889  | [X]Autonomic neuropathy/endocrine+metabolic diseases CE   |
| Peripheral Neuropathy | 16491  | Diabetes mellitus with polyneuropathy   |

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| Peripheral Neuropathy       | 39809  | Insulin dependent diab mell with neuropathic arthropathy   |
| Peripheral Neuropathy       | 93228  | [X]Paraneoplastic neuromyopathy and neuropathy   |
| Peripheral Neuropathy       | 24285  | Nutritional optic neuropathy   |
| Peripheral Neuropathy       | 96256  | Axonal sensorimotor neuropathy   |
| Peripheral Neuropathy       | 68960  | Polyneuropathy in hypoglycaemia  |
| Peripheral Neuropathy       | 8591   | Peripheral neuropathy - hereditary or idiopathic   |
| Peripheral Neuropathy       | 71258  | Polyneuropathy in collagen vascular disease NOS  |
| Peripheral Neuropathy       | 24571  | Asymptomatic diabetic neuropathy   |
| Peripheral Neuropathy       | 24226  | Polyneuropathy unspecified   |
| Peripheral Neuropathy       | 54124  | Other toxic agent polyneuropathy   |
| Peripheral Neuropathy       | 47409  | Type II diabetes mellitus with polyneuropathy  |
| Peripheral Neuropathy       | 24222  | Polyneuropathy due to drugs  |
| Peripheral Neuropathy       | 66965  | Type 2 diabetes mellitus with neuropathic arthropathy  |
| Peripheral Neuropathy       | 40751  | Polyneuropathy in sarcoidosis  |
| Peripheral Neuropathy       | 49664  | Idiopathic peripheral autonomic neuropathy NOS   |
| Peripheral Neuropathy       | 66336  | Polyneuropathy in amyloidosis  |
| Peripheral Neuropathy       | 56272  | Polyneuropathy in disease EC   |
| Peripheral Neuropathy       | 109865 | Type 2 diabetes mellitus with polyneuropathy   |
| Peripheral Neuropathy       | 97449  | [X]Other hereditary and idiopathic neuropathies  |
| Peripheral Neuropathy       | 97479  | [X]Other inflammatory polyneuropathies   |
| Peripheral Neuropathy       | 11663  | Neuropathic diabetic ulcer - foot  |
| Peripheral Neuropathy       | 72922  | [X]Other mononeuropathies of lower limb  |
| Peripheral Neuropathy       | 29881  | Neuropathic bladder  |
| Peripheral Neuropathy       | 33257  | Peripheral autonomic neuropathy disease EC   |
| Peripheral Neuropathy       | 63555  | Polyneuropathy in disease NOS  |
| Peripheral Neuropathy       | 18425  | Type 2 diabetes mellitus with polyneuropathy   |
| Peripheral Neuropathy       | 35537  | [X] Polyneuropathy, unspecified  |
| Peripheral Neuropathy       | 95351  | Type II diabetes mellitus with mononeuropathy  |
| Peripheral Neuropathy       | 55076  | [X]Polyneuropathies & other disord of peripheral nerv syst   |
| Peripheral Neuropathy       | 97848  | Mumps polyneuropathy   |
| Peripheral Neuropathy       | 69047  | Serum neuropathy   |
| Peripheral Vascular Disease | 66761  | Replacement of aneurysmal bifurcation of aorta NOS   |
| Peripheral Vascular Disease | 54071  | Revision of reconstruction involving aorta   |
| Peripheral Vascular Disease | 39437  | Open embolectomy popliteal artery  |
| Peripheral Vascular Disease | 11430  | Thoracoabdominal aortic aneurysm, ruptured<br>Emerg bypass femoral artery by fem/fem art anastomosis |
| Peripheral Vascular Disease | 48939  | NEC  |
| Peripheral Vascular Disease | 3778   | Aorto biiliac graft  |
| Peripheral Vascular Disease | 6308   | Ischaemic leg ulcer  |
| Peripheral Vascular Disease | 38546  | Dacron graft operations on aorta   |
| Peripheral Vascular Disease | 47835  | Profundoplasty of femoral artery NEC   |
| Peripheral Vascular Disease | 70446  | Endovascular stenting infrarenal abdominal aortic aneurysm   |
| Peripheral Vascular Disease | 40302  | Axillo-unifemoral PTFE bypass graft  |
| Peripheral Vascular Disease | 42645  | Open thrombectomy of popliteal artery  |
| Peripheral Vascular Disease | 52695  | Endarterectomy and patch repair of popliteal artery  |

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| Peripheral Vascular Disease | 28777 | Endarterectomy and patch repair of femoral artery            |
| Peripheral Vascular Disease | 39877 | Bypass femoral artery by fem/tib art anast c prosthesis NEC  |
| Peripheral Vascular Disease | 48700 | Bypass popliteal artery by pop/tib a anast c vein graft NEC  |
| Peripheral Vascular Disease | 6256  | Percutaneous transluminal embolectomy of femoral artery      |
| Peripheral Vascular Disease | 5943  | Other peripheral vascular disease                            |
| Peripheral Vascular Disease | 16363 | Open thrombectomy of femoral artery                          |
| Peripheral Vascular Disease | 6356  | Percutaneous transluminal angioplasty of femoral artery      |
| Peripheral Vascular Disease | 96255 | Emerg bypass femoral art by fem/tib a anast c vein graft NEC |
| Peripheral Vascular Disease | 71041 | Percutaneous transluminal embolisation of femoral artery     |
| Peripheral Vascular Disease | 14797 | Extremity artery atheroma                                    |
| Peripheral Vascular Disease | 1517  | Intermittent claudication                                    |
| Peripheral Vascular Disease | 28616 | Bypass iliac artery by iliac/femoral artery anastomosis NEC  |
| Peripheral Vascular Disease | 66879 | Emerg bypass pop art by pop/tib art anast c vein graft NEC   |
| Peripheral Vascular Disease | 52869 | Reconstruction of femoral artery with vein graft             |
| Peripheral Vascular Disease | 34153 | Axillo-bifemoral bypass graft                                |
| Peripheral Vascular Disease | 95976 | Endovascular stenting of aorto-uniiliac aneurysm             |
| Peripheral Vascular Disease | 12736 | Type 2 diabetes mellitus with gangrene                       |
| Peripheral Vascular Disease | 72448 | Emerg bypass iliac artery by femoral/femoral art anast NEC   |
| Peripheral Vascular Disease | 28166 | Dacron aortofemoral Y graft                                  |
| Peripheral Vascular Disease | 96699 | Emerg replace aneurysm iliac art by iliac/femoral art anast  |
| Peripheral Vascular Disease | 6617  | Reconstruction of femoral or popliteal artery NOS            |
| Peripheral Vascular Disease | 67818 | Emerg bypass popliteal art by pop/pop art anast c prosth NEC |
| Peripheral Vascular Disease | 55394 | Emerg replace aneurysm pop artery by pop/fem art anastomosis |
| Peripheral Vascular Disease | 89470 | Emerg replace aneurysm pop art by pop/tib anast c vein graft |
| Peripheral Vascular Disease | 97217 | Endovascu insert stent infrarenal abdominal aortic aneurysm  |
| Peripheral Vascular Disease | 39776 | Other emergency bypass of popliteal artery                   |
| Peripheral Vascular Disease | 28894 | Other specified transluminal operation on iliac artery       |
| Peripheral Vascular Disease | 64555 | Bypass popliteal artery by pop/pop a anast c prosthesis NEC  |
| Peripheral Vascular Disease | 62301 | Replacement of aneurysmal bifurcation of aorta OS            |
| Peripheral Vascular Disease | 66930 | Percutaneous transluminal embolectomy of iliac artery        |
| Peripheral Vascular Disease | 6827  | Peripheral ischaemia   |
| Peripheral Vascular Disease | 44439 | Other replacement of aneurysmal popliteal artery             |
| Peripheral Vascular Disease | 63396 | Reconstruction of femoral artery                             |
| Peripheral Vascular Disease | 24327 | Ischaemic ulcer diabetic foot                                |
| Peripheral Vascular Disease | 96654 | Emerg repl aneurysm bifurc aorta by anast aorta to fem art   |
| Peripheral Vascular Disease | 21927 | Other bypass of iliac artery                                 |
| Peripheral Vascular Disease | 68320 | Other emergency bypass of femoral or popliteal artery NOS    |
| Peripheral Vascular Disease | 17220 | Emergency repair of aortic aneurysm                          |
| Peripheral Vascular Disease | 97109 | Endovascular stenting for aorto-uniiliac aneurysm            |
| Peripheral Vascular Disease | 15302 | Peripheral arterial embolism and thrombosis NOS              |
| Peripheral Vascular Disease | 54899 | Type II diabetes mellitus with peripheral angiopathy         |
| Peripheral Vascular Disease | 66869 | Repair of popliteal artery with temporary silastic shunt     |
| Peripheral Vascular Disease | 6853  | Claudication   |
| Peripheral Vascular Disease | 3530  | Peripheral vascular disease NOS                              |

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| Peripheral Vascular Disease | 44430 | Endarterectomy of common iliac artery NEC                     |
| Peripheral Vascular Disease | 93959 | Transluminal operations on aneurysmal segment of aorta        |
| Peripheral Vascular Disease | 98174 | Ischaemic foot  |
| Peripheral Vascular Disease | 1826  | Ischaemia of legs   |
| Peripheral Vascular Disease | 16034 | Aortic aneurysm without mention of rupture NOS                |
| Peripheral Vascular Disease | 41583 | Transluminal operation on femoral or popliteal artery OS      |
| Peripheral Vascular Disease | 20657 | Revision of reconstruction of artery                          |
| Peripheral Vascular Disease | 28125 | Reconstruction of popliteal artery                            |
| Peripheral Vascular Disease | 17767 | Abdominal aortic aneurysm which has ruptured                  |
| Peripheral Vascular Disease | 6872  | Aortic aneurysm NOS   |
| Peripheral Vascular Disease | 40401 | Non-insulin dependent diabetes mellitus with gangrene         |
| Peripheral Vascular Disease | 69519 | Reconstruction of popliteal artery with vein graft            |
| Peripheral Vascular Disease | 17336 | Open femoral embolectomy                                      |
| Peripheral Vascular Disease | 49319 | Other open operations on superficial femoral artery           |
| Peripheral Vascular Disease | 24692 | Other bypass of femoral artery or popliteal artery            |
| Peripheral Vascular Disease | 64446 | Insulin dependent diab mell with peripheral angiopathy        |
| Peripheral Vascular Disease | 16260 | Extremity artery atheroma NOS                                 |
| Peripheral Vascular Disease | 97661 | Replace aneurysm fem artery by fem/fem art anastomosis<br>NEC |
| Peripheral Vascular Disease | 18060 | Other bypass of femoral artery                                |
| Peripheral Vascular Disease | 20892 | Other open operations on popliteal artery                     |
| Peripheral Vascular Disease | 12331 | Other bypass of popliteal artery                              |
| Peripheral Vascular Disease | 60212 | Other open operations on common femoral artery                |
| Peripheral Vascular Disease | 41823 | Bypass femoral artery by fem/tib art anast c vein graft NEC   |
| Peripheral Vascular Disease | 15304 | Ruptured aortic aneurysm NOS                                  |
| Peripheral Vascular Disease | 94556 | Other replacement of aneurysmal femoral/popliteal artery OS   |
| Peripheral Vascular Disease | 65669 | Profundoplasty of popliteal artery NEC                        |
| Peripheral Vascular Disease | 35399 | Diabetes mellitus with peripheral circulatory disorder        |
| Peripheral Vascular Disease | 32492 | Bypass common iliac artery by aorta/com iliac art anast NEC   |
| Peripheral Vascular Disease | 36952 | Other bypass of bifurcation of aorta                          |
| Peripheral Vascular Disease | 34037 | Open insertion of iliac artery stent                          |
| Peripheral Vascular Disease | 55877 | Transluminal operation on iliac artery NOS                    |
| Peripheral Vascular Disease | 32556 | Diabetes with gangrene  |
| Peripheral Vascular Disease | 27580 | Bypass femoral artery by fem/pop art anast c prosthesis NEC   |
| Peripheral Vascular Disease | 15532 | Bypass bifurcation aorta by anastom aorta to iliac artery     |
| Peripheral Vascular Disease | 90549 | Endovascular stenting of aortic bifurcation NEC               |
| Peripheral Vascular Disease | 45474 | Emergency replacement of aneurysmal segment of aorta NOS      |
| Peripheral Vascular Disease | 69124 | IDDM with peripheral circulatory disorder                     |
| Peripheral Vascular Disease | 56510 | Replace aneurysm bifurc aorta by anast aorta to iliac artery  |
| Peripheral Vascular Disease | 16993 | H/O: aortic aneurysm  |
| Peripheral Vascular Disease | 40397 | Other open operations on femoral artery or popliteal artery   |
| Peripheral Vascular Disease | 30989 | Femoro-femoral prosthetic cross over graft                    |
| Peripheral Vascular Disease | 53580 | Other open operations on common iliac artery                  |
| Peripheral Vascular Disease | 60699 | Type 2 diabetes mellitus with peripheral angiopathy           |
| Peripheral Vascular Disease | 63408 | Tube graft abdominal Aortic aneurysm (emergency)              |



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| Peripheral Vascular Disease | 96656 | Other replacement of aneurysmal femoral/popliteal artery NOS  |
| Peripheral Vascular Disease | 23871 | Peripheral angiopathic disease EC NOS   |
| Peripheral Vascular Disease | 45477 | Emergency replacement of aneurysmal segment of aorta OS   |
| Peripheral Vascular Disease | 52289 | Percutaneous transluminal embolectomy of popliteal artery   |
| Peripheral Vascular Disease | 55445 | Other replacement of aneurysmal segment of aorta OS<br>Replace aneurysm fem art by fem/pop art anastom c prosth |
| Peripheral Vascular Disease | 96472 | NEC   |
| Peripheral Vascular Disease | 61256 | Repair of iliac artery NEC  |
| Peripheral Vascular Disease | 18038 | Revision of reconstruction involving femoral artery   |
| Peripheral Vascular Disease | 62775 | Emerg bypass pop art by pop/peron art anast c vein graft NEC  |
| Peripheral Vascular Disease | 51720 | Transluminal procedure on superficial femoral artery  |
| Peripheral Vascular Disease | 24677 | Other open operation on femoral or popliteal artery OS  |
| Peripheral Vascular Disease | 2066  | Other bypass of femoral artery or popliteal artery NOS  |
| Peripheral Vascular Disease | 68412 | Bypass popliteal art by pop/peron art anast c vein graft NEC  |
| Peripheral Vascular Disease | 7111  | Insertion of iliac artery stent   |
| Peripheral Vascular Disease | 56803 | NIDDM with peripheral circulatory disorder  |
| Peripheral Vascular Disease | 62107 | Type II diabetes mellitus with gangrene   |
| Peripheral Vascular Disease | 31822 | Other emergency bypass of segment of aorta<br>Emerg bypass femoral art by fem/pop a anast c vein graft          |
| Peripheral Vascular Disease | 52342 | NEC   |
| Peripheral Vascular Disease | 37806 | Type 2 diabetes mellitus with peripheral angiopathy   |
| Peripheral Vascular Disease | 2760  | Peripheral vascular disease NOS   |
| Peripheral Vascular Disease | 40732 | Other bypass of superficial femoral artery  |
| Peripheral Vascular Disease | 36136 | Endarterectomy of popliteal artery NEC  |
| Peripheral Vascular Disease | 1736  | Aortic aneurysm repair  |
| Peripheral Vascular Disease | 63711 | Transluminal operation on femoral or popliteal artery NOS   |
| Peripheral Vascular Disease | 46125 | Emergency replacement of aneurysmal popliteal artery  |
| Peripheral Vascular Disease | 42115 | Bypass popliteal artery by pop/fem artery anastomosis NEC   |
| Peripheral Vascular Disease | 33430 | Operation on aneurysm of aorta NEC  |
| Peripheral Vascular Disease | 69993 | Type 1 diabetes mellitus with gangrene  |
| Peripheral Vascular Disease | 55870 | Abdominal aortogram abnormal  |
| Peripheral Vascular Disease | 49273 | Revision of reconstruction involving iliac artery   |
| Peripheral Vascular Disease | 94069 | Endovas insertion of stent graft for aortic bifurcation NEC   |
| Peripheral Vascular Disease | 32403 | Diabetes mellitus with gangrene   |
| Peripheral Vascular Disease | 26232 | Tube graft of Abdominal aortic aneurysm   |
| Peripheral Vascular Disease | 56495 | Replace aneurysm bifurc aorta by anast aorta to femoral art   |
| Peripheral Vascular Disease | 4325  | Other specified peripheral vascular disease NOS   |
| Peripheral Vascular Disease | 31338 | Reconstruction of femoral artery or popliteal artery  |
| Peripheral Vascular Disease | 43648 | Emergency femoro-femoral prosthetic cross over graft  |
| Peripheral Vascular Disease | 36443 | Bypass iliac artery by femoral/femoral art anastomosis NEC  |
| Peripheral Vascular Disease | 37787 | Other bypass of common femoral artery   |
| Peripheral Vascular Disease | 24097 | Bypass popliteal artery by pop/pop a anast c vein graft NEC   |
| Peripheral Vascular Disease | 33807 | Diabetes mellitus, adult with gangrene  |
| Peripheral Vascular Disease | 43651 | Emerg bypass femoral art by fem/pop art anast c prosth NEC  |
| Peripheral Vascular Disease | 59534 | H/O: Peripheral vascular disease procedure  |

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| Peripheral Vascular Disease | 72491 | Other emerg bypass femoral or popliteal art by anastomosis  |
| Peripheral Vascular Disease | 66820 | Emerg bypass femoral art by fem/tib art anast c prosth NEC  |
| Peripheral Vascular Disease | 13572 | Ruptured abdominal aortic aneurysm<br>Replace aneurysm pop art by pop/pop a anast c vein graft                          |
| Peripheral Vascular Disease | 71141 | NEC   |
| Peripheral Vascular Disease | 60499 | Insulin dependent diabetes mellitus with gangrene   |
| Peripheral Vascular Disease | 67982 | Bypass femoral artery by fem/peron a anast c prosthesis NEC<br>Replace aneurysm abdominal aorta by anast aorta to aorta |
| Peripheral Vascular Disease | 19996 | NEC   |
| Peripheral Vascular Disease | 28119 | Repair of popliteal artery NEC  |
| Peripheral Vascular Disease | 9561  | Ischaemic toe   |
| Peripheral Vascular Disease | 68385 | Other replacement aneurysmal femoral artery by anastomosis<br>Emergency replacement of aneurysmal femoral/popliteal     |
| Peripheral Vascular Disease | 61666 | artery  |
| Peripheral Vascular Disease | 90861 | Transluminal operations on aneurysmal segment of aorta NOS  |
| Peripheral Vascular Disease | 24229 | Percutaneous transluminal insertion of iliac artery stent   |
| Peripheral Vascular Disease | 51124 | Ligation of aneurysm of popliteal artery  |
| Peripheral Vascular Disease | 52358 | Replacement of aneurysmal bifurcation of aorta  |
| Peripheral Vascular Disease | 52473 | Transluminal procedure on popliteal artery  |
| Peripheral Vascular Disease | 50894 | Other specified reconstruction of iliac artery  |
| Peripheral Vascular Disease | 11766 | Other emergency bypass of femoral artery  |
| Peripheral Vascular Disease | 67083 | Reconstruction of femoral or popliteal artery OS  |
| Peripheral Vascular Disease | 48846 | Operation on popliteal artery NEC   |
| Peripheral Vascular Disease | 44097 | Transluminal operations on iliac artery   |
| Peripheral Vascular Disease | 36651 | Other replacement of aneurysmal segment of aorta NOS  |
| Peripheral Vascular Disease | 63280 | Reconstruction of common iliac artery   |
| Peripheral Vascular Disease | 51331 | Other open operations on iliac artery   |
| Peripheral Vascular Disease | 42640 | Other bypass of femoral artery or popliteal artery OS   |
| Peripheral Vascular Disease | 14895 | Aorto bifemoral graft   |
| Peripheral Vascular Disease | 1735  | Aortic aneurysm   |
| Peripheral Vascular Disease | 43108 | Other replacement of aneurysmal segment of aorta  |
| Peripheral Vascular Disease | 1867  | Abdominal aortic aneurysm without mention of rupture  |
| Peripheral Vascular Disease | 98175 | Endovascular insertion of stent for aorto-uniiliac aneurysm   |
| Peripheral Vascular Disease | 98565 | OS translum ins stent graft for aneurysmal segment of aorta<br>Replace aneurysm popliteal artery by pop/fem anastomosis |
| Peripheral Vascular Disease | 95416 | NEC   |
| Peripheral Vascular Disease | 69922 | Emerg repl aneurysm bifurc aorta by anast aorta to iliac a  |
| Peripheral Vascular Disease | 31053 | [D]Widespread diabetic foot gangrene  |
| Peripheral Vascular Disease | 64798 | Other bypass of bifurcation of aorta NOS  |
| Peripheral Vascular Disease | 51211 | Endarterectomy of iliac artery NEC  |
| Peripheral Vascular Disease | 10827 | Percutaneous transluminal angioplasty of iliac artery   |
| Peripheral Vascular Disease | 63238 | Other emergency bypass of deep femoral artery   |
| Peripheral Vascular Disease | 62025 | Emerg replace aneurysm fem art by fem/pop anast c vein graft  |
| Peripheral Vascular Disease | 96809 | Reconstruction of superficial femoral artery<br>Emerg replace aneurysm abdom aorta by anast aorta/aorta                 |
| Peripheral Vascular Disease | 54192 | NEC   |

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| Peripheral Vascular Disease | 57822 | Other open operation on iliac artery NOS                     |
| Peripheral Vascular Disease | 51166 | Y graft abdominal Aortic aneurysm                            |
| Peripheral Vascular Disease | 28840 | Operation on aneurysm of femoral artery NEC                  |
| Peripheral Vascular Disease | 61974 | Other bypass of femoral or popliteal artery by anastomosis   |
| Peripheral Vascular Disease | 55324 | Other specified other open operation on iliac artery         |
| Peripheral Vascular Disease | 17347 | Leg artery operations  |
| Peripheral Vascular Disease | 44553 | Replace aneurys infrarenal aorta by anast aorta to aorta NEC |
| Peripheral Vascular Disease | 45521 | Juxtarenal aortic aneurysm                                   |
| Peripheral Vascular Disease | 55554 | Bypass leg artery by aorta/com femoral art anastomosis NEC   |
| Peripheral Vascular Disease | 58092 | Replace aneurysm pop art by pop/pop art anastom c prosth NEC |
| Peripheral Vascular Disease | 59602 | Iliac endarterectomy and patch                               |
| Peripheral Vascular Disease | 31613 | Emergency replacement of aneurysmal segment of aorta         |
| Peripheral Vascular Disease | 45428 | Bypass femoral artery by femoral/femoral art anastomosis NEC |
| Peripheral Vascular Disease | 62866 | Reconstruction of iliac artery NOS                           |
| Peripheral Vascular Disease | 60693 | Emerg bypass pop art by pop/pop art anast c vein graft NEC   |
| Peripheral Vascular Disease | 65025 | Diabetes mellitus NOS with peripheral circulatory disorder   |
| Peripheral Vascular Disease | 63357 | Diabetes mellitus, adult, + peripheral circulatory disorder  |
| Peripheral Vascular Disease | 53634 | [D]Gangrene of toe in diabetic                               |
| Peripheral Vascular Disease | 53675 | Bypass femoral artery by fem/peron a anast c vein graft NEC  |
| Peripheral Vascular Disease | 55825 | Other specified other bypass of bifurcation of aorta         |
| Peripheral Vascular Disease | 94784 | Emergency replacement aneurysmal superficial femoral artery  |
| Peripheral Vascular Disease | 65286 | Revision of reconstruction of popliteal artery               |
| Peripheral Vascular Disease | 46465 | Transluminal operations on femoral or popliteal artery       |
| Peripheral Vascular Disease | 93627 | Translum ins stent graft for aneurysmal segment of aorta NOS |
| Peripheral Vascular Disease | 29112 | Percutaneous transluminal angioplasty of popliteal artery    |
| Peripheral Vascular Disease | 68141 | Emerg bypass comm iliac art by aorta/com iliac art anast NEC |
| Peripheral Vascular Disease | 92925 | Y graft of abdominal Aortic aneurysm (emergency)             |
| Peripheral Vascular Disease | 63368 | Repair of femoral artery with temporary silastic shunt       |
| Peripheral Vascular Disease | 17345 | AAA - Abdominal aortic aneurysm without mention of rupture   |
| Peripheral Vascular Disease | 16991 | Iliac and femoral artery operations                          |
| Peripheral Vascular Disease | 48755 | Emerg bypass bifurc aorta by anast aorta to femoral artery   |
| Peripheral Vascular Disease | 46168 | Other specified operations on iliac and femoral artery       |
| Peripheral Vascular Disease | 46150 | Type 2 diabetes mellitus with gangrene                       |
| Peripheral Vascular Disease | 94682 | Endovas insert of stent graft for suprarenal aortic aneurysm |
| Peripheral Vascular Disease | 33555 | Repair of femoral artery NEC                                 |
| Peripheral Vascular Disease | 52357 | Other specified other bypass of iliac artery                 |
| Peripheral Vascular Disease | 66437 | Repair of common iliac artery NEC                            |
| Peripheral Vascular Disease | 18816 | Endarterectomy of femoral artery NEC                         |
| Peripheral Vascular Disease | 95503 | Replacement of aneurysmal iliac artery NOS                   |
| Peripheral Vascular Disease | 2761  | Bypass bifurc aorta by anastom aorta to femoral artery NEC   |
| Peripheral Vascular Disease | 93468 | Type 1 diabetes mellitus with peripheral angiopathy          |
| Peripheral Vascular Disease | 66917 | Emerg bypass leg artery by aorta/com fem art anastomosis NEC |

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| Peripheral Vascular Disease | 23352  | Bypass aorta by anastomosis axillary to femoral artery NEC   |
| Peripheral Vascular Disease | 9099   | Other emergency bypass of femoral artery or popliteal artery |
| Peripheral Vascular Disease | 63920  | Ruptured suprarenal aortic aneurysm                          |
| Peripheral Vascular Disease | 59187  | Transluminal operations on common iliac artery               |
| Peripheral Vascular Disease | 97030  | Endovascular stenting of suprarenal aortic aneurysm          |
| Peripheral Vascular Disease | 40619  | Percutaneous transluminal embolisation of popliteal artery   |
| Peripheral Vascular Disease | 5702   | Peripheral ischaemic vascular disease                        |
| Peripheral Vascular Disease | 54212  | Non-insulin-dependent dm with peripheral angiopath           |
| Peripheral Vascular Disease | 44250  | Emerg bypass iliac art by iliac/femoral art anastomosis NEC  |
| Peripheral Vascular Disease | 95573  | Emerg aortic bypass by anastomosis axillary to femoral art   |
| Peripheral Vascular Disease | 19825  | Femoral arteriogram abnormal                                 |
| Peripheral Vascular Disease | 61255  | Open embolectomy of iliac artery                             |
| Peripheral Vascular Disease | 40787  | Thoracoabdominal aortic aneurysm, without mention of rupture |
| Peripheral Vascular Disease | 54379  | Replace aneurys suprarenal aorta by anast aorta to aorta NEC |
| Peripheral Vascular Disease | 41825  | Lower limb arteriogram abnorm.                               |
| Peripheral Vascular Disease | 39039  | Reconstruction of iliac artery                               |
| Peripheral Vascular Disease | 36065  | Endarterectomy and patch repair of common iliac artery       |
| Peripheral Vascular Disease | 70922  | Emerg bypass popliteal artery by pop/fem art anastomosis NEC |
| Peripheral Vascular Disease | 39749  | Operation on aneurysm of iliac artery NEC                    |
| Peripheral Vascular Disease | 81445  | Percutaneous transluminal insertion of stent femoral artery  |
| Peripheral Vascular Disease | 42465  | Dacron aortoiliac Y graft                                    |
| Peripheral Vascular Disease | 69346  | Other replacement of aneurysmal femoral artery               |
| Peripheral Vascular Disease | 66232  | Emerg replace aneurysm infrarenal aorta by anast aorta/aorta |
| Peripheral Vascular Disease | 34152  | Diabetic peripheral angiopathy                               |
| Peripheral Vascular Disease | 28030  | Bypass femoral artery by fem/pop art anast c vein graft NEC  |
| Peripheral Vascular Disease | 1318   | Aortic atherosclerosis                                       |
| Peripheral Vascular Disease | 55402  | Open embolectomy of bifurcation of aorta                     |
| Peripheral Vascular Disease | 101866 | Vascular claudication  |
| Peripheral Vascular Disease | 9119   | Open embolectomy of femoral artery                           |
| Peripheral Vascular Disease | 28651  | Iliac and femoral artery operations NOS                      |
| Peripheral Vascular Disease | 94331  | Translum insert stent graft for aneurysmal segment of aorta  |
| Peripheral Vascular Disease | 70448  | Diabetes mellitus, juvenile +peripheral circulatory disorder |
| Peripheral Vascular Disease | 60465  | Bypass popliteal artery by pop/tib a anast c prosthesis NEC  |
| Peripheral Vascular Disease | 38921  | Other bypass of iliac artery NOS                             |
| Peripheral Vascular Disease | 55476  | Emerg replace aneurysm fem art by fem/pop art anast c prosth |
| Peripheral Vascular Disease | 83577  | Endovas ins stent graft for infrarenal abdom aortic aneurysm |
| Peripheral Vascular Disease | 62818  | Endarterectomy and patch repair of iliac artery              |
| Peripheral Vascular Disease | 22016  | Femoro-femoral prosthetic cross over graft                   |
| Peripheral Vascular Disease | 73822  | Reconstruction of common femoral artery                      |
| Peripheral Vascular Disease | 97606  | Other emergency bypass of superficial femoral artery         |
| Peripheral Vascular Disease | 63605  | Profundoplasty and patch repair of popliteal artery          |
| Peripheral Vascular Disease | 9759   | Leaking abdominal aortic aneurysm                            |
| Peripheral Vascular Disease | 65692  | Other emergency bypass of femoral or popliteal artery OS     |
| Peripheral Vascular Disease | 52462  | Transluminal procedure on femoral artery                     |

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| Peripheral Vascular Disease | 59756  | Replacement of aneurysmal iliac artery                       |
| Peripheral Vascular Disease | 66804  | Bypass leg artery by aorta/deep femoral art anastomosis NEC  |
| Peripheral Vascular Disease | 73961  | [X]Other specified peripheral vascular diseases              |
| Peripheral Vascular Disease | 47538  | Other open operation on femoral or popliteal artery NOS      |
| Peripheral Vascular Disease | 57793  | Profundoplasty femoral artery & patch repair deep fem artery |
| Peripheral Vascular Disease | 38907  | Other specified peripheral vascular disease                  |
| Peripheral Vascular Disease | 47562  | Open embolectomy of common iliac artery                      |
| Peripheral Vascular Disease | 41768  | Ilio-femoral prosthetic cross over graft                     |
| Retinal Detachment          | 24347  | New partial retinal detachment with giant tear defect        |
| Retinal Detachment          | 47730  | Other forms of retinal detachment                            |
| Retinal Detachment          | 30514  | Traction retinal detachment                                  |
| Retinal Detachment          | 38463  | Retinal detachment with defect NOS                           |
| Retinal Detachment          | 38552  | Serous retinal detachment                                    |
| Retinal Detachment          | 62773  | New partial retinal detachment with multiple defects         |
| Retinal Detachment          | 32028  | Retinal detachment with retinal defect                       |
| Retinal Detachment          | 35250  | Other retinal detachments NOS                                |
| Retinal Detachment          | 1202   | Retinal detachment NOS                                       |
| Retinal Detachment          | 62901  | New partial retinal detachment with single defect            |
| Retinal Detachment          | 72901  | [X]Other retinal detachments                                 |
| Retinal Detachment          | 71651  | New partial retinal detachment with retinal dialysis         |
| Retinal Detachment          | 29800  | Unspecified retinal detachment with retinal defect           |
| Rheumatoid Arthritis        | 18155  | Rheumatoid bursitis  |
| Rheumatoid Arthritis        | 100914 | Rheumatoid arthritis of acromioclavicular joint              |
| Rheumatoid Arthritis        | 63198  | Rheumatoid arthritis of DIP joint of finger                  |
| Rheumatoid Arthritis        | 16480  | Rheumatoid arthritis screen                                  |
| Rheumatoid Arthritis        | 62401  | Polyneuropathy in rheumatoid arthritis                       |
| Rheumatoid Arthritis        | 37431  | Rheumatoid arthropathy + visceral/systemic involvement NOS   |
| Rheumatoid Arthritis        | 102088 | Delivery of rehabilitation for rheumatoid arthritis          |
| Rheumatoid Arthritis        | 46436  | Rheumatoid lung disease                                      |
| Rheumatoid Arthritis        | 44743  | Rheumatoid arthritis of cervical spine                       |
| Rheumatoid Arthritis        | 48832  | Rheumatoid arthritis of wrist                                |
| Rheumatoid Arthritis        | 51238  | Rheumatoid arthritis of 1st MTP joint                        |
| Rheumatoid Arthritis        | 14192  | Rheumatoid factor  |
| Rheumatoid Arthritis        | 9954   | Rheumatoid lung  |
| Rheumatoid Arthritis        | 844    | Rheumatoid arthritis   |
| Rheumatoid Arthritis        | 100187 | Disease activity score in rheumatoid arthritis               |
| Rheumatoid Arthritis        | 21358  | Rheumatoid arthritis of shoulder                             |
| Rheumatoid Arthritis        | 30548  | Rheumatoid vasculitis  |
| Rheumatoid Arthritis        | 31054  | Rheumatoid arthritis - multiple joint                        |
| Rheumatoid Arthritis        | 41941  | Rheumatoid arthritis of PIP joint of finger                  |
| Rheumatoid Arthritis        | 59738  | Rheumatoid arthritis of elbow                                |
| Rheumatoid Arthritis        | 107791 | Rheumatoid arthritis of tibio-fibular joint                  |
| Rheumatoid Arthritis        | 73619  | Rheumatoid arthritis of subtalar joint                       |
| Rheumatoid Arthritis        | 63365  | Rheumatoid arthritis of distal radio-ulnar joint             |

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| Rheumatoid Arthritis | 105507 | Rheumatoid arthritis annual review                           |
| Rheumatoid Arthritis | 14193  | Rheumatoid factor NOS  |
|                      |        | Other rheumatoid arthropathy + visceral/systemic involvement |
| Rheumatoid Arthritis | 49227  |  |
| Rheumatoid Arthritis | 44203  | Other rheumatoid arthritis of spine                          |
| Rheumatoid Arthritis | 9707   | Seropositive erosive rheumatoid arthritis                    |
| Rheumatoid Arthritis | 50863  | Rheumatoid arthritis of knee                                 |
| Rheumatoid Arthritis | 70658  | Rheumatoid arthritis of talonavicular joint                  |
| Rheumatoid Arthritis | 70221  | [X]Other specified rheumatoid arthritis                      |
| Rheumatoid Arthritis | 107112 | Rheumatoid arthritis of IP joint of toe                      |
| Rheumatoid Arthritis | 6916   | Seronegative rheumatoid arthritis                            |
| Rheumatoid Arthritis | 49067  | Rheumatoid arthritis of hip                                  |
| Rheumatoid Arthritis | 107963 | Rheumatoid arthritis of sternoclavicular joint               |
| Rheumatoid Arthritis | 27603  | Rheumatoid arthritis and other inflammatory polyarthropathy  |
| Rheumatoid Arthritis | 12019  | Seropositive rheumatoid arthritis, unspecified               |
| Rheumatoid Arthritis | 107340 | Rheumatoid arthritis monitoring invitation                   |
| Rheumatoid Arthritis | 31209  | Myopathy due to rheumatoid arthritis                         |
| Rheumatoid Arthritis | 100776 | Rheumatoid arthritis of sacro-iliac joint                    |
| Rheumatoid Arthritis | 28853  | Fibrosing alveolitis associated with rheumatoid arthritis    |
| Rheumatoid Arthritis | 5723   | Rheumatoid nodule  |
| Rheumatoid Arthritis | 107435 | Rheumatoid arthritis monitoring invitation first letter      |
| Rheumatoid Arthritis | 8350   | Flare of rheumatoid arthritis                                |
| Rheumatoid Arthritis | 6639   | H/O: rheumatoid arthritis                                    |
| Rheumatoid Arthritis | 107606 | Rheumatoid arthritis monitoring verbal invitation            |
| Rheumatoid Arthritis | 51239  | Rheumatoid arthritis of ankle                                |
| Rheumatoid Arthritis | 42299  | Rheumatoid arthritis of MCP joint                            |
| Rheumatoid Arthritis | 93715  | [X]Other seropositive rheumatoid arthritis                   |
| Rheumatoid Arthritis | 4502   | Rheumatoid factor positive                                   |
| Rheumatoid Arthritis | 99414  | Rheumatoid arthritis of lesser MTP joint                     |
| Rheumatoid Arthritis | 53621  | Rheumatoid nodule  |
| Rheumatoid Arthritis | 107676 | Rheumatoid arthritis monitoring invitation third letter      |
| Rheumatoid Arthritis | 17412  | Rheumatoid arthrit. monitoring                               |
| Rheumatoid Arthritis | 31724  | Rheumatoid lung  |
| Rheumatoid Arthritis | 56202  | [X]Seropositive rheumatoid arthritis, unspecified            |
| Rheumatoid Arthritis | 103829 | Disease activity score 28 joint in rheumatoid arthritis      |
| Rheumatoid Arthritis | 107575 | Rheumatoid arthritis monitoring invitation second letter     |
| Rheumatoid Arthritis | 107797 | Rheumatoid arthritis monitoring telephone invitation         |
| Rheumatoid Arthritis | 71784  | Rheumatoid arthritis of other tarsal joint                   |
| Shingles             | 516    | Shingles   |
| Shingles             | 50537  | Herpes zoster with other CNS complications                   |
| Shingles             | 1598   | Post-herpetic neuralgia                                      |
| Shingles             | 51692  | Encephalitis due to herpes zoster                            |
| Shingles             | 390    | Herpes zoster  |
| Shingles             | 43235  | Herpes zoster with other specified complication              |
| Shingles             | 31709  | Postherpetic polyneuropathy                                  |

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| Shingles                     | 7331   | Ramsay - Hunt syndrome                                       |
| Shingles                     | 52319  | Disseminated zoster  |
| Shingles                     | 31681  | Herpes zoster - otitis externa                               |
| Shingles                     | 21471  | Herpes zoster NOS  |
| Shingles                     | 27546  | Herpes zoster with keratoconjunctivitis                      |
| Shingles                     | 69405  | Herpes zoster encephalitis                                   |
| Shingles                     | 10223  | Postherpetic neuralgia                                       |
| Shingles                     | 55940  | Herpes zoster iridocyclitis                                  |
| Shingles                     | 57895  | Herpes zoster meningitis                                     |
| Shingles                     | 33810  | Herpes zoster with other ophthalmic complication             |
| Shingles                     | 105157 | Hutchinson's sign - herpes zoster involving nose tip         |
| Shingles                     | 52126  | Herpes zoster with other central nervous system complication |
| Shingles                     | 14793  | Herpes zoster otitis externa                                 |
| Shingles                     | 11498  | Postherpetic trigeminal neuralgia                            |
| Shingles                     | 47375  | Zoster encephalitis  |
| Shingles                     | 62558  | Infective otitis externa due to herpes zoster                |
| Shingles                     | 44944  | Herpes zoster with meningitis                                |
| Shingles                     | 63739  | Herpes zoster with other CNS complication NOS                |
| Shingles                     | 38531  | Herpes zoster with other specified complication NOS          |
| Shingles                     | 71464  | Meningitis due to herpes zoster virus                        |
| Shingles                     | 39692  | Polyneuropathy in herpes zoster                              |
| Shingles                     | 18918  | Herpes zoster ophthalmicus                                   |
| Shingles                     | 17180  | Postzoster neuralgia   |
| Shingles                     | 8936   | Ophthalmic herpes zoster infection                           |
| Shingles                     | 14718  | Herpes zoster with ophthalmic complication                   |
| Shingles                     | 21069  | Herpes zoster with unspecified complication                  |
| Shingles                     | 27403  | Geniculate herpes zoster                                     |
| Shingles                     | 25320  | Herpes zoster with dermatitis of eyelid                      |
| Sjogren's syndrome           | 21022  | Myopathy due to Sjogren's disease                            |
| Sjogren's syndrome           | 47364  | Lung disease with Sjogren's disease                          |
| Stickler's syndrome'         | 16711  | Stickler syndrome  |
| Systemic Lupus Erythematosus | 11920  | Systemic lupus erythematosus with pericarditis               |
| Systemic Lupus Erythematosus | 58706  | [X]Other forms of systemic lupus erythematosus               |
| Systemic Lupus Erythematosus | 42719  | Systemic lupus erythematosus NOS                             |
| Systemic Lupus Erythematosus | 36942  | Drug-induced systemic lupus erythematosus                    |
| Systemic Lupus Erythematosus | 20007  | Disseminated lupus erythematosus                             |
| Systemic Lupus Erythematosus | 29519  | Systemic lupus erythematosus with organ or sys involv        |
| Systemic Lupus Erythematosus | 47672  | Nephrotic syndrome in systemic lupus erythematosus           |
| Systemic Lupus Erythematosus | 106086 | SLAM - Systemic lupus activity measure                       |

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| Systemic Lupus Erythematosus | 45726  | Systemic lupus erythematosus disease activity index |
| Systemic Lupus Erythematosus | 51798  | Systemic lupus activity measure                     |
| Systemic Lupus Erythematosus | 31564  | Lung disease with systemic lupus erythematosus      |
| Systemic Lupus Erythematosus | 7871   | Systemic lupus erythematosus                        |
| Systemic Lupus Erythematosus | 101433 | Cerebral lupus                                      |
| Tendon Rupture               | 367    | Tendon rupture NOS                                  |
| Tendon Rupture               | 20562  | Rupture tendon of finger                            |
| Tendon Rupture               | 778    | Traumatic rupture of biceps tendon                  |
| Tendon Rupture               | 10186  | Rupture tendon forearm or wrist                     |
| Tendon Rupture               | 89925  | Peroneus longus rupture                             |
| Tendon Rupture               | 54266  | Rupture flexor pollicis longus                      |
| Tendon Rupture               | 43696  | Other foot and ankle tendon rupture                 |
| Tendon Rupture               | 17906  | Rupture patellar tendon                             |
| Tendon Rupture               | 5665   | Hand and wrist extensor tendon rupture              |
| Tendon Rupture               | 16601  | Nontraumatic tendon rupture                         |
| Tendon Rupture               | 11633  | Biceps tendon rupture                               |
| Tendon Rupture               | 63114  | Rupture flexor digitorum superficialis tendon       |
| Tendon Rupture               | 48913  | Rupture tendon thumb NOS                            |
| Tendon Rupture               | 31713  | Rupture extensor digitorum tendon                   |
| Tendon Rupture               | 30551  | Rupture tendon thigh                                |
| Tendon Rupture               | 7478   | Rupture Achilles tendon                             |
| Tendon Rupture               | 6264   | Rupture biceps tendon                               |
| Tendon Rupture               | 26169  | Rupture tendon upper arm                            |
| Tendon Rupture               | 12036  | Rupture supraspinatus tendon                        |
| Tendon Rupture               | 7080   | Rupture tendon of thumb                             |
| Tendon Rupture               | 36936  | Spontaneous rupture of extensor tendons             |
| Tendon Rupture               | 44799  | Rupture foot extensor tendon                        |
| Tendon Rupture               | 41938  | Long head of biceps rupture                         |
| Tendon Rupture               | 29330  | Rupture hamstring tendon                            |
| Tendon Rupture               | 10853  | Hand and wrist flexor tendon rupture                |
| Tendon Rupture               | 31974  | Nontraumatic rupture of patellar tendon             |
| Tendon Rupture               | 37850  | Extensor pollicis longus rupture                    |
| Tendon Rupture               | 29110  | Other specified tendon rupture                      |
| Tendon Rupture               | 42512  | Rupture tendon of finger NOS                        |
| Tendon Rupture               | 59364  | Flexor pollicis longus tendon rupture               |
| Tendon Rupture               | 44909  | Rupture flexor digitorum profundus tendon           |
| Tendon Rupture               | 21924  | Rotator cuff complete rupture                       |
| Tendon Rupture               | 55421  | Rupture wrist extensors                             |
| Tendon Rupture               | 22735  | Spontaneous rupture of flexor tendons               |
| Tendon Rupture               | 10430  | Rupture tendon leg or foot                          |
| Tendon Rupture               | 45558  | Rupture tendon leg or foot NOS                      |



|                |       |   |
|----------------|-------|---|
| Tendon Rupture | 30478 | Rupture subscapularis tendon                              |
| Tendon Rupture | 54684 | Flexor digitorum profundus tendon rupture                 |
| Tendon Rupture | 58147 | Flexor digitorum sublimis tendon rupture                  |
| Tendon Rupture | 58755 | Rupture tendon upper arm NOS                              |
| Tendon Rupture | 7719  | Nontraumatic rupture of Achilles tendon                   |
| Tendon Rupture | 62729 | Other nontraumatic tendon rupture                         |
| Tendon Rupture | 50350 | Tibialis posterior rupture                                |
| Tendon Rupture | 21291 | Rupture quadriceps tendon                                 |
| Tendon Rupture | 26887 | Rupture upper leg tendon NOS                              |
| Tendon Rupture | 427   | Ruptured Achilles tendon - traumatic                      |
| Tendon Rupture | 37526 | Rupture infraspinatus tendon                              |
| Tendon Rupture | 21416 | Rupture triceps tendon                                    |
| Tendon Rupture | 54392 | Rupture tendon hand or wrist NOS                          |
| Tendon Rupture | 6040  | Quadriceps tendon rupture                                 |
| Tendon Rupture | 17650 | Rupture plantaris tendon                                  |
| Tendon Rupture | 27735 | Rupture extensor pollicis longus                          |
| Tendon Rupture | 66768 | Extensor digitorum communis rupture                       |
| Tendon Rupture | 33975 | Rupture foot flexor tendon                                |
| Tendon Rupture | 49764 | [X]Spontaneous rupture of other tendons                   |
| Tendon Rupture | 66225 | Lindholm repair of ruptured tendon                        |
| Tendon Rupture | 67879 | Nontraumatic tendon rupture, unspecified                  |
| Tendon Rupture | 55427 | Rupture wrist flexors                                     |
| Tendon Rupture | 24348 | Rupture long head biceps tendon                           |
| Tuberculosis   | 42479 | Acute miliary tuberculosis of multiple sites              |
| Tuberculosis   | 97325 | Tuberculosis of sacrum/coccyx                             |
| Tuberculosis   | 53473 | Isolated tracheal or bronchial tuberculosis NOS           |
| Tuberculosis   | 5319  | H/O: tuberculosis   |
| Tuberculosis   | 56833 | Erythema nodosum with tuberculosis NOS                    |
| Tuberculosis   | 5101  | Tuberculous adenitis                                      |
| Tuberculosis   | 31445 | Tuberculosis verrucosa cutis                              |
| Tuberculosis   | 69471 | Resp TB unspcf,w/out mention/bacterial or histol confrmtn |
| Tuberculosis   | 49433 | Tuberculosis of retroperitoneal lymph nodes               |
| Tuberculosis   | 43370 | Tuberculosis of spine (Pott's)                            |
| Tuberculosis   | 48580 | Nodular lung tuberculosis                                 |
| Tuberculosis   | 45318 | Tuberculous synovitis                                     |
| Tuberculosis   | 4907  | Tuberculosis limb bones - Tuberculous dactylitis          |
| Tuberculosis   | 46926 | Tuberculosis of intrathoracic lymph nodes NOS             |
| Tuberculosis   | 23451 | Tuberculosis of knee                                      |
| Tuberculosis   | 6553  | Tuberculosis of spine                                     |
| Tuberculosis   | 73549 | Late effects of tuberculosis of bones and joints          |
| Tuberculosis   | 31436 | Tuberculosis of small intestine                           |
| Tuberculosis   | 53864 | Tuberculosis of the bones of the shoulder region          |
| Tuberculosis   | 16331 | Tuberculosis of lung with cavitation                      |
| Tuberculosis   | 46802 | Tuberculosis of spinal meninges                           |
| Tuberculosis   | 99188 | Maternal tuberculosis in pregnancy/childbirth/puerperium  |

|              |        |   |
|--------------|--------|---|
| Tuberculosis | 54570  | Other gastrointestinal tract tuberculosis                   |
| Tuberculosis | 40605  | Prim respiratory TB without mention of bact or hist confirm |
| Tuberculosis | 72743  | Tuberculous oophoritis                                      |
| Tuberculosis | 96668  | Tuberculosis endocardium                                    |
| Tuberculosis | 44129  | Tuberculosis of mediastinal lymph nodes                     |
| Tuberculosis | 37694  | Primary tuberculous infection NOS                           |
| Tuberculosis | 9158   | [V] Personal history of tuberculosis                        |
| Tuberculosis | 53331  | Miliary tuberculosis NOS                                    |
| Tuberculosis | 52272  | Tuberculous nephropathy                                     |
| Tuberculosis | 62530  | Tuberculosis of lung, confirmed histologically              |
| Tuberculosis | 66976  | Tuberculosis spleen   |
| Tuberculosis | 113107 | [X]Acute miliary tuberculosis, unspecified                  |
| Tuberculosis | 5145   | Tuberculosis of hilar lymph nodes                           |
| Tuberculosis | 24517  | Primary respiratory TB confirm bact and histologically      |
| Tuberculosis | 57466  | Tuberculous oophoritis or salpingitis                       |
| Tuberculosis | 15693  | Tuberculous bronchiectasis                                  |
| Tuberculosis | 91666  | Streptomycin resistant tuberculosis                         |
| Tuberculosis | 102673 | Isoniazid resistant tuberculosis                            |
| Tuberculosis | 30945  | Tuberculosis of testis                                      |
| Tuberculosis | 114365 | Tuberculous leptomeningitis                                 |
| Tuberculosis | 111299 | Multidrug resistant tuberculosis                            |
| Tuberculosis | 93768  | [X]Sequelae of respiratory and unspecified tuberculosis     |
| Tuberculosis | 68973  | Tuberculosis of other female genital organs NOS             |
| Tuberculosis | 12338  | Tuberculosis of other bones                                 |
| Tuberculosis | 17153  | Tuberculous mastoiditis                                     |
| Tuberculosis | 11975  | Tuberculous meningitis                                      |
| Tuberculosis | 16265  | Primary tuberculous complex                                 |
| Tuberculosis | 99783  | Tuberculosis of the bones of the hand                       |
| Tuberculosis | 23940  | Renal tuberculosis  |
| Tuberculosis | 32459  | Other specified miliary tuberculosis                        |
| Tuberculosis | 42630  | Other primary progressive tuberculosis                      |
| Tuberculosis | 67637  | Tuberculosis - lupus exedens                                |
| Tuberculosis | 47336  | Lung tuberculosis   |
| Tuberculosis | 22011  | Primary tuberculous infection                               |
| Tuberculosis | 3303   | Tuberculosis of kidney                                      |
| Tuberculosis | 30358  | Tuberculous keratoconjunctivitis                            |
| Tuberculosis | 59202  | Tuberculous encephalitis or myelitis                        |
| Tuberculosis | 62468  | Tuberculosis of bronchus                                    |
| Tuberculosis | 30687  | Tuberculosis of skin and subcutaneous tissue NOS            |
| Tuberculosis | 72008  | Acute miliary tuberculosis                                  |
| Tuberculosis | 62963  | Tuberculosis of the upper arm bone                          |
| Tuberculosis | 94249  | Keratitis due to tuberculosis                               |
| Tuberculosis | 27399  | Tuberculosis of epididymis                                  |
| Tuberculosis | 46272  | Tuberculous pleurisy in primary progressive tuberculosis    |
| Tuberculosis | 31349  | Fallopian tube tuberculosis                                 |

|              |        |  |
|--------------|--------|--|
| Tuberculosis | 49481  | Tuberculosis seminal vesicle                                 |
| Tuberculosis | 93015  | Isolated tracheal tuberculosis                               |
| Tuberculosis | 18206  | [V] Personal history of pulmonary tuberculosis               |
| Tuberculosis | 24372  | Tuberculosis of limb bones                                   |
| Tuberculosis | 57398  | Tuberculous abscess of brain                                 |
| Tuberculosis | 53548  | Tuberculosis of ureter                                       |
| Tuberculosis | 46039  | Tuberculoma of spinal cord                                   |
| Tuberculosis | 35443  | Tuberculous pleurisy, conf bacteriologically/histologically  |
| Tuberculosis | 4256   | Tuberculosis of peripheral lymph nodes                       |
| Tuberculosis | 3273   | Tuberculosis of vertebral column - Pott's                    |
| Tuberculosis | 37886  | Tuberculosis of other specified bones                        |
| Tuberculosis | 72402  | Tuberculosis of nasopharynx                                  |
| Tuberculosis | 52199  | Tuberculoma of brain   |
| Tuberculosis | 23472  | Tuberculous pleurisy   |
| Tuberculosis | 110373 | Disseminated tuberculosis                                    |
| Tuberculosis | 109312 | Prostatitis in tuberculosis                                  |
| Tuberculosis | 97922  | [X]Miliary tuberculosis, unspecified                         |
| Tuberculosis | 19652  | Tuberculous episcleritis                                     |
| Tuberculosis | 50837  | Tuberculous pyelitis   |
| Tuberculosis | 63172  | Pneumoconiosis associated with tuberculosis                  |
| Tuberculosis | 69260  | Isolated tracheal or bronchial tuberculosis                  |
| Tuberculosis | 3596   | Tuberculosis of bones and joints                             |
| Tuberculosis | 38920  | Tuberculous salpingitis                                      |
| Tuberculosis | 40231  | Tuberculosis pericardium                                     |
| Tuberculosis | 46383  | Tuberculosis of other specified organs NOS                   |
| Tuberculosis | 12448  | Tuberculous endometritis                                     |
| Tuberculosis | 97658  | Tuberculosis of nasal septum                                 |
| Tuberculosis | 31409  | Tuberculous peritonitis                                      |
| Tuberculosis | 50489  | Tuberculosis of urinary tract                                |
| Tuberculosis | 46727  | Tuberculosis of other specified organs                       |
| Tuberculosis | 31844  | Acute miliary tuberculosis of a single specified site        |
| Tuberculosis | 29395  | Late effects of tuberculosis                                 |
| Tuberculosis | 56670  | Tuberculosis oesophagus                                      |
| Tuberculosis | 53701  | Infiltrative lung tuberculosis                               |
| Tuberculosis | 61442  | Late effects of tuberculosis NOS                             |
| Tuberculosis | 95913  | Latent tuberculosis  |
| Tuberculosis | 2193   | Tuberculosis of intestines, peritoneum and mesenteric glands |
| Tuberculosis | 38110  | Pulmonary tuberculosis NOS                                   |
| Tuberculosis | 39279  | Tuberculosis of large intestine                              |
| Tuberculosis | 41383  | Other specified tuberculosis of central nervous system       |
| Tuberculosis | 65464  | Late effects of respiratory tuberculosis                     |
| Tuberculosis | 24413  | TB lung confirm sputum microscopy with or without culture    |
| Tuberculosis | 41208  | Tuberculosis of meninges and central nervous system          |
| Tuberculosis | 47016  | On tuberculosis chemoprophylaxis                             |
| Tuberculosis | 4621   | Tuberculosis lichenoides                                     |

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|--------------|--------|---|
| Tuberculosis | 63959  | Other respiratory tuberculosis                          |
| Tuberculosis | 46019  | Tuberculosis of stomach                                 |
| Tuberculosis | 42201  | Tuberculosis of other specified joint                   |
| Tuberculosis | 70140  | Tuberculosis of central nervous system NOS              |
| Tuberculosis | 20333  | Tuberculous laryngitis                                  |
| Tuberculosis | 16367  | Tuberculosis - lupus vulgaris                           |
| Tuberculosis | 45932  | Tuberculosis of other organs NOS                        |
| Tuberculosis | 93360  | Tuberculous encephalitis                                |
| Tuberculosis | 43791  | Tuberculous meningoencephalitis                         |
| Tuberculosis | 85954  | Tuberculosis support                                    |
| Tuberculosis | 26344  | Tuberculosis of peripheral lymph nodes NOS              |
| Tuberculosis | 37492  | Tuberculosis - lupus NOS                                |
| Tuberculosis | 1840   | Tuberculosis  |
| Tuberculosis | 50147  | Other specified respiratory tuberculosis NOS            |
| Tuberculosis | 16741  | Tuberculous fibrosis of lung                            |
| Tuberculosis | 115044 | Rifampicin resistant tuberculosis                       |
| Tuberculosis | 63351  | Tuberculosis cutis                                      |
| Tuberculosis | 57587  | Tuberculosis of the lower leg bone                      |
| Tuberculosis | 49112  | Tuberculous cervicitis                                  |
| Tuberculosis | 18950  | Other specified pulmonary tuberculosis                  |
| Tuberculosis | 37422  | Tuberculosis of genitourinary system                    |
| Tuberculosis | 46147  | Tuberculosis of liver                                   |
| Tuberculosis | 69322  | Tuberculous meningitis NOS                              |
| Tuberculosis | 635    | Pulmonary tuberculosis                                  |
| Tuberculosis | 62033  | Tuberculosis papulonecrotica                            |
| Tuberculosis | 58673  | Tuberculosis of ear                                     |
| Tuberculosis | 37834  | Tuberculosis of pleura                                  |
| Tuberculosis | 38342  | Tuberculous chronic iridocyclitis                       |
| Tuberculosis | 93071  | Tuberculosis of lung, confirmed by culture only         |
| Tuberculosis | 47832  | Tuberculosis of lung, bacteriologically & histology neg |
| Tuberculosis | 37598  | Tuberculosis of mediastinum                             |
| Tuberculosis | 3830   | Tuberculosis of bladder                                 |
| Tuberculosis | 54579  | Tuberculosis of gastrointestinal tract NOS              |
| Tuberculosis | 50902  | Other specified respiratory tuberculosis                |
| Tuberculosis | 59916  | Tuberculosis of the pelvic and thigh bones              |
| Tuberculosis | 58827  | Tuberculosis of intrathoracic lymph nodes               |
| Tuberculosis | 73273  | Late effects of central nervous system tuberculosis     |
| Tuberculosis | 70862  | Tuberculosis of bone NOS                                |
| Tuberculosis | 16414  | Miliary tuberculosis                                    |
| Tuberculosis | 73590  | Tuberculosis of thyroid gland                           |
| Tuberculosis | 96477  | Inactive tuberculosis                                   |
| Tuberculosis | 55629  | Tuberculous interstitial keratitis                      |
| Tuberculosis | 55835  | Tuberculosis of other organs                            |
| Tuberculosis | 50261  | Genitourinary tuberculosis NOS                          |
| Tuberculosis | 41051  | Tuberculosis lung bact and histological examin not done |

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|--------------|--------|--|
| Tuberculosis | 68154  | Tuberculosis of the forearm bone                             |
| Tuberculosis | 59087  | Tuberculosis of rectum                                       |
| Tuberculosis | 56771  | Cystitis in tuberculosis                                     |
| Tuberculosis | 56890  | Tuberculous pleurisy NOS                                     |
| Tuberculosis | 44128  | Tuberculosis of bones or joints NOS                          |
| Tuberculosis | 63796  | Tuberculous oophoritis or salpingitis NOS                    |
| Tuberculosis | 7133   | Respiratory TB not confirmed bact or histologically          |
| Tuberculosis | 54840  | Tuberculosis of cerebral meninges                            |
| Tuberculosis | 22572  | Tuberculous osteomyelitis                                    |
| Tuberculosis | 29482  | Tuberculosis of mesenteric lymph glands                      |
| Tuberculosis | 70911  | Late effects of tuberculosis of other specified organs       |
| Tuberculosis | 111439 | Tuberculosis index case                                      |
| Tuberculosis | 69154  | Tuberculosis of other male genital organs NOS                |
| Tuberculosis | 45861  | Tuberculosis of nasal sinus                                  |
| Tuberculosis | 95332  | Tuberculosis of other limb bones                             |
| Tuberculosis | 15158  | Tuberculosis NOS   |
| Tuberculosis | 72072  | Tuberculous encephalitis or myelitis NOS                     |
| Tuberculosis | 9953   | Tuberculous pneumonia  |
| Tuberculosis | 34657  | Tuberculosis of other urinary organs                         |
| Tuberculosis | 65994  | Tuberculosis of lumbar spine                                 |
| Tuberculosis | 68821  | Tuberculosis of other male genital organs                    |
| Tuberculosis | 97525  | Ciprofloxacin resistant tuberculosis                         |
| Tuberculosis | 24626  | Tuberculous arthritis  |
| Tuberculosis | 67292  | Tuberculosis of kidney NOS                                   |
| Tuberculosis | 47430  | Tuberculosis - scrofuloderma                                 |
| Tuberculosis | 67337  | Tuberculosis of thoracic spine                               |
| Tuberculosis | 31680  | Tuberculous myelitis   |
| Tuberculosis | 66441  | Tuberculous pneumothorax                                     |
| Tuberculosis | 71138  | Tuberculosis of the bones of other sites                     |
| Tuberculosis | 47881  | Tuberculosis of skin and subcutaneous tissue                 |
| Tuberculosis | 14913  | Tuberculous hydrothorax                                      |
| Tuberculosis | 66584  | Tuberculosis of other female genital organs                  |
| Tuberculosis | 67601  | Tuberculosis of the bones of the ankle and foot              |
| Tuberculosis | 46675  | Lupus - tuberculous  |
| Tuberculosis | 50869  | Tuberculosis myocardium                                      |
| Tuberculosis | 106837 | [X]Other tuberculosis of nervous system                      |
| Tuberculosis | 60040  | Tuberculosis of prostate                                     |
| Tuberculosis | 46044  | Tuberculous abscess of spinal cord                           |
| Tuberculosis | 34640  | Tuberculous erythema nodosum                                 |
| Tuberculosis | 40990  | Late effects of genitourinary system tuberculosis            |
| Tuberculosis | 58588  | Tuberculosis of lung, confirmed by unspecified means         |
| Tuberculosis | 113105 | Tuberculosis of anus   |
| Tuberculosis |        | Tuberculosis with erythema nodosum hypersensitivity reaction |
| Tuberculosis | 44573  |  |
| Tuberculosis | 43976  | Tuberculosis of eye  |

|              |        |  |
|--------------|--------|--|
| Tuberculosis | 99925  | Encephalitis due to tuberculosis                             |
| Tuberculosis | 37329  | Tuberculous chorioretinitis                                  |
| Tuberculosis | 44039  | Tuberculosis of larynx, trachea & bronchus conf bact/hist'y  |
| Tuberculosis | 31670  | Resp TB bacteriologically and histologically confirmed       |
| Tuberculosis | 99305  | Tuberculosis of bone, site unspecified                       |
| Tuberculosis | 70293  | Tuberculosis of cervical spine                               |
| Tuberculosis | 99593  | Tuberculosis of the bones of multiple sites                  |
| Tuberculosis | 49235  | Tuberculous pyelonephritis                                   |
| Tuberculosis | 33372  | Other gastrointestinal tract tuberculosis NOS                |
| Tuberculosis | 114224 | Tuberculosis of limb bones NOS                               |
| Tuberculosis | 44655  | TB intrathoracic lymph nodes confirm bact histologically     |
| Tuberculosis | 99914  | Tuberculosis of unspecified limb bone                        |
| Tuberculosis | 57417  | Tuberculoma of meninges                                      |
| Tuberculosis | 100469 | History of tuberculosis drug therapy                         |
| Tuberculosis | 34430  | Other specified tuberculosis                                 |
| Tuberculosis | 106978 | [X]Sequelae of tuberculosis of bones and joints              |
| Tuberculosis | 106713 | Other specified tuberculosis support                         |
| Tuberculosis | 106521 | [X]Other miliary tuberculosis                                |
| Tuberculosis | 3720   | Tuberculous - cervical lymphadenitis                         |
| Tuberculosis | 39512  | Tuberculous empyema  |
| Tuberculosis | 51110  | Scrofulous tuberculous abscess                               |
| Tuberculosis | 2208   | Tuberculosis of hip  |
| Tuberculosis | 35760  | Tuberculosis of adrenal glands - Addison's disease           |
| Tuberculosis | 58140  | Maternal tuberculosis,unspec whether in pregnancy/puerperium |
| Tuberculosis | 70491  | Tuberculosis of eye NOS                                      |
| Tuberculosis | 40522  | Scrofula - tuberculous cervical lymph nodes                  |
| Tuberculosis | 93948  | Isolated bronchial tuberculosis                              |
| Tuberculosis | 49503  | Tuberculosis of tracheobronchial lymph nodes                 |
| Uveitis      | 19645  | Posterior cyclitis   |
| Uveitis      | 37329  | Tuberculous chorioretinitis                                  |
| Uveitis      | 39964  | Unspecified focal chorioretinitis                            |
| Uveitis      | 55312  | Peripheral focal retinochoroiditis                           |
| Uveitis      | 10999  | Posterior uveitis NOS  |
| Uveitis      | 55978  | Peripheral focal chorioretinitis                             |
| Uveitis      | 31555  | Uveitis due to secondary syphilis                            |
| Uveitis      | 22532  | Pigmented epithelial disseminated retinitis                  |
| Uveitis      | 21685  | Panuveitis   |
| Uveitis      | 32239  | Focal chorioretinitis or retinochoroiditis NOS               |
| Uveitis      | 94836  | Histoplasmosis with retinitis                                |
| Uveitis      | 43496  | Disseminated chorioretinitis and retinochoroiditis           |
| Uveitis      | 16194  | Other chorioretinitis or retinochoroiditis NOS               |
| Uveitis      | 10579  | Acute and subacute iridocyclitis                             |
| Uveitis      | 58055  | Other chorioretinitis and retinochoroiditis                  |
| Uveitis      | 66369  | Unspecified disseminated chorioretinitis                     |

|         |        |  |
|---------|--------|--|
| Uveitis | 17313  | Diabetic iritis  |
| Uveitis | 97455  | Other posterior pole focal retinitis                   |
| Uveitis | 91596  | Certain types of cyclitis NOS                          |
| Uveitis | 14731  | Unspecified iridocyclitis                              |
| Uveitis | 34170  | Focal chorioretinitis and retinochoroiditis            |
| Uveitis | 99779  | Disseminated chorioretinitis and retinochoroiditis NOS |
| Uveitis | 31684  | Sympathetic uveitis                                    |
| Uveitis | 478    | Iritis - acute   |
| Uveitis | 36804  | Vogt-Koyanagi syndrome                                 |
| Uveitis | 106506 | Gonococcal iridocyclitis                               |
| Uveitis | 45908  | Focal juxtapapillary choroiditis                       |
| Uveitis | 6849   | Acute or subacute iritis NOS                           |
| Uveitis | 67906  | Metastatic disseminated retinitis                      |
| Uveitis | 98959  | Multifocal choroiditis                                 |
| Uveitis | 50067  | Gouty iritis   |
| Uveitis | 61223  | Herpes simplex iridocyclitis                           |
| Uveitis | 43159  | Unspecified acute iridocyclitis                        |
| Uveitis | 55940  | Herpes zoster iridocyclitis                            |
| Uveitis | 92888  | Secondary infected iridocyclitis                       |
| Uveitis | 69723  | Primary iridocyclitis                                  |
| Uveitis | 27424  | Focal macular retinochoroiditis                        |
| Uveitis | 58738  | Syphilitic disseminated retinochoroiditis              |
| Uveitis | 16629  | Retinitis and chorioretinitis                          |
| Uveitis | 7882   | Pars planitis  |
| Uveitis | 111992 | Secondary syphilitic iridocyclitis                     |
| Uveitis | 63210  | Unspecified subacute iridocyclitis                     |
| Uveitis | 39882  | Harada's disease                                       |
| Uveitis | 39637  | Retinitis proliferans                                  |
| Uveitis | 4785   | Choroiditis NOS  |
| Uveitis | 72481  | Certain types of iridocyclitis                         |
| Uveitis | 94848  | Other posterior pole focal chorioretinitis             |
| Uveitis | 2703   | Iridocyclitis  |
| Uveitis | 2245   | Anterior uveitis                                       |
| Uveitis | 16264  | Retinitis NOS  |
| Uveitis | 50581  | Congenital syphilitic choroiditis                      |
| Uveitis | 101577 | Secondary syphilitic uveitis NOS                       |
| Uveitis | 99575  | Syphilitic uveitis unspecified                         |
| Uveitis | 57076  | Histoplasma capsulatum with retinitis                  |
| Uveitis | 65993  | General disseminated chorioretinitis                   |
| Uveitis | 31619  | Toxoplasma chorioretinitis                             |
| Uveitis | 54389  | Secondary noninfected iridocyclitis                    |
| Uveitis | 477    | Uveitis NOS  |
| Uveitis | 96303  | Focal juxtapapillary retinitis                         |
| Uveitis | 98094  | Iritis   |
| Uveitis | 72903  | Secondary syphilitic chorioretinitis                   |

|                     |        |   |
|---------------------|--------|---|
| Uveitis             | 103519 | Histoplasma duboisii with retinitis         |
| Uveitis             | 72546  | Lens-induced iridocyclitis                  |
| Uveitis             | 110821 | Disseminated posterior pole chorioretinitis |
| Uveitis             | 110971 | [X]Other iridocyclitis                      |
| Vitreous Detachment | 979    | Vitreous detachment                         |
| Vitreous Detachment | 100995 | Posterior vitreous detachment               |



**Drug code lists in Aurum**

| <b>Drug</b>   | <b>procodeid</b>  | <b>Description</b>  |
|---------------|-------------------|---|
| Cephalosporin | 233041000033118   | Cefuroxime 250mg tablets  |
| Cephalosporin | 226541000033116   | Cefoxitin 2g powder for solution for injection vials  |
| Cephalosporin | 3084241000033110  | Cefalexin 250mg tablets   |
| Cephalosporin | 235241000033110   | Ceporex 500mg tablets (Strides Pharma UK Ltd)   |
| Cephalosporin | 1581541000033110  | Ceftazidime 3g powder for solution for injection vials  |
| Cephalosporin | 225541000033110   | Ceftizoxime Injection 2 g<br>Renoxitin 1g powder for solution for injection vials (Renascience Pharma Ltd)                    |
| Cephalosporin | 13135041000000000 |   |
| Cephalosporin | 232341000033112   | Ceporex 125mg/5ml syrup (Strides Pharma UK Ltd)<br>Baxan 250mg/5ml oral suspension (Bristol-Myers Squibb Pharmaceuticals Ltd) |
| Cephalosporin | 115941000033114   | Baxan 125mg/5ml oral suspension (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Cephalosporin | 115841000033118   |   |
| Cephalosporin | 275841000033111   | Claforan 2g powder for solution for injection vials (Sanofi)  |
| Cephalosporin | 3914841000033110  | Suprax Capsules 400 mg  |
| Cephalosporin | 223041000033116   | Ceftazidime Infusion 2 grams/100 ml   |
| Cephalosporin | 10745441000000000 | Ceftobiprole 500mg powder for solution for infusion vials   |
| Cephalosporin | 811441000033113   | Latamoxef Disodium Injection 1 g  |
| Cephalosporin | 231741000033119   | Cefaclor 250mg/5ml oral suspension  |
| Cephalosporin | 926841000033115   | Moxalactam Injection 500 mg   |
| Cephalosporin | 228941000033111   | Cefuroxime 125mg granules sachets<br>Fortum Monovial 2g powder for solution for injection vials (GlaxoSmithKline UK Ltd)      |
| Cephalosporin | 1610641000033110  |   |
| Cephalosporin | 232441000033118   | Ceporex 250mg/5ml syrup (Strides Pharma UK Ltd)   |
| Cephalosporin | 1180741000033110  | Rocephin 2g powder for solution for injection vials (Roche Products Ltd)  |
| Cephalosporin | 222641000033119   | Cefodizime Sodium Injection 1 gram/vial   |
| Cephalosporin | 606341000033115   | Fortum Saline infusion kit 2 grams/50 ml  |
| Cephalosporin | 230741000033112   | Cefaclor 125mg/5ml oral suspension sugar free   |
| Cephalosporin | 223241000033112   | Ceftazidime Injection 2 grams/50 ml vial  |
| Cephalosporin | 5539241000033110  | Rocephin Powder And Solution For Intravenous Injection 500 mg vial  |
| Cephalosporin | 799241000033114   | Kefadol Injection 500 mg  |
| Cephalosporin | 3084341000033110  | Cefalexin 500mg tablets   |
| Cephalosporin | 226041000033114   | Ceftazidime 250mg powder for solution for injection vials   |
| Cephalosporin | 967541000033111   | Nicef 500mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 220941000033113   | Ceporex 250mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 219741000033111   | Cefaclor 500mg capsules   |
| Cephalosporin | 800041000033111   | Kefadim 2g powder for solution for injection vials (Flynn Pharma Ltd)   |
| Cephalosporin | 1558241000033110  | Zinnat 125mg tablets (GlaxoSmithKline UK Ltd)   |
| Cephalosporin | 1557341000033110  | Zinnat 250mg tablets (GlaxoSmithKline UK Ltd)   |
| Cephalosporin | 229041000033119   | Ceftazidime Saline infusion kit 2 grams/50 ml   |
| Cephalosporin | 227841000033116   | Cefaclor M/R tablets 500 mg   |
| Cephalosporin | 232741000033113   | Cefixime 200mg tablets  |
| Cephalosporin | 1554741000033110  | Zinacef 1.5g powder for injection vials (GlaxoSmithKline UK Ltd)  |

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|---------------|-------------------|---|
| Cephalosporin | 802741000033110   | Keflex 125mg/5ml oral suspension (Flynn Pharma Ltd)   |
| Cephalosporin | 220541000033119   | Cefadroxil 500mg capsules   |
| Cephalosporin | 222941000033114   | Ceftriaxone 250mg powder for solution for injection vials<br>Mefoxin 1g powder for solution for injection vials (Organon Pharma (UK) Ltd)               |
| Cephalosporin | 877941000033117   |   |
| Cephalosporin | 439041000033115   | Distaclor Capsules 250 mg   |
| Cephalosporin | 222741000033111   | Ceftriaxone 1g powder for solution for injection vials  |
| Cephalosporin | 6028241000033110  | Zinnat Suspension 250 mg/5 ml   |
| Cephalosporin | 227741000033114   | Cefaclor 375mg modified-release tablets   |
| Cephalosporin | 796841000033118   | Keflex 250mg capsules (Flynn Pharma Ltd)  |
| Cephalosporin | 2831841000033110  | Zinnat Tablets 500 mg   |
| Cephalosporin | 227041000033111   | Cefsulodin Sodium Injection 1 g/vial  |
| Cephalosporin | 926641000033116   | Moxalactam Injection 1 g<br>Zavicefta 2g/0.5g powder for concentrate for solution for infusion vials (Pfizer Ltd)                                       |
| Cephalosporin | 12195741000000000 |   |
| Cephalosporin | 967441000033110   | Nicef 250mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 803141000033116   | Keftid 125mg/5ml oral suspension (Strides Pharma UK Ltd)  |
| Cephalosporin | 811641000033110   | Latamoxef Disodium Injection 2 g  |
| Cephalosporin | 1511941000033110  | Velosef 250mg/5ml syrup (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Cephalosporin | 219941000033114   | Ceftibuten Dihydrate Capsules 400 mg  |
| Cephalosporin | 230541000033116   | Ceftibuten Dihydrate Suspension 18 mg/ml  |
| Cephalosporin | 1506141000033110  | Velosef 500mg capsules (Bristol-Myers Squibb Pharmaceuticals Ltd)   |
| Cephalosporin | 220441000033115   | Cefaclor 250mg capsules   |
| Cephalosporin | 233141000033119   | Cefpodoxime 100mg tablets   |
| Cephalosporin | 1180641000033110  | Rocephin 1g powder for solution for injection vials (Roche Products Ltd)  |
| Cephalosporin | 600141000033115   | Fortum 1g powder for solution for injection vials (GlaxoSmithKline UK Ltd)  |
| Cephalosporin | 4290941000033110  | Britacef 750mg powder for injection vials (Genus Pharmaceuticals Ltd)   |
| Cephalosporin | 1554941000033110  | Zinacef 750mg powder for injection vials (GlaxoSmithKline UK Ltd)   |
| Cephalosporin | 225941000033116   | Ceftazidime 2g powder for solution for injection vials<br>Velosef 1g powder for solution for injection vials (Bristol-Myers Squibb Pharmaceuticals Ltd) |
| Cephalosporin | 1507841000033110  |   |
| Cephalosporin | 3085141000033110  | Cefradine 250mg/5ml oral solution   |
| Cephalosporin | 3085041000033110  | Cefradine 500mg powder for solution for injection vials   |
| Cephalosporin | 1506041000033110  | Velosef 250mg capsules (Bristol-Myers Squibb Pharmaceuticals Ltd)   |
| Cephalosporin | 3084841000033110  | Cefradine 500mg capsules<br>Rocephin 250mg powder for solution for injection vials (Roche Products Ltd)   |
| Cephalosporin | 1180841000033110  |   |
| Cephalosporin | 231041000033117   | Cefadroxil 125mg/5ml oral suspension  |
| Cephalosporin | 230141000033113   | Cefuroxime 125mg/5ml oral suspension  |
| Cephalosporin | 223141000033117   | Ceftazidime Injection 1 gram/20 ml vial   |
| Cephalosporin | 231541000033110   | Cefadroxil 250mg/5ml oral suspension  |
| Cephalosporin | 3084941000033110  | Cefradine 1g powder for solution for injection vials  |
| Cephalosporin | 226841000033119   | Cefuroxime 750mg powder for injection vials   |
| Cephalosporin | 225841000033112   | Cefotaxime 500mg powder for solution for injection vials  |
| Cephalosporin | 275941000033115   | Claforan 500mg powder for solution for injection vials (Sanofi)   |
| Cephalosporin | 2617541000033110  | Bacti-clor MR 375mg tablets (Ranbaxy (UK) Ltd)  |

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| Cephalosporin | 5747941000033110  | Cefalexin 125mg/5ml oral suspension sugar free  |
| Cephalosporin | 1554841000033110  | Zinacef 250mg powder for injection vials (GlaxoSmithKline UK Ltd)                                     |
| Cephalosporin | 797641000033116   | Keftid 250mg capsules (Strides Pharma UK Ltd)   |
| Cephalosporin | 1015141000033110  | Orelox 40mg/5ml oral suspension paediatric (Sanofi)   |
| Cephalosporin | 3084741000033110  | Cefradine 250mg capsules  |
| Cephalosporin | 232541000033117   | Ceporex 500mg/5ml syrup (Strides Pharma UK Ltd)   |
| Cephalosporin | 221041000033115   | Ceporex 500mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 1393841000033110  | Suprax Paediatric 100mg/5ml oral suspension (Sanofi)  |
| Cephalosporin | 226141000033113   | Ceftazidime 500mg powder for solution for injection vials   |
| Cephalosporin | 231641000033111   | Cefadroxil 500mg/5ml oral suspension  |
| Cephalosporin | 230041000033114   | Cefixime 100mg/5ml oral suspension  |
| Cephalosporin | 433941000033116   | Distaclor 500mg capsules (Flynn Pharma Ltd)   |
| Cephalosporin | 13135341000000000 | Renoxitin 2g powder for solution for injection vials (Renescience Pharma Ltd)                         |
| Cephalosporin | 230641000033115   | Ceftibuten Dihydrate Suspension 36 mg/ml  |
| Cephalosporin | 460441000033112   | Distaclor 250mg/5ml oral suspension (Flynn Pharma Ltd)  |
| Cephalosporin | 224241000033114   | Cefsulodin Injection 500 mg/vial  |
| Cephalosporin | 878041000033119   | Mefoxin 2g powder for solution for injection vials (Organon Pharma (UK) Ltd)                          |
| Cephalosporin | 12395841000000000 | Cefixime 400mg tablets  |
| Cephalosporin | 799041000033118   | Kefadol 1g powder for solution for injection vials (Dista Products Ltd)                               |
| Cephalosporin | 4373141000033110  | Cefalexin 250mg/5ml oral suspension sugar free  |
| Cephalosporin | 1610741000033110  | Fortum 3g powder for solution for injection vials (GlaxoSmithKline UK Ltd)                            |
| Cephalosporin | 225641000033111   | Ceftizoxime Injection 500 mg  |
| Cephalosporin | 452341000033110   | Distaclor MR 375mg tablets (Flynn Pharma Ltd)   |
| Cephalosporin | 224141000033119   | Cefoxitin 1g powder for solution for injection vials  |
| Cephalosporin | 3084541000033110  | Cefalexin 250mg/5ml oral suspension   |
| Cephalosporin | 226741000033112   | Cefuroxime 250mg powder for injection vials   |
| Cephalosporin | 235141000033115   | Ceporex 250mg tablets (Strides Pharma UK Ltd)   |
| Cephalosporin | 4290641000033110  | Britacef 250mg powder for injection vials (Genus Pharmaceuticals Ltd)                                 |
| Cephalosporin | 10740741000000000 | Zerbaxa 1g/0.5g powder for concentrate for solution for infusion vials (Merck Sharp & Dohme (UK) Ltd) |
| Cephalosporin | 224541000033111   | Cefuroxime 1.5g powder for injection vials  |
| Cephalosporin | 803441000033112   | Keflex 500mg tablets (Flynn Pharma Ltd)   |
| Cephalosporin | 453841000033111   | Distaclor Mr M/R tablets 500 mg   |
| Cephalosporin | 1556241000033110  | Zinnat Suspension 125mg granules sachets (GlaxoSmithKline UK Ltd)                                     |
| Cephalosporin | 600341000033117   | Fortum 250mg powder for solution for injection vials (GlaxoSmithKline UK Ltd)                         |
| Cephalosporin | 4290441000033110  | Britacef 1.5g powder for injection vials (Genus Pharmaceuticals Ltd)                                  |
| Cephalosporin | 600441000033111   | Fortum 500mg powder for solution for injection vials (GlaxoSmithKline UK Ltd)                         |
| Cephalosporin | 8127141000033110  | Zinforo 600mg powder for concentrate for solution for infusion vials (Pfizer Ltd)                     |
| Cephalosporin | 926741000033113   | Moxalactam Injection 2 g  |
| Cephalosporin | 225741000033119   | Cefotaxime 2g powder for solution for injection vials   |
| Cephalosporin | 235441000033111   | Cefuroxime 125mg tablets  |
| Cephalosporin | 798141000033113   | Keflex-C Chewable tablets 250 mg  |

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| Cephalosporin | 5539441000033110  | Rocephin Powder And Solution For Intramuscular Injection 500 mg vial   |
| Cephalosporin | 1017041000033110  | Orelox 100mg tablets (Sanofi)  |
| Cephalosporin | 10740641000000000 | Ceftolozane 1g / Tazobactam 500mg powder for solution for infusion vials   |
| Cephalosporin | 811741000033118   | Latamoxef Disodium Injection 500 mg  |
| Cephalosporin | 796941000033114   | Keflex 500mg capsules (Flynn Pharma Ltd)   |
| Cephalosporin | 12195641000000000 | Ceftazidime 2g / Avibactam 500mg powder for solution for infusion vials  |
| Cephalosporin | 8127041000033110  | Ceftaroline fosamil 600mg powder for solution for infusion vials   |
| Cephalosporin | 2831741000033110  | Cefuroxime Tablets 500 mg  |
| Cephalosporin | 1398741000033110  | Suprax 200mg tablets (Sanofi)  |
| Cephalosporin | 1557041000033110  | Zinnat 125mg/5ml oral suspension (GlaxoSmithKline UK Ltd)  |
| Cephalosporin | 798041000033114   | Keflex-C Chewable tablets 125 mg   |
| Cephalosporin | 600241000033110   | Fortum 2g powder for solution for injection vials (GlaxoSmithKline UK Ltd)<br>Velosef 500mg powder for solution for injection vials (Bristol-Myers Squibb Pharmaceuticals Ltd) |
| Cephalosporin | 1507941000033110  | Pharmaceuticals Ltd)   |
| Cephalosporin | 228441000033118   | Cefpodoxime 40mg/5ml oral suspension   |
| Cephalosporin | 3084441000033110  | Cefalexin 125mg/5ml oral suspension  |
| Cephalosporin | 224041000033118   | Cefotaxime 1g powder for solution for injection vials  |
| Cephalosporin | 224441000033110   | Ceftizoxime Injection 1 g  |
| Cephalosporin | 275741000033118   | Claforan 1g powder for solution for injection vials (Sanofi)   |
| Cephalosporin | 3084641000033110  | Cefalexin 500mg/5ml oral suspension  |
| Cephalosporin | 3084141000033110  | Cefalexin 500mg capsules   |
| Cephalosporin | 799141000033119   | Kefadol Injection 2 g  |
| Cephalosporin | 230841000033119   | Cefaclor 250mg/5ml oral suspension sugar free<br>Baxan 500mg/5ml oral suspension (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Cephalosporin | 116041000033116   | Ltd)   |
| Cephalosporin | 230941000033110   | Cefaclor 125mg/5ml oral suspension   |
| Cephalosporin | 223341000033119   | Ceftazidime Injection 500 mg/10 ml vial  |
| Cephalosporin | 803341000033118   | Keflex 250mg tablets (Flynn Pharma Ltd)<br>Zevtera 500mg powder for concentrate for solution for infusion vials (Correvio UK Ltd)  |
| Cephalosporin | 10745541000000000 |  |
| Cephalosporin | 803241000033111   | Keftid 250mg/5ml oral suspension (Strides Pharma UK Ltd)   |
| Cephalosporin | 3084041000033110  | Cefalexin 250mg capsules   |
| Cephalosporin | 802841000033117   | Keflex 250mg/5ml oral suspension (Flynn Pharma Ltd)  |
| Cephalosporin | 460341000033118   | Distaclor 125mg/5ml oral suspension (Flynn Pharma Ltd)   |
| Cephalosporin | 799941000033117   | Kefadim 1g powder for solution for injection vials (Flynn Pharma Ltd)  |
| Cephalosporin | 104041000033114   | Baxan 500mg capsules (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Cephalosporin | 224341000033116   | Ceftazidime 1g powder for solution for injection vials   |
| Cephalosporin | 797741000033113   | Keftid 500mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 222841000033118   | Ceftriaxone 2g powder for solution for injection vials   |
| Coamoxiclav   | 2186941000033110  | Amiclav 250mg/125mg tablets (Ashbourne Pharmaceuticals Ltd)  |
| Coamoxiclav   | 330441000033114   | Co-amoxiclav 500mg/100mg powder for solution for injection vials   |
| Coamoxiclav   | 95141000033116    | Augmentin Tablets  |
| Coamoxiclav   | 1594141000033110  | Co-amoxiclav 875mg/125mg tablets   |
| Coamoxiclav   | 93141000033115    | Augmentin 375mg dispersible tablets (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav   | 95041000033115    | Augmentin 625mg tablets (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav   | 367541000033116   | Co-amoxiclav 400mg/57mg/5ml oral suspension sugar free   |

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| Coamoxiclav    | 2291041000033110  | Ranclav 250mg/62mg/5ml SF oral suspension (Ranbaxy (UK) Ltd)<br>Augmentin Es-600 Powder For Oral Suspension 600 mg/5 ml + 42.9 mg/5  |
| Coamoxiclav    | 5492641000033110  | ml   |
| Coamoxiclav    | 330541000033110   | Co-amoxiclav 1000mg/200mg powder for solution for injection vials  |
| Coamoxiclav    | 289041000033111   | Co-Amoxiclav Injection 1.2 gram vial   |
| Coamoxiclav    | 5697041000033110  | Co-amoxiclav 125mg/31mg/5ml oral suspension  |
| Coamoxiclav    | 317241000033119   | Co-Amoxiclav Dispersible tablets   |
| Coamoxiclav    | 370141000033116   | Co-amoxiclav 500mg/125mg tablets<br>Augmentin Intravenous 600mg powder for solution for injection vials<br>(GlaxoSmithKline UK Ltd)  |
| Coamoxiclav    | 92741000033114    |  |
| Coamoxiclav    | 289141000033110   | Co-Amoxiclav Injection 600 mg vial<br>Augmentin Intravenous 1.2g powder for solution for injection vials<br>(GlaxoSmithKline UK Ltd) |
| Coamoxiclav    | 92641000033117    |  |
| Coamoxiclav    | 317741000033113   | Co-amoxiclav 250mg/125mg dispersible tablets sugar free  |
| Coamoxiclav    | 366941000033113   | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free   |
| Coamoxiclav    | 359241000033115   | Co-Amoxiclav S/f paediatric suspension   |
| Coamoxiclav    | 369241000033113   | Co-Amoxiclav Tablets   |
| Coamoxiclav    | 359141000033110   | Co-Amoxiclav S/f junior suspension   |
| Coamoxiclav    | 370041000033115   | Co-amoxiclav 250mg/125mg tablets   |
| Coamoxiclav    | 5697141000033110  | Co-amoxiclav 250mg/62mg/5ml oral suspension  |
| Coamoxiclav    | 2290841000033110  | Ranclav 625mg tablets (Ranbaxy (UK) Ltd)   |
| Coamoxiclav    | 1572541000033110  | Augmentin 1 G Tablets  |
| Coamoxiclav    | 2290941000033110  | Ranclav 125mg/31mg/5ml SF oral suspension (Ranbaxy (UK) Ltd)   |
| Coamoxiclav    | 5331141000033110  | Augmentin Sr M/R tablets 1000 mg + 62.5 mg   |
| Coamoxiclav    | 94441000033113    | Augmentin Paediatric suspension  |
| Coamoxiclav    | 2290741000033110  | Ranclav 375mg tablets (Ranbaxy (UK) Ltd)   |
| Coamoxiclav    | 94841000033111    | Augmentin-Duo 400/57 oral suspension (GlaxoSmithKline UK Ltd)  |
| Coamoxiclav    | 367041000033114   | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free   |
| Coamoxiclav    | 94941000033115    | Augmentin 375mg tablets (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav    | 94741000033118    | Augmentin 250/62 SF oral suspension (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav    | 94641000033110    | Augmentin 125/31 SF oral suspension (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav    | 93941000033118    | Augmentin Junior suspension  |
| Corticosteroid | 9216541000033110  | Triamcinolone hexacetonide 20mg/1ml suspension for injection ampoules  |
| Corticosteroid | 431541000033114   | Deltacortril 2.5mg gastro-resistant tablets (Phoenix Labs Ltd)   |
| Corticosteroid | 5497541000033110  | Decadron Elixir 500 micrograms/5 ml  |
| Corticosteroid | 10212341000000000 | Prednisolone 20mg tablets  |
| Corticosteroid | 11507841000000000 | Prednisolone 1mg gastro-resistant tablets  |
| Corticosteroid | 5900741000033110  | Dexamethasone 5mg/5ml oral suspension  |
| Corticosteroid | 2623741000033110  | Hydrocortisone 5mg/5ml oral suspension sugar free  |
| Corticosteroid | 12568941000000000 | Dexamethasone (base) 6.6mg/2ml solution for injection vials  |
| Corticosteroid | 10262941000000000 | Budesonide 9mg modified-release tablets  |
| Corticosteroid | 10266841000000000 | Prednisolone 5mg/5ml oral solution unit dose   |
| Corticosteroid | 11072241000000000 | Dexamethasone 4mg soluble tablets sugar free   |
| Corticosteroid | 12633241000000000 | Hydrocortisone 500microgram granules in capsules for opening   |
| Corticosteroid | 879941000033111   | Methylprednisolone Sodium Succinate Injection 125 mg/vial  |
| Corticosteroid | 6512041000033110  | Budesonide 9mg gastro-resistant granules sachets   |

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| Corticosteroid | 423441000033112   | Dexamethasone Injection 4 mg   |
| Corticosteroid | 1119141000033110  | Prednisolone Injection 16 mg/ml  |
| Corticosteroid | 12633341000000000 | Hydrocortisone 1mg granules in capsules for opening  |
| Corticosteroid | 1137241000033110  | Precortisyl Forte Tablets 25 mg  |
| Corticosteroid | 498241000033111   | Efcortelan Soluble Injection 100 mg/vial   |
| Corticosteroid | 423141000033116   | Depo-Medrone 40mg/1ml suspension for injection vials (Pfizer Ltd)  |
| Corticosteroid | 4214041000033110  | Beclometasone 5mg gastro-resistant modified-release tablets  |
| Corticosteroid | 1470141000033110  | Triamcinolone Tablets 2 mg   |
| Corticosteroid | 914641000033116   | Min-I-Mix Methylprednisolone Injection 1 g/vial  |
| Corticosteroid | 12389641000000000 | Glensoludex 4mg soluble tablets (Glenmark Pharmaceuticals Europe Ltd)  |
| Corticosteroid | 12389541000000000 | Glensoludex 2mg soluble tablets (Glenmark Pharmaceuticals Europe Ltd)  |
| Corticosteroid | 430841000033118   | Decadron 500microgram tablets (Organon Pharma (UK) Ltd)  |
| Corticosteroid | 1131741000033110  | Prednisolone 1mg tablets   |
| Corticosteroid | 898441000033115   | Medrone 100mg tablets (Pfizer Ltd)   |
| Corticosteroid | 1601441000033110  | Deflazacort 1mg tablets  |
| Corticosteroid | 2760841000033110  | Dexamethasone Injection 5 mg/ml, 2 ml vial   |
| Corticosteroid | 1470241000033110  | Triamcinolone Tablets 4 mg   |
| Corticosteroid | 1461041000033110  | Triamcinolone Hexacetonide Injection 5 mg/ml   |
| Corticosteroid | 5990341000033110  | Prednisone 5mg modified-release tablets  |
| Corticosteroid | 12398341000000000 | Neofordex 40mg tablets (Aspire Pharma Ltd)   |
| Corticosteroid | 2372141000033110  | *Cortisone Acetate Tablets   |
| Corticosteroid | 5329841000033110  | Kenalog Intra-articular / Intramuscular 40mg/1ml suspension for injection vials (Bristol-Myers Squibb Pharmaceuticals Ltd) |
| Corticosteroid | 1718241000033110  | Budenofalk 3mg gastro-resistant capsules (Dr. Falk Pharma UK Ltd)  |
| Corticosteroid | 13010241000000000 | Hydventia 10mg tablets (OcXia)   |
| Corticosteroid | 422841000033117   | Deltastab 25mg/1ml suspension for injection ampoules (Advanz Pharma)   |
| Corticosteroid | 2509441000033110  | *Prednisolone Granules   |
| Corticosteroid | 3867541000033110  | Adcortyl Intra-articular / Intradermal 50mg/5ml suspension for injection vials (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Corticosteroid | 904141000033111   | Methylprednisolone 2mg tablets   |
| Corticosteroid | 422741000033110   | Decadron Injection 4 mg/ml   |
| Corticosteroid | 740241000033111   | Hydrocortisone 10mg/5ml oral suspension  |
| Corticosteroid | 12568841000000000 | Dexamethasone (base) 6.6mg/2ml solution for injection ampoules   |
| Corticosteroid | 423541000033113   | Dexamethasone Phosphate Injection 4 mg/ml  |
| Corticosteroid | 5329741000033110  | Triamcinolone acetonide 40mg/1ml suspension for injection vials  |
| Corticosteroid | 429441000033110   | Deltastab Tablets 1 mg   |
| Corticosteroid | 5990641000033110  | Lodotra 1mg modified-release tablets (Napp Pharmaceuticals Ltd)  |
| Corticosteroid | 9122441000033110  | Dexamethasone 10mg/5ml oral solution sugar free  |
| Corticosteroid | 879841000033115   | Methylprednisolone Sodium Succinate Injection 1 gram/vial  |
| Corticosteroid | 1131941000033110  | Prednisolone 5mg tablets   |
| Corticosteroid | 1132141000033110  | Prednisone Tablets 5 mg  |
| Corticosteroid | 887041000033114   | Methylprednisolone Sodium Succinate Injection 40 mg/vial   |
| Corticosteroid | 10212741000000000 | Pevanti 20mg tablets (Advanz Pharma)   |
| Corticosteroid | 878641000033113   | Methylprednisolone acetate 40mg/1ml suspension for injection vials   |
| Corticosteroid | 143041000033117   | Betnelan 500microgram tablets (Focus Pharmaceuticals Ltd)  |
| Corticosteroid | 10212641000000000 | Pevanti 10mg tablets (Advanz Pharma)   |

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| Corticosteroid | 3978641000033110  | Efcortisol 500mg/5ml solution for injection ampoules (Advanz Pharma)  |
| Corticosteroid | 1465341000033110  | Triamcinolone acetonide 40mg/1ml suspension for injection pre-filled syringes   |
| Corticosteroid | 5900641000033110  | Dexamethasone 5mg/5ml oral solution   |
| Corticosteroid | 169341000033114   | Budesonide 3mg gastro-resistant modified-release capsules   |
| Corticosteroid | 372141000033115   | Cortistab Tablets 25 mg   |
| Corticosteroid | 1461241000033110  | Triamcinolone Acetonide Injection 10 mg/ml  |
| Corticosteroid | 1459541000033110  | Triamcinolone Acetonide Injection 40 mg/ml  |
| Corticosteroid | 144841000033114   | Betnesol 500microgram soluble tablets (Focus Pharmaceuticals Ltd)   |
| Corticosteroid | 336441000033112   | Corlan 2.5mg Pellets (Auden McKenzie (Pharma Division) Ltd)   |
| Corticosteroid | 844041000033112   | Locoid Crelo 0.1% topical emulsion (LEO Pharma)   |
| Corticosteroid | 1465441000033110  | Triamcinolone acetonide 80mg/2ml suspension for injection pre-filled syringes   |
| Corticosteroid | 1114341000033110  | Prednisolone 5mg gastro-resistant tablets   |
| Corticosteroid | 369541000033110   | Cortisone Acetate Tablets 5 mg  |
| Corticosteroid | 903141000033113   | Methylprednisolone 16mg tablets   |
| Corticosteroid | 735741000033114   | Hydrocortisone Sodium Succinate Injection 500 mg/vial   |
| Corticosteroid | 12890041000000000 | Hydrocortisone 10mg soluble tablets sugar free  |
| Corticosteroid | 6062941000033110  | Dexamethasone Solution for injection 6.6 mg/2 ml vial   |
| Corticosteroid | 10212541000000000 | Pevanti 5mg tablets (Advanz Pharma)   |
| Corticosteroid | 2146541000033110  | Dexamethasone 2mg/5ml oral solution sugar free  |
| Corticosteroid | 12398241000000000 | Dexamethasone 40mg tablets  |
| Corticosteroid | 12633541000000000 | Hydrocortisone 5mg granules in capsules for opening   |
| Corticosteroid | 131541000033113   | Betamethasone 4mg/1ml solution for injection ampoules   |
| Corticosteroid | 8141941000033110  | Hydrocortisone 5mg modified-release tablets   |
| Corticosteroid | 1131841000033110  | Prednisolone 2.5mg tablets  |
| Corticosteroid | 2509741000033110  | *Prednisolone Pills (Sucrose)   |
| Corticosteroid | 2149441000033110  | Hydrocortisone 25mg/5ml oral suspension<br>Methylprednisolone 80mg/2ml / Lidocaine 20mg/2ml (1%) suspension for injection vials |
| Corticosteroid | 3229341000033110  |   |
| Corticosteroid | 375641000033116   | Cortelan Tablets 25 mg  |
| Corticosteroid | 429541000033111   | Deltastab Tablets 5 mg  |
| Corticosteroid | 915541000033118   | Min-I-Mix Methylprednisolone Injection 0.5 g/vial   |
| Corticosteroid | 1718341000033110  | Budesonide 3mg gastro-resistant capsules  |
| Corticosteroid | 823241000033116   | Lederspan 20mg/1ml suspension for injection vials (Wyeth Pharmaceutica  |
| Corticosteroid | 12633841000000000 | Alkindi 2mg granules in capsules for opening (Diurnal Ltd)  |
| Corticosteroid | 1459041000033110  | Triamcinolone hexacetonide 100mg/5ml suspension for injection vials   |
| Corticosteroid | 732141000033116   | Hydrocortisone 0.1% topical emulsion  |
| Corticosteroid | 12633741000000000 | Alkindi 1mg granules in capsules for opening (Diurnal Ltd)  |
| Corticosteroid | 10213841000000000 | Dexamethasone 20mg/5ml oral solution sugar free   |
| Corticosteroid | 422241000033116   | Dexamethasone Injection 20 mg/ml  |
| Corticosteroid | 1119241000033110  | Prednisolone 25mg/1ml suspension for injection ampoules   |
| Corticosteroid | 1130841000033110  | Prednisolone Steaglate Tablets 6.65 mg<br>Hydrocortisone sodium phosphate 100mg/1ml solution for injection ampoules             |
| Corticosteroid | 3978341000033110  |   |
| Corticosteroid | 2372541000033110  | *Cortisone Acetate Pills (Sucrose)  |

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| Corticosteroid | 734241000033119   | Hydrocortistab 25mg/1ml suspension for injection ampoules (Advanz Pharma)   |
| Corticosteroid | 736441000033111   | Hydrocortisone acetate 25mg/1ml suspension for injection ampoules   |
| Corticosteroid | 420641000033117   | Depo-Medrone 120mg/3ml suspension for injection vials (Pfizer Ltd)  |
| Corticosteroid | 5990241000033110  | Prednisone 2mg modified-release tablets<br>Lederspan 100mg/5ml suspension for injection vials (Wyeth Pharmaceuticals)                                     |
| Corticosteroid | 821641000033119   |   |
| Corticosteroid | 10212941000000000 | Pevanti 25mg tablets (Advanz Pharma)  |
| Corticosteroid | 9870741000033110  | Dexamethasone Solution for injection 6.6 mg/2 ml ampoule  |
| Corticosteroid | 2146441000033110  | Dexsol 2mg/5ml oral solution (Rosemont Pharmaceuticals Ltd)   |
| Corticosteroid | 2509541000033110  | *Prednisolone Liquid  |
| Corticosteroid | 10988941000000000 | Prednisolone Dompe Oral solution 5 mg/5 ml unit dose  |
| Corticosteroid | 10494341000000000 | Prednisolone 10mg/ml oral solution sugar free   |
| Corticosteroid | 1127341000033110  | Prednisolone 5mg soluble tablets  |
| Corticosteroid | 899741000033118   | Medrone 2mg tablets (Pfizer Ltd)  |
| Corticosteroid | 372341000033117   | Cortisyl Tablets 25 mg  |
| Corticosteroid | 5506241000033110  | Dexamethasone 4mg tablets   |
| Corticosteroid | 8142041000033110  | Hydrocortisone 20mg modified-release tablets  |
| Corticosteroid | 6512741000033110  | Martapan 2mg/5ml oral solution (Martindale Pharmaceuticals Ltd)   |
| Corticosteroid | 1458741000033110  | Triamcinolone hexacetonide 20mg/1ml suspension for injection vials  |
| Corticosteroid | 421541000033112   | Decadron Shock-Pak Injection 20 mg/ml   |
| Corticosteroid | 12389741000000000 | Glensoludex 8mg soluble tablets (Glenmark Pharmaceuticals Europe Ltd)   |
| Corticosteroid | 420741000033114   | Depo-Medrone 80mg/2ml suspension for injection vials (Pfizer Ltd)<br>Methylprednisolone 40mg/1ml / Lidocaine 10mg/1ml (1%) suspension for injection vials |
| Corticosteroid | 3229241000033110  |   |
| Corticosteroid | 12633941000000000 | Alkindi 5mg granules in capsules for opening (Diurnal Ltd)  |
| Corticosteroid | 1130741000033110  | Prednisolone 25mg tablets   |
| Corticosteroid | 742241000033110   | Hydrocortisone 20mg tablets   |
| Corticosteroid | 3345541000033110  | Dexamethasone 4mg/1ml solution for injection ampoules   |
| Corticosteroid | 3867341000033110  | Triamcinolone acetonide 50mg/5ml suspension for injection vials   |
| Corticosteroid | 144641000033113   | Betamethasone 500microgram soluble tablets sugar free   |
| Corticosteroid | 3867241000033110  | Triamcinolone acetonide 10mg/1ml suspension for injection ampoules  |
| Corticosteroid | 5990841000033110  | Lodotra 5mg modified-release tablets (Napp Pharmaceuticals Ltd)   |
| Corticosteroid | 5900841000033110  | Dexamethasone 500micrograms/5ml oral solution<br>Kenalog Intramuscular 40mg/1ml suspension for injection pre-filled syring                                |
| Corticosteroid | 802441000033115   | (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Corticosteroid | 521541000033116   | Entocort CR 3mg capsules (Tillotts Pharma Ltd)  |
| Corticosteroid | 736341000033117   | Hydrocortisone Injection 100 mg/vial  |
| Corticosteroid | 1132041000033110  | Prednisone Tablets 1 mg   |
| Corticosteroid | 10263141000000000 | Cortiment 9mg modified-release tablets (Ferring Pharmaceuticals Ltd)  |
| Corticosteroid | 899841000033111   | Medrone 4mg tablets (Pfizer Ltd)<br>Depo-Medrone with Lidocaine suspension for injection 2ml vials (Pfizer Ltd)   |
| Corticosteroid | 421341000033117   |   |
| Corticosteroid | 131341000033118   | Betnesol 4mg/1ml solution for injection ampoules (Focus Pharmaceuticals Ltd)  |
| Corticosteroid | 8142241000033110  | Plenadren 20mg modified-release tablets (Shire Pharmaceuticals Ltd)   |
| Corticosteroid | 1601341000033110  | Deflazacort 30mg tablets  |



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| Corticosteroid | 13010341000000000 | Hydventia 20mg tablets (OcXia)  |
| Corticosteroid | 744741000033112   | Hydrocortone 20mg tablets (Auden McKenzie (Pharma Division) Ltd)  |
| Corticosteroid | 2372241000033110  | *Cortisone Acetate Granules   |
| Corticosteroid | 1830141000033110  | Hydrocortisone 5mg/5ml oral suspension<br>Kenalog Intramuscular 80mg/2ml suspension for injection pre-filled syring |
| Corticosteroid | 802541000033119   | (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Corticosteroid | 429841000033113   | Dexamethasone Tablets 250 micrograms  |
| Corticosteroid | 3345441000033110  | Dexamethasone 8mg/2ml solution for injection vials  |
| Corticosteroid | 738041000033118   | Hydrocortisone 2.5mg muco-adhesive buccal tablets sugar free  |
| Corticosteroid | 5900941000033110  | Dexamethasone 500micrograms/5ml oral suspension   |
| Corticosteroid | 431841000033111   | Dexamethasone 2mg tablets   |
| Corticosteroid | 429141000033119   | Decortisyl Tablets 5 mg<br>Depo-Medrone with Lidocaine suspension for injection 1ml vials (Pfizer                   |
| Corticosteroid | 423641000033114   | Ltd)  |
| Corticosteroid | 371941000033113   | Cortisone 25mg tablets  |
| Corticosteroid | 1119341000033110  | Prednisolone Sodium Phosphate Injection 16 mg/1 ml  |
| Corticosteroid | 1581141000033110  | Calcort 1mg tablets (Shire Pharmaceuticals Ltd)   |
| Corticosteroid | 145441000033110   | Betamethasone 500microgram tablets  |
| Corticosteroid | 2372341000033110  | *Cortisone Acetate Liquid   |
| Corticosteroid | 880141000033114   | Methylprednisolone acetate 120mg/3ml suspension for injection vials   |
| Corticosteroid | 742341000033117   | Hydrocortistab Tablets 20 mg  |
| Corticosteroid | 736541000033112   | Hydrocortisone Injection 500 mg/vial  |
| Corticosteroid | 5990141000033110  | Prednisone 1mg modified-release tablets   |
| Corticosteroid | 9119141000033110  | Prednisolone 15mg/5ml oral solution   |
| Corticosteroid | 6512141000033110  | Budenofalk 9mg gastro-resistant granules sachets (Dr. Falk Pharma UK Lt   |
| Corticosteroid | 431941000033115   | Dexamethasone 500microgram tablets  |
| Corticosteroid | 1137141000033110  | Precortisyl Tablets 5 mg  |
| Corticosteroid | 12568641000000000 | Dexamethasone (base) 3.3mg/1ml solution for injection ampoules  |
| Corticosteroid | 12633441000000000 | Hydrocortisone 2mg granules in capsules for opening   |
| Corticosteroid | 372041000033119   | Cortisone Tablets 5 mg  |
| Corticosteroid | 375741000033113   | Cortisone Acetate Tablets 25 mg   |
| Corticosteroid | 10212441000000000 | Pevanti 2.5mg tablets (Advanz Pharma)   |
| Corticosteroid | 2958641000033110  | Dexamethasone Phosphate Injection 24 mg/ml, 5 ml vial   |
| Corticosteroid | 1137041000033110  | Precortisyl Tablets 1 mg  |
| Corticosteroid | 898541000033119   | Methylprednisolone 100mg tablets  |
| Corticosteroid | 11072141000000000 | Dexamethasone 2mg soluble tablets sugar free  |
| Corticosteroid | 428941000033110   | Deflazacort 6mg tablets   |
| Corticosteroid | 2509341000033110  | *Prednisolone Tablets   |
| Corticosteroid | 886141000033111   | Methylprednisolone Acetate Injection 10 mg/1 ml   |
| Corticosteroid | 9402441000033110  | Beclometasone 0.0025% in White soft paraffin  |
| Corticosteroid | 4214141000033110  | Clipper 5mg gastro-resistant modified-release tablets (Chiesi Ltd)  |
| Corticosteroid | 5990741000033110  | Lodotra 2mg modified-release tablets (Napp Pharmaceuticals Ltd)   |
| Corticosteroid | 431641000033110   | Deltacortril 5mg gastro-resistant tablets (Phoenix Labs Ltd)  |
| Corticosteroid | 210841000033110   | Calcort 6mg tablets (Sanofi)  |
| Corticosteroid | 12633641000000000 | Alkindi 0.5mg granules in capsules for opening (Diurnal Ltd)  |
| Corticosteroid | 372241000033110   | Cortistab Tablets 5 mg  |

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| Corticosteroid  | 3978541000033110  | Efcortisol 100mg/1ml solution for injection ampoules (Advanz Pharma)  |
| Corticosteroid  | 3867441000033110  | Adcortyl Intra-articular / Intradermal 10mg/1ml suspension for injection ampoules (Bristol-Myers Squibb Pharmaceuticals Ltd)              |
| Corticosteroid  | 8494441000033110  | Dilacort 2.5mg gastro-resistant tablets (Crescent Pharma Ltd)   |
| Corticosteroid  | 904241000033116   | Methylprednisolone 4mg tablets  |
| Corticosteroid  | 11072341000000000 | Dexamethasone 8mg soluble tablets sugar free  |
| Corticosteroid  | 10212141000000000 | Prednisolone 10mg tablets   |
| Corticosteroid  | 8142141000033110  | Plenadren 5mg modified-release tablets (Shire Pharmaceuticals Ltd)  |
| Corticosteroid  | 12575941000000000 | Dexamethasone 8mg tablets   |
| Corticosteroid  | 744541000033116   | Hydrocortisone 10mg tablets   |
| Corticosteroid  | 11664841000000000 | Prednisolone 30mg tablets   |
| Corticosteroid  | 8494541000033110  | Dilacort 5mg gastro-resistant tablets (Crescent Pharma Ltd)   |
| Corticosteroid  | 12568741000000000 | Dexamethasone (base) 3.8mg/1ml solution for injection vials   |
| Corticosteroid  | 744641000033115   | Hydrocortone 10mg tablets (Auden McKenzie (Pharma Division) Ltd)  |
| Corticosteroid  | 1114241000033110  | Prednisolone 2.5mg gastro-resistant tablets   |
| Corticosteroid  | 899641000033110   | Medrone 16mg tablets (Pfizer Ltd)   |
| Corticosteroid  | 1581041000033110  | Calcort 30mg tablets (Shire Pharmaceuticals Ltd)  |
| Corticosteroid  | 2760741000033110  | Dexamethasone Injection 5 mg/ml, 1 ml ampoule   |
| Corticosteroid  | 880041000033110   | Methylprednisolone Sodium Succinate Injection 500 mg/vial   |
| Corticosteroid  | 5989241000033110  | Dexamethasone Solution for injection 3.3 mg/ml, 1 ml ampoule<br>Hydrocortisone sodium phosphate 500mg/5ml solution for injection ampoules |
| Corticosteroid  | 3978441000033110  | Dexamethasone Solution for injection 3.8 mg/1 ml vial   |
| Corticosteroid  | 880241000033119   | Methylprednisolone acetate 80mg/2ml suspension for injection vials  |
| Fluoroquinolone | 10220241000000000 | Evoxil 500mg tablets (Kent Pharmaceuticals Ltd)   |
| Fluoroquinolone | 1582841000033110  | Ciproxin 250mg/5ml oral suspension (Bayer Plc)  |
| Fluoroquinolone | 9290241000033110  | Ofloxacin 200mg/100ml solution for infusion bottles   |
| Fluoroquinolone | 253541000033110   | Ciproxin 200mg/100ml solution for infusion bottles (Bayer Plc)  |
| Fluoroquinolone | 258941000033112   | Ciproxin 750mg tablets (Bayer Plc)  |
| Fluoroquinolone | 986441000033114   | Norfloxacin 400mg tablets   |
| Fluoroquinolone | 5454241000033110  | Moxifloxacin 400mg/250ml solution for infusion bottles  |
| Fluoroquinolone | 1409341000033110  | Tarivid 200mg tablets (Sanofi)  |
| Fluoroquinolone | 254441000033111   | Ciproxin I.V. Flexibag 200mg/100ml infusion (Bayer Plc)   |
| Fluoroquinolone | 6427241000033110  | Levofloxacin 500mg/100ml infusion bags  |
| Fluoroquinolone | 1626141000033110  | Levofloxacin 500mg/100ml solution for infusion vials  |
| Fluoroquinolone | 253841000033112   | Ciprofloxacin 400mg/200ml solution for infusion bottles   |
| Fluoroquinolone | 6427141000033110  | Evoxil 250mg tablets (Beacon Pharmaceuticals Ltd)   |
| Fluoroquinolone | 1002641000033110  | Ofloxacin 400mg tablets   |
| Fluoroquinolone | 11524841000000000 | Levofloxacin 100mg/ml nebuliser liquid ampoules   |
| Fluoroquinolone | 1698741000033110  | Tavanic 250mg tablets (Sanofi)  |
| Fluoroquinolone | 1626341000033110  | Levofloxacin 500mg tablets  |
| Fluoroquinolone | 4024241000033110  | Tarivid Iv Solution for injection 400 mg/200 ml bottle  |
| Fluoroquinolone | 1582941000033110  | Ciprofloxacin 250mg/5ml oral suspension   |
| Fluoroquinolone | 1626241000033110  | Levofloxacin 250mg tablets  |
| Fluoroquinolone | 4024141000033110  | Ofloxacin Solution for injection 400 mg/200 ml bottle   |
| Fluoroquinolone | 4039841000033110  | Ciprofloxacin 400mg/200ml solution for infusion vials   |

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| Fluoroquinolone | 1002341000033110  | Ofloxacin Intravenous infusion 2 mg/ml  |
| Fluoroquinolone | 1407541000033110  | Tarivid 400mg tablets (Sanofi)  |
| Fluoroquinolone | 1002541000033110  | Ofloxacin 200mg tablets   |
| Fluoroquinolone | 9290341000033110  | Tarivid 200mg/100ml solution for infusion bottles (Sanofi)  |
| Fluoroquinolone | 8618641000033110  | Levofloxacin 500mg/100ml solution for infusion bottles  |
| Fluoroquinolone | 254241000033110   | Ciprofloxacin 200mg/100ml infusion bags   |
| Fluoroquinolone | 254341000033117   | Ciprofloxacin 400mg/200ml infusion bags   |
| Fluoroquinolone | 255641000033112   | Ciprofloxacin 100mg/50ml solution for infusion bottles  |
| Fluoroquinolone | 2890341000033110  | Avelox 400mg tablets (Bayer Plc)  |
| Fluoroquinolone | 1698841000033110  | Tavanic 500mg tablets (Sanofi)  |
| Fluoroquinolone | 255341000033116   | Ciproxin 100mg/50ml solution for infusion bottles (Bayer Plc)   |
| Fluoroquinolone | 260241000033112   | Ciprofloxacin 250mg tablets   |
| Fluoroquinolone | 5052541000033110  | Ciprofloxacin 100mg/50ml solution for infusion vials  |
| Fluoroquinolone | 4039741000033110  | Ciprofloxacin 200mg/100ml solution for infusion vials   |
| Fluoroquinolone | 259641000033114   | Ciproxin 250mg tablets (Bayer Plc)  |
| Fluoroquinolone | 254541000033112   | Ciproxin I.V. Flexibag 400mg/200ml infusion (Bayer Plc)   |
| Fluoroquinolone | 259441000033112   | Ciproxin 100mg tablets (Bayer Plc)  |
| Fluoroquinolone | 2890241000033110  | Moxifloxacin 400mg tablets  |
| Fluoroquinolone | 5454341000033110  | Avelox 400mg/250ml solution for infusion bottles (Bayer Plc)  |
| Fluoroquinolone | 259341000033118   | Ciprofloxacin 100mg tablets   |
| Fluoroquinolone | 1405041000033110  | Tarivid Intravenous infusion 2 mg/ml  |
| Fluoroquinolone | 11525041000000000 | Quinsair 240mg nebuliser solution ampoules (Chiesi Ltd)   |
| Fluoroquinolone | 1496041000033110  | Utinor 400mg tablets (Organon Pharma (UK) Ltd)  |
| Fluoroquinolone | 253641000033111   | Ciproxin 400mg/200ml solution for infusion bottles (Bayer Plc)  |
| Fluoroquinolone | 1698641000033110  | Tavanic 500mg/100ml solution for infusion vials (Sanofi)  |
| Fluoroquinolone | 253741000033119   | Ciprofloxacin 200mg/100ml solution for infusion bottles   |
| Fluoroquinolone | 258741000033114   | Ciproxin 500mg tablets (Bayer Plc)<br>Evoxil 500mg/100ml solution for infusion vials (Beacon Pharmaceuticals Ltd) |
| Fluoroquinolone | 6427941000033110  |   |
| Fluoroquinolone | 259041000033115   | Ciprofloxacin 750mg tablets   |
| Fluoroquinolone | 258841000033116   | Ciprofloxacin 500mg tablets   |
| Metronidazole   | 897941000033114   | Metronidazole 200mg tablets   |
| Metronidazole   | 879541000033117   | Metronidazole Intravenous infusion 5 mg/ml  |
| Metronidazole   | 593141000033115   | Flagyl 400mg tablets (Sanofi)   |
| Metronidazole   | 900941000033117   | Metrolyl Tablets 200 mg   |
| Metronidazole   | 596441000033115   | Flagyl Compak (Hawgreen Ltd)  |
| Metronidazole   | 898041000033112   | Metronidazole 400mg tablets   |
| Metronidazole   | 892441000033118   | Metronidazole 500mg suppositories   |
| Metronidazole   | 5331441000033110  | Metronidazole Tablets 250 mg  |
| Metronidazole   | 593041000033119   | Flagyl 200mg tablets (Sanofi)   |
| Metronidazole   | 584041000033117   | Flagyl Intravenous infusion 5 mg/ml   |
| Metronidazole   | 592041000033111   | Flagyl-S 200mg/5ml oral suspension (Zentiva)  |
| Metronidazole   | 2923541000033110  | Metronidazole 500mg/100ml infusion 100ml bags   |
| Metronidazole   | 891941000033116   | Metronidazole 100mg/5ml oral suspension   |
| Metronidazole   | 12356041000000000 | Metronidazole 500mg/100ml solution for infusion bottles   |

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| Metronidazole  | 591941000033117   | Flagyl 500mg suppositories (Sanofi)                            |
| Metronidazole  | 2923641000033110  | Flagyl 500mg/100ml infusion 100ml bags (Baxter Healthcare Ltd) |
| Metronidazole  | 899441000033113   | Metronidazole 500mg tablets                                    |
| Metronidazole  | 592241000033115   | Flagyl 1g suppositories (Sanofi)                               |
| Metronidazole  | 892741000033113   | Metrolyl 1g suppositories (Sandoz Ltd)                         |
| Metronidazole  | 885141000033116   | Metrolyl Intravenous infusion 5 mg/ml, 100 ml bag              |
| Metronidazole  | 2923441000033110  | Metronidazole 100mg/20ml solution for infusion ampoules        |
| Metronidazole  | 893041000033118   | Metronidazole 1g suppositories                                 |
| Metronidazole  | 893141000033119   | Metronidazole 200mg/5ml oral suspension                        |
| Metronidazole  | 892841000033115   | Metrolyl 500mg suppositories (Sandoz Ltd)                      |
| Metronidazole  | 901041000033110   | Metrolyl Tablets 400 mg  |
| Nitrofurantoin | 857841000033111   | Macrochantin 100mg capsules (Advanz Pharma)                    |
| Nitrofurantoin | 11603941000000000 | Genfura 100mg tablets (Genesis Pharmaceuticals Ltd)            |
| Nitrofurantoin | 619141000033114   | Furadantin 100mg tablets (Advanz Pharma)                       |
| Nitrofurantoin | 968141000033115   | Nitrofurantoin 50mg capsules                                   |
| Nitrofurantoin | 11604041000000000 | Genfura 50mg tablets (Genesis Pharmaceuticals Ltd)             |
| Nitrofurantoin | 619241000033119   | Furadantin 50mg tablets (Advanz Pharma)                        |
| Nitrofurantoin | 967941000033117   | Nitrofurantoin 100mg capsules                                  |
| Nitrofurantoin | 975541000033110   | Nitrofurantoin 50mg tablets                                    |
| Nitrofurantoin | 971641000033114   | Nitrofurantoin 100mg modified-release capsules                 |
| Nitrofurantoin | 618541000033112   | Furadantin 25mg/5ml oral suspension (Mercury Pharma Group Ltd) |
| Nitrofurantoin | 5997241000033110  | Nitrofurantoin 25mg/5ml oral suspension                        |
| Nitrofurantoin | 863441000033113   | Macrobid 100mg modified-release capsules (Advanz Pharma)       |
| Nitrofurantoin | 1495641000033110  | Urantoine 50mg tablets (Dr Reddy's Laboratories (UK) Ltd)      |
| Nitrofurantoin | 5997141000033110  | Nitrofurantoin 25mg/5ml oral solution                          |
| Nitrofurantoin | 975441000033114   | Nitrofurantoin 100mg tablets                                   |
| Nitrofurantoin | 2955441000033110  | Urantoine 100mg tablets (Dr Reddy's Laboratories (UK) Ltd)     |
| Nitrofurantoin | 857941000033115   | Macrochantin 50mg capsules (Advanz Pharma)                     |
| Nitrofurantoin | 974441000033110   | Nitrofurantoin 25mg/5ml oral suspension sugar free             |
| Phenytoin      | 1065741000033110  | Pentran Tablets 100 mg   |
| Phenytoin      | 524941000033112   | Epanutin 50mg capsules (Pfizer Ltd)                            |
| Phenytoin      | 1065841000033110  | Pentran Tablets 50 mg  |
| Phenytoin      | 1068941000033110  | Phenytoin sodium 25mg capsules                                 |
| Phenytoin      | 1082941000033110  | Phenytoin Tablets 50 mg  |
| Phenytoin      | 8124641000033110  | Phenytoin sodium 25mg capsules (Flynn Pharma Ltd)              |
| Phenytoin      | 1069041000033110  | Phenytoin sodium 50mg capsules                                 |
| Phenytoin      | 8124741000033110  | Phenytoin sodium 50mg capsules (Flynn Pharma Ltd)              |
| Phenytoin      | 524741000033114   | Epanutin 100mg capsules (Pfizer Ltd)                           |
| Phenytoin      | 5887341000033110  | Phenytoin 90mg/5ml oral solution                               |
| Phenytoin      | 1082141000033110  | Phenytoin sodium 100mg tablets                                 |
| Phenytoin      | 525041000033112   | Epanutin 300mg capsules (Pfizer Ltd)                           |
| Phenytoin      | 13765041000000000 | Phenytoin sodium 100mg capsules (Accord Healthcare Ltd)        |
| Phenytoin      | 9109441000033110  | Phenytoin Sodium (Nrim) Capsules 100 mg                        |
| Phenytoin      | 524841000033116   | Epanutin 25mg capsules (Pfizer Ltd)                            |
| Phenytoin      | 11717841000000000 | Phenytoin sodium 100mg tablets (Teva UK Ltd)                   |

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| Phenytoin    | 13091441000000000 | Dilantin Infatabs 50mg chewable tablets (Imported (Canada))   |
| Phenytoin    | 1082841000033110  | Phenytoin Tablets 100 mg  |
| Phenytoin    | 528941000033118   | Epanutin Ready Mixed Parenteral Injection 50mg/ml   |
| Phenytoin    | 1068841000033110  | Phenytoin sodium 100mg capsules   |
| Phenytoin    | 8124841000033110  | Phenytoin sodium 100mg capsules (Flynn Pharma Ltd)  |
| Phenytoin    | 1870841000033110  | Phenytoin 30mg/5ml oral suspension  |
| Phenytoin    | 1068641000033110  | Phenytoin sodium 300mg capsules   |
| Phenytoin    | 1074641000033110  | Phenytoin 50mg chewable tablets   |
| Phenytoin    | 1077141000033110  | Phenytoin S/f suspension 90 mg/5 ml   |
| Phenytoin    | 531941000033113   | Epanutin 30mg/5ml oral suspension (Upjohn UK Ltd)   |
| Phenytoin    | 529441000033118   | Epanutin Infatabs 50mg chewable tablets (Upjohn UK Ltd)   |
| Phenytoin    | 1070741000033110  | Phenytoin Sodium Chewable tablets 50 mg   |
| Phenytoin    | 1082541000033110  | Phenytoin sodium 50mg tablets   |
| Phenytoin    | 1077941000033110  | Phenytoin Sodium Suspension 30 mg/5 ml  |
| Phenytoin    | 5887441000033110  | Phenytoin 90mg/5ml oral suspension<br>Epanutin Ready-Mixed Parenteral 250mg/5ml solution for injection ampoules (Upjohn UK Ltd) |
| Phenytoin    | 526941000033119   | Phenytoin Sodium (Actavis) Capsules 100 mg  |
| Phenytoin    | 10714041000000000 | Phenytoin sodium 250mg/5ml solution for injection ampoules  |
| Phenytoin    | 1074441000033110  | Phenytoin sodium 300mg capsules (Flynn Pharma Ltd)  |
| Trimethoprim | 8124941000033110  | Trimopan Suspension 50 mg/5 ml  |
| Trimethoprim | 1467441000033110  | Trimethoprim Paediatric suspension Sugar Free 50 mg/5 ml  |
| Trimethoprim | 1464441000033110  | Monotrim 50mg/5ml oral suspension (Chemidex Pharma Ltd)   |
| Trimethoprim | 933741000033116   | Trimethoprim Tablets 300 mg   |
| Trimethoprim | 1474441000033110  | Trimogal 200mg tablets (Ennogen Pharma Ltd)   |
| Trimethoprim | 1472741000033110  | Monotrim 100mg tablets (Abbott Healthcare Products Ltd)   |
| Trimethoprim | 936041000033112   | Trimethoprim Mixture Sugar Free 50 mg/5 ml  |
| Trimethoprim | 1463141000033110  | Trimethoprim 200mg tablets  |
| Trimethoprim | 1471241000033110  | Trimogal 100mg tablets (Ennogen Pharma Ltd)   |
| Trimethoprim | 1472641000033110  | Trimethoprim 100mg tablets  |
| Trimethoprim | 1471141000033110  | Monotrim 200mg tablets (Abbott Healthcare Products Ltd)   |
| Trimethoprim | 936141000033111   | Trimethoprim 50mg/5ml oral suspension sugar free  |
| Trimethoprim | 1467541000033110  | Trimethoprim 100mg/5ml solution for injection ampoules  |
| Trimethoprim | 1460641000033110  | Ipral Paediatric suspension 50 mg/5 ml  |
| Trimethoprim | 774041000033113   | Trimopan 100mg tablets (Teva UK Ltd)  |
| Trimethoprim | 1472841000033110  | Ipral Tablets 100 mg  |
| Trimethoprim | 774141000033112   | Trimopan 200mg tablets (Teva UK Ltd)  |
| Trimethoprim | 1472941000033110  | Monotrim 100mg/5ml solution for injection ampoules (Abbott Healthcare Products Ltd)   |
| Trimethoprim | 928541000033118   | Ipral Tablets 200 mg  |
| Trimethoprim | 774241000033117   |   |

### Drug code lists in GOLD

| <b>Drug</b>   | <b>prodcode</b> | <b>Description</b>   |
|---------------|-----------------|--|
| Cephalosporin | 31110           | Keflex 500mg tablets (Flynn Pharma Ltd)  |
| Cephalosporin | 74202           | Cefuroxime 250mg powder for injection vials (Bowmed Ibisqus Ltd)   |
| Cephalosporin | 75579           | Cefalexin 250mg/5ml Oral solution (Lagap)  |
| Cephalosporin | 55895           | Ceftriaxone 1g powder for solution for injection vials (PLIVA Pharma Ltd)  |
| Cephalosporin | 14607           | Cefaclor 125mg/5ml Liquid (Lagap)  |
| Cephalosporin | 62188           | Cefalexin 250mg capsules (Phoenix Healthcare Distribution Ltd)   |
| Cephalosporin | 14540           | Cefadroxil 500mg/5ml oral suspension   |
| Cephalosporin | 55211           | Cefaclor 500mg capsules (Kent Pharmaceuticals Ltd)   |
| Cephalosporin | 19144           | Cefalexin 125mg/5ml oral suspension sugar free (Teva UK Ltd)   |
| Cephalosporin | 12276           | Keflex 500mg Capsule (Eli Lilly and Company Ltd)   |
| Cephalosporin | 21835           | Kiflone 250mg Capsule (Berk Pharmaceuticals Ltd)   |
| Cephalosporin | 69472           | Cefalexin 500mg capsules (Lupin Healthcare (UK) Ltd)   |
| Cephalosporin | 19138           | Cefalexin 500mg capsules (Actavis UK Ltd)  |
| Cephalosporin | 18243           | Distaclor 500mg capsules (Flynn Pharma Ltd)  |
| Cephalosporin | 62898           | Cefalexin 125mg/5ml oral suspension sugar free (PLIVA Pharma Ltd)  |
| Cephalosporin | 43245           | CEFSULODIN SODIUM & LIGNOCAINE 0.5% 1 GM INJ   |
| Cephalosporin | 43433           | Cefradine 250mg capsules (Teva UK Ltd)   |
| Cephalosporin | 44299           | Cefradine 250mg capsules (Kent Pharmaceuticals Ltd)  |
| Cephalosporin | 2227            | Cefalexin 500mg/5ml oral suspension  |
| Cephalosporin | 7508            | Cefoxitin 1g powder for solution for injection vials   |
| Cephalosporin | 7503            | Cefuroxime (as sodium salt) 1.5g/vial infusion   |
| Cephalosporin | 32221           | Kefadim 2g Injection (Eli Lilly and Company Ltd)   |
| Cephalosporin | 41192           | Cefalexin 250mg/5ml oral suspension (Ranbaxy (UK) Ltd)   |
| Cephalosporin | 25666           | Cefuroxime with Saline 750mg infusion  |
| Cephalosporin | 65072           | Cefalexin 250mg/5ml oral suspension (Mawdsley-Brooks & Company Ltd)  |
| Cephalosporin | 67746           | Cefalexin 500mg tablets (PLIVA Pharma Ltd)   |
| Cephalosporin | 65990           | Cefaclor 250mg/5ml oral suspension sugar free (Teva UK Ltd)  |
| Cephalosporin | 29202           | Cefalexin 500mg tablets (A A H Pharmaceuticals Ltd)<br>Cefalexin 125mg/5ml oral suspension sugar free (Alliance Healthcare (Distribution) Ltd) |
| Cephalosporin | 74893           |  |
| Cephalosporin | 74060           | Cefalexin 125mg/5ml oral suspension (Dowelhurst Ltd)   |
| Cephalosporin | 37857           | Cefuroxime 1.5g with 500mg infusion  |
| Cephalosporin | 72224           | Cefalexin 125mg/5ml oral suspension sugar free (Milpharm Ltd)  |
| Cephalosporin | 78007           | Ceftriaxone 2g powder for solution for injection vials (Stravencon Ltd)  |
| Cephalosporin | 6651            | Cefalexin 125mg/5ml oral suspension sugar free   |
| Cephalosporin | 7510            | Cefpodoxime 40mg/5ml oral suspension   |
| Cephalosporin | 14749           | Ceftazidime 2g/vial powder for injection solution  |
| Cephalosporin | 67792           | Cefaclor 250mg/5ml oral suspension (Mylan)   |
| Cephalosporin | 1384            | Cefalexin 125mg/5ml suspension   |
| Cephalosporin | 22042           | Distaclor 250mg/5ml oral suspension (Flynn Pharma Ltd)   |
| Cephalosporin | 52282           | Cefalexin 250mg capsules (Milpharm Ltd)  |
| Cephalosporin | 33802           | Cefalexin 250mg Capsule (Berk Pharmaceuticals Ltd)   |

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| Cephalosporin | 17873 | Fortum 1g powder for solution for injection vials (GlaxoSmithKline UK Ltd)  |
| Cephalosporin | 9698  | Cefalexin 250mg tablets (Teva UK Ltd)   |
| Cephalosporin | 67770 | Cefaclor 250mg capsules (Focus Pharmaceuticals Ltd)<br>Velosef 1g powder for solution for injection vials (Bristol-Myers Squibb<br>Pharmaceuticals Ltd)                       |
| Cephalosporin | 23779 | Pharmaceuticals Ltd)  |
| Cephalosporin | 3609  | Ceporex 125mg/5ml Oral solution (Galen Ltd)   |
| Cephalosporin | 36578 | Cefalexin 125mg/5ml oral suspension (Ranbaxy (UK) Ltd)  |
| Cephalosporin | 60039 | Cefalexin 250mg capsules (Waymade Healthcare Plc)   |
| Cephalosporin | 58525 | Ceftriaxone 2g powder for solution for infusion vials   |
| Cephalosporin | 24661 | Kefadol 1g powder for solution for injection vials (Dista Products Ltd)   |
| Cephalosporin | 7506  | Cefodizime 1g/vial injection  |
| Cephalosporin | 58623 | Cefuroxime 250mg tablets (Alliance Healthcare (Distribution) Ltd)   |
| Cephalosporin | 39703 | Cefaclor 125mg/5ml oral suspension (A A H Pharmaceuticals Ltd)  |
| Cephalosporin | 19184 | Cefalexin 500mg capsules (Mylan)  |
| Cephalosporin | 80369 | Cefradine 250mg capsules (Sigma Pharmaceuticals Plc)  |
| Cephalosporin | 4689  | Cefaclor 500mg Capsule (Lagap)  |
| Cephalosporin | 77667 | Cefuroxime 250mg tablets (DE Pharmaceuticals)   |
| Cephalosporin | 30771 | Cefaclor 500mg capsules (Ranbaxy (UK) Ltd)  |
| Cephalosporin | 30772 | Cefaclor 250mg capsules (Ranbaxy (UK) Ltd)  |
| Cephalosporin | 59068 | Cefuroxime 250mg tablets (Teva UK Ltd)  |
| Cephalosporin | 12248 | Cefalexin 125mg/1.25ml paediatric drops   |
| Cephalosporin | 33334 | Cefalexin 250mg tablets (A A H Pharmaceuticals Ltd)   |
| Cephalosporin | 1860  | Cefalexin 250mg/5ml oral suspension   |
| Cephalosporin | 7505  | Cefamandole 1g powder for solution for injection vials  |
| Cephalosporin | 58463 | Cefuroxime 250mg tablets (Sandoz Ltd)   |
| Cephalosporin | 17871 | Fortum 500mg powder for solution for injection vials (GlaxoSmithKline UK Ltd)   |
| Cephalosporin | 8625  | Ceporex 250mg/5ml Liquid (Galen Ltd)  |
| Cephalosporin | 47993 | Cefuroxime (as axetil) 500mg tablets  |
| Cephalosporin | 82119 | Ceftriaxone 1g powder for solution for injection vials (Panpharma UK Ltd)   |
| Cephalosporin | 1110  | Cefixime 100mg/5ml oral suspension  |
| Cephalosporin | 41106 | Ceporex 125mg/5ml syrup (Strides Pharma UK Ltd)   |
| Cephalosporin | 40914 | Ceporex 500mg tablets (Strides Pharma UK Ltd)   |
| Cephalosporin | 32235 | Cefaclor 125mg/5ml oral suspension (Ranbaxy (UK) Ltd)   |
| Cephalosporin | 77241 | Ceftazidime 500mg powder for solution for injection vials (Bowmed Ibisqus Ltd)  |
| Cephalosporin | 41394 | Cefotaxime 500mg/vial Injection (C P Pharmaceuticals Ltd)   |
| Cephalosporin | 41825 | Cefalexin 250mg/5ml Oral solution (C P Pharmaceuticals Ltd)   |
| Cephalosporin | 16983 | Cefradine 1g powder for solution for injection vials  |
| Cephalosporin | 366   | Cefaclor 250mg capsules   |
| Cephalosporin | 25667 | Zinacef 1.5g/vial Infusion (Glaxo Laboratories Ltd)   |
| Cephalosporin | 22321 | Cefalexin 500mg tablets (Mylan)   |
| Cephalosporin | 9690  | Cefalexin 250mg capsules (Teva UK Ltd)  |
| Cephalosporin | 3180  | Cefaclor 375mg modified-release tablets   |
| Cephalosporin | 67606 | Ceftizoxime 1000mg/vial injection   |
| Cephalosporin | 59708 | Ceftriaxone 1g powder for solution for injection vials (Genus Pharmaceuticals Ltd)<br>Cefotaxime 500mg powder for solution for injection vials (Genus Pharmaceuticals<br>Ltd) |
| Cephalosporin | 57842 | Ltd)  |

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| Cephalosporin | 77916 | Cefalexin 500mg capsules (DE Pharmaceuticals)                                      |
| Cephalosporin | 61470 | Ceftaroline fosamil 600mg powder for solution for infusion vials                   |
| Cephalosporin | 14420 | KEFLEX 500 MG INJ  |
| Cephalosporin | 66852 | Ceftazidime 2g powder for solution for injection vials (A A H Pharmaceuticals Ltd) |
| Cephalosporin | 684   | Ceftriaxone 1g powder for solution for injection vials                             |
| Cephalosporin | 59069 | Cefalexin 250mg tablets (Phoenix Healthcare Distribution Ltd)                      |
| Cephalosporin | 31825 | Cefalexin 250mg tablets (IVAX Pharmaceuticals UK Ltd)                              |
| Cephalosporin | 36569 | Cefalexin 500mg capsules (Kent Pharmaceuticals Ltd)                                |
| Cephalosporin | 29464 | Cefalexin 250mg/5ml oral suspension (Mylan)  |
| Cephalosporin | 71271 | Ceftazidime 2g powder for solution for injection vials (Stravencon Ltd)            |
| Cephalosporin | 1038  | Cefaclor 125mg/5ml oral suspension   |
| Cephalosporin | 3704  | Ceftriaxone 250mg powder for solution for injection vials                          |
| Cephalosporin | 42070 | Kefadim 1g powder for solution for injection vials (Flynn Pharma Ltd)              |
| Cephalosporin | 9664  | Cefalexin 500mg capsules (IVAX Pharmaceuticals UK Ltd)                             |
| Cephalosporin | 11992 | Baxan 500mg capsules (Bristol-Myers Squibb Pharmaceuticals Ltd)                    |
| Cephalosporin | 7509  | Ceftibuten 400mg capsules  |
| Cephalosporin | 18313 | CEFTAZIDIME INTERMATE inf DEVICE   |
| Cephalosporin | 31000 | Kefadim 1g Injection (Eli Lilly and Company Ltd)                                   |
| Cephalosporin | 19838 | Ceftriaxone 2g powder for solution for injection vials                             |
| Cephalosporin | 74505 | Cefalexin 500mg capsules (Sigma Pharmaceuticals Plc)                               |
| Cephalosporin | 68444 | Fortum 2g powder for solution for injection vials (GlaxoSmithKline UK Ltd)         |
| Cephalosporin | 72784 | Cefotaxime 1g powder for solution for injection vials (Wockhardt UK Ltd)           |
| Cephalosporin | 41049 | Ceporex 250mg tablets (Strides Pharma UK Ltd)                                      |
| Cephalosporin | 32642 | Cefalexin 125mg/5ml oral suspension (Kent Pharmaceuticals Ltd)                     |
| Cephalosporin | 12496 | Baxan 250mg/5ml oral suspension (Bristol-Myers Squibb Pharmaceuticals Ltd)         |
| Cephalosporin | 36667 | Kefadim 2g Infusion (Eli Lilly and Company Ltd)                                    |
| Cephalosporin | 28054 | Zinacef 250mg powder for injection vials (GlaxoSmithKline UK Ltd)                  |
| Cephalosporin | 18702 | Orelox 100mg tablets (Sanofi)  |
| Cephalosporin | 78824 | Cefaclor 500mg capsules (Phoenix Healthcare Distribution Ltd)                      |
| Cephalosporin | 5859  | Ceporex 500mg/5ml Oral solution (Galen Ltd)  |
| Cephalosporin | 40747 | Cefalexin 250mg chewable tablets   |
| Cephalosporin | 34133 | Cefalexin 250mg/5ml oral suspension sugar free (Teva UK Ltd)                       |
| Cephalosporin | 18995 | LATAMOXEF SODIUM 500 MG INJ  |
| Cephalosporin | 19160 | Cefalexin 250mg capsules (Mylan)   |
| Cephalosporin | 28053 | CEFTIZOXIME SODIUM 1 GM INJ  |
| Cephalosporin | 26233 | Keftid 125mg/5ml oral suspension (Strides Pharma UK Ltd)                           |
| Cephalosporin | 8127  | Cedax 400mg Capsule (Schering-Plough Ltd)  |
| Cephalosporin | 7560  | Ceporex 125mg/5ml Liquid (Galen Ltd)   |
| Cephalosporin | 6671  | Cefalexin 250mg/5ml oral suspension sugar free                                     |
| Cephalosporin | 20420 | Cefaclor 250mg/5ml Liquid (Generics (UK) Ltd)                                      |
| Cephalosporin | 66349 | Cefalexin 500mg/5ml oral suspension (Waymade Healthcare Plc)                       |
| Cephalosporin | 27254 | Tenkorex 500mg Capsule (OPD Pharm)   |
| Cephalosporin | 9603  | Keflex 500mg Tablet (Eli Lilly and Company Ltd)                                    |
| Cephalosporin | 21842 | Cedax 36mg/ml Liquid (Schering-Plough Ltd)   |
| Cephalosporin | 8051  | Cefaclor 500mg modified-release tablets  |



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| Cephalosporin | 52179 | Cefadroxil 500mg capsules (Phoenix Healthcare Distribution Ltd)   |
| Cephalosporin | 27017 | Kiflone 500mg Capsule (Berk Pharmaceuticals Ltd)  |
| Cephalosporin | 26236 | Keftid 500mg capsules (Strides Pharma UK Ltd)   |
| Cephalosporin | 41853 | Keftid 250mg/5ml oral suspension (Strides Pharma UK Ltd)  |
| Cephalosporin | 25953 | Kefadol 500mg/vial Injection (Dista Products Ltd)   |
| Cephalosporin | 67794 | Cefalexin 250mg/5ml oral suspension (Alliance Healthcare (Distribution) Ltd)  |
| Cephalosporin | 12850 | Cefuroxime 125mg tablets  |
| Cephalosporin | 26042 | Rocephin 250mg powder for solution for injection vials (Roche Products Ltd)   |
| Cephalosporin | 62640 | Cefaclor 250mg capsules (Teva UK Ltd)   |
| Cephalosporin | 34629 | Cefradine 500mg capsules (Mylan)  |
| Cephalosporin | 55877 | Ceftazidime 2g powder for solution for injection vials (Genus Pharmaceuticals Ltd)  |
| Cephalosporin | 1146  | Cefalexin 250mg tablets   |
| Cephalosporin | 7430  | Keflex 250mg Capsule (Eli Lilly and Company Ltd)  |
| Cephalosporin | 565   | Cefradine 250mg capsules  |
| Cephalosporin | 52851 | Cefalexin 500mg capsules (Alliance Healthcare (Distribution) Ltd)   |
| Cephalosporin | 20003 | Ceftazidime 3g powder for solution for injection vials<br>Ceftazidime 500mg powder for solution for injection vials (Genus Pharmaceuticals Ltd)               |
| Cephalosporin | 58806 | Ltd)  |
| Cephalosporin | 20881 | Cefaclor 375mg modified-release tablets (Ranbaxy (UK) Ltd)  |
| Cephalosporin | 74637 | Cefalexin 250mg tablets (Ranbaxy (UK) Ltd)  |
| Cephalosporin | 77752 | Cefalexin 125mg/5ml oral suspension (Phoenix Healthcare Distribution Ltd)   |
| Cephalosporin | 67828 | Cefalexin 500mg capsules (Phoenix Healthcare Distribution Ltd)  |
| Cephalosporin | 80857 | Cefalexin 500mg/5ml oral suspension (Kent Pharmaceuticals Ltd)  |
| Cephalosporin | 82460 | Cefaclor 375mg modified-release tablets (Kent Pharmaceuticals Ltd)<br>Cefalexin 250mg/5ml oral suspension sugar free (Alliance Healthcare (Distribution) Ltd) |
| Cephalosporin | 75386 | Ltd)  |
| Cephalosporin | 34654 | Cefradine 500mg capsules (Teva UK Ltd)  |
| Cephalosporin | 26207 | Keftid 250mg capsules (Strides Pharma UK Ltd)   |
| Cephalosporin | 12235 | Ceporex 1g Tablet (Galen Ltd)   |
| Cephalosporin | 7909  | Velosef 500mg capsules (Bristol-Myers Squibb Pharmaceuticals Ltd)   |
| Cephalosporin | 61268 | Cefuroxime 250mg tablets (Waymade Healthcare Plc)   |
| Cephalosporin | 19161 | Cefalexin 500mg capsules (Ranbaxy (UK) Ltd)   |
| Cephalosporin | 29281 | Cefalexin 500mg capsules (Teva UK Ltd)  |
| Cephalosporin | 290   | Cefuroxime 1.5g powder for injection vials  |
| Cephalosporin | 36599 | Cefalexin 250mg capsules (Ranbaxy (UK) Ltd)   |
| Cephalosporin | 19342 | CEFTIZOXIME SODIUM 2 GM INJ   |
| Cephalosporin | 155   | Cefalexin 250mg capsules  |
| Cephalosporin | 34965 | Cefradine 500mg capsules (A A H Pharmaceuticals Ltd)  |
| Cephalosporin | 80338 | Ceftazidime 2g / Avibactam 500mg powder for solution for infusion vials   |
| Cephalosporin | 45221 | Cefalexin 250mg/5ml oral suspension (Actavis UK Ltd)  |
| Cephalosporin | 4454  | Cefradine 500mg capsules  |
| Cephalosporin | 34543 | Cefradine 250mg capsules (A A H Pharmaceuticals Ltd)  |
| Cephalosporin | 32181 | Cefalexin 125mg/5ml oral suspension (Actavis UK Ltd)  |
| Cephalosporin | 41736 | Cefalexin 250mg capsules (Kent Pharmaceuticals Ltd)   |
| Cephalosporin | 32750 | Moxalactam 1g/vial Injection (Eli Lilly and Company Ltd)  |
| Cephalosporin | 71038 | Cefaclor 250mg capsules (Phoenix Healthcare Distribution Ltd)   |

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| Cephalosporin | 26289 | Bactiolor MR 375mg tablets (Ranbaxy (UK) Ltd)   |
| Cephalosporin | 32441 | Claforan 2g powder for solution for injection vials (Sanofi)  |
| Cephalosporin | 82246 | Cefalexin 500mg tablets (Flynn Pharma Ltd)  |
| Cephalosporin | 77168 | Cefalexin 500mg Tablet (Berk Pharmaceuticals Ltd)   |
| Cephalosporin | 18451 | Cefalexin 1g tablets  |
| Cephalosporin | 11989 | Keflex 250mg capsules (Flynn Pharma Ltd)  |
| Cephalosporin | 52283 | Cefalexin 250mg capsules (Arrow Generics Ltd)   |
| Cephalosporin | 40945 | Ceporex 250mg/5ml syrup (Strides Pharma UK Ltd)   |
| Cephalosporin | 17123 | Zinacef 1.5g powder for injection vials (GlaxoSmithKline UK Ltd)  |
| Cephalosporin | 26989 | Kiflone 125mg/5ml Oral solution (Berk Pharmaceuticals Ltd)  |
| Cephalosporin | 66477 | Cefadroxil 500mg capsules (Waymade Healthcare Plc)  |
| Cephalosporin | 9689  | Cefalexin 500mg tablets (Teva UK Ltd)   |
| Cephalosporin | 19152 | Cefalexin 250mg capsules (Actavis UK Ltd)   |
| Cephalosporin | 232   | Cefotaxime 500mg powder for solution for injection vials  |
| Cephalosporin | 9157  | Keflex 250mg Tablet (Eli Lilly and Company Ltd)   |
| Cephalosporin | 70888 | Cefixime 400mg tablets  |
| Cephalosporin | 47163 | Cefalexin 250mg tablets (Arrow Generics Ltd)<br>Ceftazidime 500mg powder for solution for injection vials (A A H Pharmaceuticals Ltd) |
| Cephalosporin | 61881 | Ltd)  |
| Cephalosporin | 69614 | Cefadroxil 500mg capsules (Ranbaxy (UK) Ltd)  |
| Cephalosporin | 29183 | Cefuroxime 750mg with metronidazole 500mg infusion  |
| Cephalosporin | 54864 | Cefalexin 250mg capsules (Alliance Healthcare (Distribution) Ltd)   |
| Cephalosporin | 12554 | Cefsulodin 1g/vial sterile powder   |
| Cephalosporin | 7501  | Cefotaxime 1g powder for solution for injection vials   |
| Cephalosporin | 865   | Cefalexin 500mg tablets   |
| Cephalosporin | 69107 | Cefalexin 250mg capsules (Sigma Pharmaceuticals Plc)  |
| Cephalosporin | 8085  | Ceporex 500mg Tablet (Galen Ltd)  |
| Cephalosporin | 43274 | Cefotaxime 2g/vial Injection (C P Pharmaceuticals Ltd)  |
| Cephalosporin | 54955 | Cefalexin 500mg capsules (Milpharm Ltd)   |
| Cephalosporin | 8675  | Cefadroxil 125mg/5ml oral suspension  |
| Cephalosporin | 72356 | Cefradine 250mg capsules (Alliance Healthcare (Distribution) Ltd)   |
| Cephalosporin | 58920 | Cefuroxime 250mg tablets (Tillomed Laboratories Ltd)  |
| Cephalosporin | 5410  | Cefradine 250mg/5ml oral solution   |
| Cephalosporin | 3846  | Zinnat 250mg tablets (GlaxoSmithKline UK Ltd)   |
| Cephalosporin | 725   | Cefuroxime 125mg/5ml oral suspension  |
| Cephalosporin | 30530 | Ceftazidime with Saline 2g infusion   |
| Cephalosporin | 20569 | Claforan 1g powder for solution for injection vials (Sanofi)  |
| Cephalosporin | 30610 | Nicef 250mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 33329 | Cefalexin 125mg/5ml oral suspension (Teva UK Ltd)   |
| Cephalosporin | 2661  | Ceporex 500mg Capsule (Galen Ltd)   |
| Cephalosporin | 4576  | Distaclor 250mg Capsule (Dista Products Ltd)  |
| Cephalosporin | 75783 | Cefalexin 250mg capsules (Lupin Healthcare (UK) Ltd)  |
| Cephalosporin | 319   | Distaclor 500mg Capsule (Dista Products Ltd)  |
| Cephalosporin | 82651 | Ceftriaxone 250mg powder for solution for injection vials (Bowmed Ibisqus Ltd)  |
| Cephalosporin | 13412 | Zinnat 125mg/5ml oral suspension (GlaxoSmithKline UK Ltd)   |

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| Cephalosporin | 34838 | Cefaclor 375mg modified-release tablets (A A H Pharmaceuticals Ltd)   |
| Cephalosporin | 14995 | Cefradine 500mg powder for solution for injection vials   |
| Cephalosporin | 34844 | Cefradine 500mg capsules (IVAX Pharmaceuticals UK Ltd)  |
| Cephalosporin | 7889  | Distaclor 375mg Modified-release tablet (Dista Products Ltd)  |
| Cephalosporin | 73144 | Cefaclor 125mg/5ml oral suspension sugar free (Teva UK Ltd)   |
| Cephalosporin | 65953 | Cefalexin 250mg capsules (Mawdsley-Brooks & Company Ltd)  |
| Cephalosporin | 5444  | Cefadroxil 250mg/5ml oral suspension  |
| Cephalosporin | 3737  | Cefaclor 250mg/5ml oral suspension  |
| Cephalosporin | 21902 | KEFLEX  |
| Cephalosporin | 82411 | Cefotaxime 1g powder for solution for injection vials (A A H Pharmaceuticals Ltd)   |
| Cephalosporin | 20515 | KEFLEX-C 250 MG TAB   |
| Cephalosporin | 19133 | Cefalexin 250mg capsules (IVAX Pharmaceuticals UK Ltd)  |
| Cephalosporin | 41230 | Ceporex 500mg/5ml syrup (Strides Pharma UK Ltd)   |
| Cephalosporin | 1713  | Cefalexin 250mg/5ml suspension  |
| Cephalosporin | 40155 | Cefotaxime 1g/vial Injection (C P Pharmaceuticals Ltd)  |
| Cephalosporin | 7485  | Keflex 125mg/5ml Liquid (Eli Lilly and Company Ltd)   |
| Cephalosporin | 55897 | Ceftazidime 1g powder for solution for injection vials (Mylan)<br>Ceftriaxone 250mg powder for solution for injection vials (A A H Pharmaceuticals Ltd) |
| Cephalosporin | 56444 | Ceftazidime 1g powder for solution for injection vials  |
| Cephalosporin | 2651  | Ceftazidime 1g powder for solution for injection vials  |
| Cephalosporin | 20204 | CEFTIZOXIME SODIUM .5 GM INJ  |
| Cephalosporin | 29748 | Cefalexin 125mg/5ml oral suspension (A A H Pharmaceuticals Ltd)   |
| Cephalosporin | 70174 | Ceftolozane 1g / Tazobactam 500mg powder for solution for infusion vials  |
| Cephalosporin | 16202 | Rocephin 1g powder for solution for injection vials (Roche Products Ltd)  |
| Cephalosporin | 43425 | Cefaclor 500mg capsules (A A H Pharmaceuticals Ltd)   |
| Cephalosporin | 60202 | Cefalexin 250mg/5ml oral suspension (Kent Pharmaceuticals Ltd)  |
| Cephalosporin | 24046 | Ceftazidime 500mg powder for solution for injection vials   |
| Cephalosporin | 81711 | Ceftriaxone 2g powder for solution for infusion vials (MIP Pharma GmbH)   |
| Cephalosporin | 3831  | Suprax Paediatric 100mg/5ml oral suspension (Sanofi)  |
| Cephalosporin | 77524 | Cefradine 250mg capsules (Waymade Healthcare Plc)   |
| Cephalosporin | 53945 | Cefalexin 125mg/5ml oral suspension (Alliance Healthcare (Distribution) Ltd)  |
| Cephalosporin | 61418 | Cefadroxil 500mg capsules (Sigma Pharmaceuticals Plc)   |
| Cephalosporin | 16595 | Ceftazidime 250mg powder for solution for injection vials   |
| Cephalosporin | 67749 | Cefalexin 250mg tablets (PLIVA Pharma Ltd)  |
| Cephalosporin | 33605 | Nicef 500mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 40884 | Ceporex 250mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 31827 | Cefalexin 500mg tablets (IVAX Pharmaceuticals UK Ltd)   |
| Cephalosporin | 8008  | Ceporex 250mg/5ml Oral solution (Galen Ltd)   |
| Cephalosporin | 830   | Keflex 250mg tablets (Flynn Pharma Ltd)   |
| Cephalosporin | 14553 | VELOSEF 125 MG SYR  |
| Cephalosporin | 7624  | Velosef 250mg capsules (Bristol-Myers Squibb Pharmaceuticals Ltd)   |
| Cephalosporin | 36701 | Cefalexin 250mg tablets (Mylan)   |
| Cephalosporin | 44755 | Cefalexin 500mg Capsule (Berk Pharmaceuticals Ltd)  |
| Cephalosporin | 9520  | Cefaclor 250mg Capsule (Lagap)  |
| Cephalosporin | 19909 | Cefuroxime 750mg powder for injection vials   |

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| Cephalosporin | 63596 | Cefuroxime 1.5g powder for injection vials (A A H Pharmaceuticals Ltd)  |
| Cephalosporin | 10455 | Keflex 250mg/5ml Liquid (Eli Lilly and Company Ltd)   |
| Cephalosporin | 30789 | Cefradine 250mg capsules (Mylan)  |
| Cephalosporin | 59406 | Cefalexin 500mg tablets (Waymade Healthcare Plc)  |
| Cephalosporin | 7502  | Ceftazidime 2g powder for solution for injection vials  |
| Cephalosporin | 24090 | Cefalexin 250mg capsules (PLIVA Pharma Ltd)   |
| Cephalosporin | 32643 | Cefalexin 500mg capsules (A A H Pharmaceuticals Ltd)  |
| Cephalosporin | 59269 | Cefalexin 250mg capsules (DE Pharmaceuticals)   |
| Cephalosporin | 20992 | Distaclor MR 375mg tablets (Flynn Pharma Ltd)   |
| Cephalosporin | 40915 | Ceporex 500mg capsules (Strides Pharma UK Ltd)  |
| Cephalosporin | 21956 | DISTACLOR   |
| Cephalosporin | 13910 | Cefaclor 125mg/5ml Liquid (Generics (UK) Ltd)   |
| Cephalosporin | 21877 | KEFLEX  |
| Cephalosporin | 17129 | Orelox 40mg/5ml oral suspension paediatric (Sanofi)   |
| Cephalosporin | 58239 | Ceftriaxone 1g powder for solution for injection vials (A A H Pharmaceuticals Ltd)<br>Cefaclor 125mg/5ml oral suspension sugar free (Phoenix Healthcare Distribution Ltd) |
| Cephalosporin | 56610 |   |
| Cephalosporin | 9647  | Velosef 250mg/5ml syrup (Bristol-Myers Squibb Pharmaceuticals Ltd)  |
| Cephalosporin | 40189 | CEFAMANDOLE 1 GM INJ  |
| Cephalosporin | 61661 | Cefalexin 125mg/5ml oral suspension (Waymade Healthcare Plc)  |
| Cephalosporin | 3523  | Distaclor 500mg Modified-release tablet (Dista Products Ltd)  |
| Cephalosporin | 20549 | Cedax 18mg/ml Liquid (Schering-Plough Ltd)  |
| Cephalosporin | 36330 | Cefalexin 250mg tablets (Actavis UK Ltd)  |
| Cephalosporin | 82118 | Cefotaxime 2g powder for solution for injection vials (Wockhardt UK Ltd)  |
| Cephalosporin | 30769 | Cefradine 250mg capsules (IVAX Pharmaceuticals UK Ltd)  |
| Cephalosporin | 23510 | Kefadim 500mg powder for solution for injection vials (Flynn Pharma Ltd)  |
| Cephalosporin | 41968 | Cefalexin 250mg/5ml oral suspension (Teva UK Ltd)   |
| Cephalosporin | 1942  | Cefadroxil 500mg capsules   |
| Cephalosporin | 24618 | Keflex 500mg capsules (Flynn Pharma Ltd)  |
| Cephalosporin | 34913 | Cefaclor 125mg/5ml Oral suspension (Genus Pharmaceuticals Ltd)  |
| Cephalosporin | 79098 | Cefuroxime 750mg powder for injection vials (Flynn Pharma Ltd)  |
| Cephalosporin | 9293  | Cefaclor 250mg/5ml oral suspension sugar free   |
| Cephalosporin | 82448 | Cefuroxime 250mg powder for injection vials (A A H Pharmaceuticals Ltd)   |
| Cephalosporin | 32730 | Fortum 250mg powder for solution for injection vials (GlaxoSmithKline UK Ltd)   |
| Cephalosporin | 48025 | Cefaclor 250mg/5ml oral suspension (Ranbaxy (UK) Ltd)   |
| Cephalosporin | 17150 | Ceporex 125mg/1.25ml Drops (Glaxo Laboratories Ltd)   |
| Cephalosporin | 400   | Cefalexin 500mg capsules  |
| Cephalosporin | 27072 | Keflex 125mg/5ml oral suspension (Flynn Pharma Ltd)   |
| Cephalosporin | 21979 | Kiflone 250mg/5ml Oral solution (Berk Pharmaceuticals Ltd)  |
| Cephalosporin | 67797 | Ceftazidime 1g powder for solution for injection vials (Wockhardt UK Ltd)   |
| Cephalosporin | 82183 | Cefotaxime 1g powder for solution for injection vials (MIP Pharma GmbH)   |
| Cephalosporin | 58963 | Ceftriaxone 2g powder for solution for infusion vials (Kent Pharmaceuticals Ltd)  |
| Cephalosporin | 2976  | Cefaclor 500mg capsules   |
| Cephalosporin | 64903 | Ceftriaxone 1g powder for solution for injection vials (Wockhardt UK Ltd)   |
| Cephalosporin | 1306  | Suprax 200mg tablets (Sanofi)   |

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| Cephalosporin | 12065 | Cefpodoxime 100mg tablets  |
| Cephalosporin | 2428  | Distaclor 125mg/5ml Liquid (Dista Products Ltd)  |
| Cephalosporin | 47983 | Cefuroxime 250mg tablets (A A H Pharmaceuticals Ltd)   |
| Cephalosporin | 17782 | Baxan 500mg/5ml oral suspension (Bristol-Myers Squibb Pharmaceuticals Ltd)   |
| Cephalosporin | 20526 | KEFLEX-C 125 MG TAB  |
| Cephalosporin | 192   | Ceporex 250mg Capsule (Galen Ltd)  |
| Cephalosporin | 25384 | Distaclor 125mg/5ml oral suspension (Flynn Pharma Ltd)   |
| Cephalosporin | 55387 | Cefuroxime 125mg granules sachets  |
| Cephalosporin | 44263 | Mefoxin 1g powder for solution for injection vials (Merck Sharp & Dohme Ltd)   |
| Cephalosporin | 17889 | Ceftibuten 90mg/5ml suspension   |
| Cephalosporin | 325   | Cefalotin 1g/vial injection  |
| Cephalosporin | 80845 | Ceftobiprole 500mg powder for solution for infusion vials  |
| Cephalosporin | 30046 | Claforan 500mg powder for solution for injection vials (Sanofi)  |
| Cephalosporin | 42008 | Cefalexin 250mg/5ml oral suspension (A A H Pharmaceuticals Ltd)  |
| Cephalosporin | 26992 | Kiflone 500mg Tablet (Berk Pharmaceuticals Ltd)  |
| Cephalosporin | 843   | Cefixime 200mg tablets   |
| Cephalosporin | 46973 | Cefaclor 250mg/5ml Oral suspension (Genus Pharmaceuticals Ltd)   |
| Cephalosporin | 67743 | Cefradine 500mg capsules (Kent Pharmaceuticals Ltd)  |
| Cephalosporin | 17881 | Ceftibuten 180mg/5ml suspension  |
| Cephalosporin | 71071 | Cefaclor 125mg/5ml oral suspension (Phoenix Healthcare Distribution Ltd)   |
| Cephalosporin | 73065 | Zinnat 250mg tablets (Lexon (UK) Ltd)  |
| Cephalosporin | 7587  | Cefuroxime 250mg powder for injection vials  |
| Cephalosporin | 71055 | Cefradine 250mg capsules (Phoenix Healthcare Distribution Ltd)   |
| Cephalosporin | 70402 | Cefalexin 500mg capsules (Mawdsley-Brooks & Company Ltd)   |
| Cephalosporin | 66179 | Cefalexin 500mg capsules (Waymade Healthcare Plc)  |
| Cephalosporin | 20409 | Cefaclor 250mg/5ml Liquid (Lagap)  |
| Cephalosporin | 3678  | Cefuroxime 250mg tablets   |
| Cephalosporin | 28685 | Rocephin 2g powder for solution for injection vials (Roche Products Ltd)   |
| Cephalosporin | 25614 | Cefotaxime 2g powder for solution for injection vials<br>Velosef 500mg powder for solution for injection vials (Bristol-Myers Squibb<br>Pharmaceuticals Ltd) |
| Cephalosporin | 24817 | Pharmaceuticals Ltd)   |
| Cephalosporin | 68521 | Cefalexin 125mg/5ml oral suspension (Arrow Generics Ltd)   |
| Cephalosporin | 1693  | Cefalexin 125mg/5ml oral suspension  |
| Cephalosporin | 56250 | Cefadroxil 500mg capsules (Sandoz Ltd)   |
| Cephalosporin | 30471 | Ceporin 1g Injection (Glaxo Laboratories Ltd)  |
| Cephalosporin | 41982 | Fortum 2g/vial Powder for solution for injection (Glaxo Laboratories Ltd)  |
| Cephalosporin | 17292 | Zinacef 750mg powder for injection vials (GlaxoSmithKline UK Ltd)  |
| Cephalosporin | 8019  | Ceporex 250mg Tablet (Galen Ltd)   |
| Cephalosporin | 9219  | Distaclor 250mg/5ml Liquid (Dista Products Ltd)  |
| Cephalosporin | 81471 | Cefalexin 250mg capsules (Flynn Pharma Ltd)  |
| Cephalosporin | 12268 | Baxan 125mg/5ml oral suspension (Bristol-Myers Squibb Pharmaceuticals Ltd)   |
| Cephalosporin | 28722 | Keflex 250mg/5ml oral suspension (Flynn Pharma Ltd)  |
| Cephalosporin | 10794 | Zinnat 125mg tablets (GlaxoSmithKline UK Ltd)  |
| Cephalosporin | 39417 | Cefalexin 125mg/5ml oral suspension (Mylan)  |
| Cephalosporin | 34253 | Cefalexin 250mg capsules (A A H Pharmaceuticals Ltd)   |

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| Cephalosporin | 7526  | Cefaclor 125mg/5ml oral suspension sugar free   |
| Coamoxiclav   | 78021 | Co-amoxiclav 400mg/57mg/5ml oral suspension sugar free (Alliance Healthcare (Distribution) Ltd)   |
| Coamoxiclav   | 75269 | Co-amoxiclav 250mg/125mg tablets (Rivopharm (UK) Ltd)<br>Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (A A H Pharmaceuticals Ltd)                         |
| Coamoxiclav   | 43548 | Ltd)  |
| Coamoxiclav   | 509   | Augmentin 625mg tablets (GlaxoSmithKline UK Ltd)  |
| Coamoxiclav   | 2507  | Augmentin 375mg dispersible tablets (GlaxoSmithKline UK Ltd)  |
| Coamoxiclav   | 9925  | Clavulanic acid 125mg with Amoxicillin 250mg tablets<br>Co-amoxiclav 1000mg/200mg powder for solution for injection vials (Teva UK Ltd)                             |
| Coamoxiclav   | 79672 | Ltd)  |
| Coamoxiclav   | 28871 | Co-amoxiclav 250mg/125mg tablets (IVAX Pharmaceuticals UK Ltd)  |
| Coamoxiclav   | 51623 | Co-amoxiclav 250mg/125mg tablets (Alliance Healthcare (Distribution) Ltd)<br>Co-amoxiclav 500mg/100mg powder for solution for injection vials (Bowmed Ibisqus Ltd)  |
| Coamoxiclav   | 73039 | Ibisqus Ltd)  |
| Coamoxiclav   | 60034 | Co-amoxiclav 250mg/125mg tablets (DE Pharmaceuticals)   |
| Coamoxiclav   | 76760 | Co-amoxiclav 875mg/125mg tablets (Mawdsley-Brooks & Company Ltd)  |
| Coamoxiclav   | 65215 | Co-amoxiclav 250mg/125mg tablets (Sigma Pharmaceuticals Plc)  |
| Coamoxiclav   | 50595 | Augmentin 125/31 SF oral suspension (Mawdsley-Brooks & Company Ltd)   |
| Coamoxiclav   | 49610 | Co-amoxiclav 500mg/125mg tablets (Medreich Plc)   |
| Coamoxiclav   | 75547 | Co-amoxiclav 250mg/62mg/5ml oral suspension (Ennogen Healthcare Ltd)  |
| Coamoxiclav   | 20432 | Clavulanic acid 57mg with amoxicillin 400mg/5ml sugar free suspension   |
| Coamoxiclav   | 1391  | Amoxicillin 250mg / Clavulanic acid 125mg tablets   |
| Coamoxiclav   | 82881 | Augmentin 125/31 SF oral suspension (DE Pharmaceuticals)  |
| Coamoxiclav   | 49683 | Augmentin 625mg tablets (Waymade Healthcare Plc)  |
| Coamoxiclav   | 75663 | Co-amoxiclav 250mg/125mg tablets (Bristol Laboratories Ltd)   |
| Coamoxiclav   | 56591 | Augmentin-Duo 400/57 oral suspension (Lexon (UK) Ltd)   |
| Coamoxiclav   | 829   | Co-amoxiclav 250mg/125mg dispersible tablets sugar free   |
| Coamoxiclav   | 57081 | Co-amoxiclav 500mg/125mg tablets (Waymade Healthcare Plc)   |
| Coamoxiclav   | 40320 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Ranbaxy (UK) Ltd)   |
| Coamoxiclav   | 71937 | Co-amoxiclav 500mg/125mg tablets (Almus Pharmaceuticals Ltd)<br>Co-amoxiclav 500mg/125mg tablets (APC Pharmaceuticals & Chemicals (Europe) Ltd)                     |
| Coamoxiclav   | 53609 | Ltd)  |
| Coamoxiclav   | 44154 | Co-amoxiclav 500mg/125mg tablets (Zentiva)  |
| Coamoxiclav   | 25370 | Ranclav 375mg tablets (Ranbaxy (UK) Ltd)  |
| Coamoxiclav   | 46915 | Co-amoxiclav 250mg/125mg tablets (Zentiva)  |
| Coamoxiclav   | 17121 | Clavulanic acid 100mg with amoxicillin 500mg/vial injection   |
| Coamoxiclav   | 49048 | Augmentin 375mg tablets (Waymade Healthcare Plc)  |
| Coamoxiclav   | 24093 | Clavulanic acid with amoxicillin dispersible tablets  |
| Coamoxiclav   | 49374 | Augmentin 375mg tablets (Mawdsley-Brooks & Company Ltd)   |
| Coamoxiclav   | 63452 | Co-amoxiclav 875mg/125mg tablets (Creo Pharma Ltd)  |
| Coamoxiclav   | 34493 | Co-amoxiclav 500mg/125mg tablets (Ranbaxy (UK) Ltd)   |
| Coamoxiclav   | 67694 | Co-amoxiclav 250mg/125mg tablets (Mawdsley-Brooks & Company Ltd)<br>Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Alliance Healthcare (Distribution) Ltd) |
| Coamoxiclav   | 71819 | (Distribution) Ltd)   |
| Coamoxiclav   | 42227 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (A A H Pharmaceuticals Ltd)  |

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| Coamoxiclav | 58097 | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Kent Pharmaceuticals Ltd)  |
| Coamoxiclav | 13216 | Amoxicillin 500mg / Clavulanic acid 125mg tablets  |
| Coamoxiclav | 76188 | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Teva UK Ltd)   |
| Coamoxiclav | 54324 | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Actavis UK Ltd)<br>Co-amoxiclav 1000mg/200mg powder for solution for injection vials (Intrapharm Laboratories Ltd) |
| Coamoxiclav | 80713 | Laboratories Ltd)  |
| Coamoxiclav | 399   | Augmentin 375mg tablets (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav | 439   | Amoxicillin with Clavulanic acid dispersible tablets<br>Co-amoxiclav 1000mg/200mg powder for solution for injection vials (PLIVA Pharma Ltd)                               |
| Coamoxiclav | 67771 | Pharma Ltd)  |
| Coamoxiclav | 34297 | Co-amoxiclav 250mg/125mg tablets (Mylan)<br>Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (IVAX Pharmaceuticals UK Ltd)   |
| Coamoxiclav | 28874 | UK Ltd)  |
| Coamoxiclav | 27886 | AMOXYCILLIN 250/CLAVULANIC ACID 125 DISP   |
| Coamoxiclav | 82932 | Co-amoxiclav 1000mg/200mg powder for solution for injection vials (Sandoz Ltd)   |
| Coamoxiclav | 8906  | Amoxicillin 125mg / Clavulanic acid 31mg/5ml oral suspension   |
| Coamoxiclav | 19209 | Co-amoxiclav 250mg/125mg tablets (Actavis UK Ltd)<br>Co-amoxiclav 400mg/57mg/5ml oral suspension sugar free (A A H Pharmaceuticals Ltd)                                    |
| Coamoxiclav | 51637 | Ltd)   |
| Coamoxiclav | 54591 | Co-amoxiclav 500mg/125mg tablets (Phoenix Healthcare Distribution Ltd)   |
| Coamoxiclav | 35191 | Co-amoxiclav 500mg/100mg powder for solution for injection vials (Teva UK Ltd)   |
| Coamoxiclav | 76854 | Augmentin-Duo 400/57 oral suspension (Dowelhurst Ltd)  |
| Coamoxiclav | 30705 | Co-amoxiclav 500mg/125mg tablets (Mylan)   |
| Coamoxiclav | 54708 | Co-amoxiclav 250mg/62mg/5ml oral suspension (A A H Pharmaceuticals Ltd)  |
| Coamoxiclav | 81146 | Co-amoxiclav 250mg/62mg/5ml oral suspension (Waymade Healthcare Plc)   |
| Coamoxiclav | 10200 | Co-amoxiclav 125mg/31mg/5ml oral suspension  |
| Coamoxiclav | 50446 | Co-amoxiclav 250mg/125mg tablets (Phoenix Healthcare Distribution Ltd)   |
| Coamoxiclav | 415   | Augmentin 125/31 SF oral suspension (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav | 26658 | AUGMENTIN DISPERSIBLE 250/125  |
| Coamoxiclav | 7636  | Amoxicillin 250mg / Clavulanic acid 62mg/5ml oral suspension   |
| Coamoxiclav | 51164 | Augmentin 125/31 SF oral suspension (Waymade Healthcare Plc)   |
| Coamoxiclav | 48683 | Augmentin 375mg tablets (Lexon (UK) Ltd)   |
| Coamoxiclav | 52207 | Augmentin 625mg tablets (Mawdsley-Brooks & Company Ltd)  |
| Coamoxiclav | 50742 | Co-amoxiclav 500mg/125mg tablets (Actavis UK Ltd)  |
| Coamoxiclav | 51194 | Augmentin-Duo 400/57 oral suspension (Sigma Pharmaceuticals Plc)   |
| Coamoxiclav | 49063 | Augmentin 375mg tablets (DE Pharmaceuticals)   |
| Coamoxiclav | 81301 | Co-amoxiclav 250mg/125mg tablets (Consilient Health Ltd)   |
| Coamoxiclav | 65533 | Co-amoxiclav 250mg/62mg/5ml oral suspension (CST Pharma Ltd)   |
| Coamoxiclav | 19795 | AMOXYCILLIN 250MG/CLAVULANIC ACID 125MG  |
| Coamoxiclav | 1638  | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free   |
| Coamoxiclav | 69292 | Co-amoxiclav 500mg/125mg tablets (Sigma Pharmaceuticals Plc)<br>Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Alliance Healthcare (Distribution) Ltd)            |
| Coamoxiclav | 54452 | (Distribution) Ltd)  |
| Coamoxiclav | 73983 | Augmentin 375mg tablets (Dowelhurst Ltd)   |
| Coamoxiclav | 13285 | Amoxicillin 125mg / Clavulanic acid 31mg/5ml oral suspension   |
| Coamoxiclav | 54780 | Co-amoxiclav 250mg/62mg/5ml oral suspension (Mylan)  |

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| Coamoxiclav | 62597 | Augmentin-Duo 400/57 oral suspension (Mawdsley-Brooks & Company Ltd)                               |
| Coamoxiclav | 33693 | Co-amoxiclav 250mg/125mg tablets (Kent Pharmaceuticals Ltd)  |
| Coamoxiclav | 66747 | Co-amoxiclav 250mg/125mg tablets (Brown & Burk UK Ltd)   |
| Coamoxiclav | 34680 | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Ranbaxy (UK) Ltd)                          |
| Coamoxiclav | 62377 | Co-amoxiclav 500mg/125mg tablets (Creo Pharma Ltd)   |
| Coamoxiclav | 50341 | Co-amoxiclav 500mg/125mg tablets (Alliance Healthcare (Distribution) Ltd)                          |
| Coamoxiclav | 40148 | Co-amoxiclav 500mg/125mg tablets (Kent Pharmaceuticals Ltd)  |
| Coamoxiclav | 62332 | Co-amoxiclav 875mg/125mg tablets   |
| Coamoxiclav | 5341  | Augmentin-Duo 400/57 oral suspension (GlaxoSmithKline UK Ltd)                                      |
| Coamoxiclav | 69920 | Co-amoxiclav 125mg/31mg/5ml oral suspension (Ennogen Healthcare Ltd)                               |
| Coamoxiclav | 75243 | Co-amoxiclav 1000mg/200mg powder for solution for injection vials (Peckforton Pharmaceuticals Ltd) |
| Coamoxiclav | 24005 | Co-amoxiclav 1000mg/200mg powder for solution for injection vials                                  |
| Coamoxiclav | 72664 | Amoxicillin 875mg / Clavulanic acid 125mg tablets  |
| Coamoxiclav | 49321 | Augmentin 625mg tablets (Sigma Pharmaceuticals Plc)  |
| Coamoxiclav | 29353 | Co-amoxiclav 500mg/125mg tablets (Teva UK Ltd)   |
| Coamoxiclav | 13239 | Clavulanic acid 125mg with Amoxicillin 500mg tablets   |
| Coamoxiclav | 25034 | AMOXICILLIN 125mg/62mg CLAVULANIC ACID   |
| Coamoxiclav | 61299 | Co-amoxiclav 125mg/31mg/5ml oral suspension (Mawdsley-Brooks & Company Ltd)                        |
| Coamoxiclav | 577   | Co-amoxiclav 500mg/100mg powder for solution for injection vials                                   |
| Coamoxiclav | 6687  | Co-amoxiclav 400mg/57mg/5ml oral suspension sugar free   |
| Coamoxiclav | 65056 | Co-amoxiclav 400mg/57mg/5ml oral suspension sugar free (Sandoz Ltd)                                |
| Coamoxiclav | 75317 | Co-amoxiclav 500mg/125mg tablets (Consilient Health Ltd)   |
| Coamoxiclav | 15192 | Amoxicillin 400mg / Clavulanic acid 57mg/5ml sugar free oral suspension                            |
| Coamoxiclav | 68408 | Co-amoxiclav 400mg/57mg/5ml oral suspension sugar free (Brown & Burk UK Ltd)                       |
| Coamoxiclav | 80631 | Co-amoxiclav 500mg/125mg tablets (Torrent Pharma (UK) Ltd)   |
| Coamoxiclav | 67466 | Co-amoxiclav 500mg/125mg tablets (Brown & Burk UK Ltd)   |
| Coamoxiclav | 30783 | Co-amoxiclav 250mg/125mg tablets (Ranbaxy (UK) Ltd)  |
| Coamoxiclav | 46918 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Sandoz Ltd)                                |
| Coamoxiclav | 16612 | Clavulanic acid 62mg with amoxicillin 250mg/5ml sugar free suspension                              |
| Coamoxiclav | 63063 | Co-amoxiclav 250mg/62mg/5ml oral suspension (DE Pharmaceuticals)                                   |
| Coamoxiclav | 37304 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (IVAX Pharmaceuticals UK Ltd)               |
| Coamoxiclav | 56578 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Waymade Healthcare Plc)                    |
| Coamoxiclav | 56884 | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Phoenix Healthcare Distribution Ltd)       |
| Coamoxiclav | 51678 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Almus Pharmaceuticals Ltd)                 |
| Coamoxiclav | 55312 | Co-amoxiclav 250mg/125mg tablets (Waymade Healthcare Plc)  |
| Coamoxiclav | 59908 | Co-amoxiclav 500mg/125mg tablets (DE Pharmaceuticals)  |
| Coamoxiclav | 58803 | Co-amoxiclav 250mg/125mg tablets (APC Pharmaceuticals & Chemicals (Europe) Ltd)                    |
| Coamoxiclav | 29356 | Co-amoxiclav 500mg/125mg tablets (IVAX Pharmaceuticals UK Ltd)                                     |
| Coamoxiclav | 545   | Co-amoxiclav 250mg/125mg tablets   |



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| Coamoxiclav | 50279 | Augmentin 625mg tablets (DE Pharmaceuticals)   |
| Coamoxiclav | 7581  | AMOXYCILLIN 125MG/62MG CLAVULANIC ACID SYR   |
| Coamoxiclav | 79302 | Co-amoxiclav 250mg/62mg/5ml oral suspension (Sigma Pharmaceuticals Plc)<br>Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Colorama<br>Pharmaceuticals Ltd)    |
| Coamoxiclav | 61407 | Pharmaceuticals Ltd)   |
| Coamoxiclav | 80763 | Co-amoxiclav 250mg/125mg tablets (Torrent Pharma (UK) Ltd)   |
| Coamoxiclav | 60281 | Co-amoxiclav 125mg/31mg/5ml oral suspension (CST Pharma Ltd)   |
| Coamoxiclav | 34972 | Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Sandoz Ltd)  |
| Coamoxiclav | 19414 | Co-amoxiclav 250mg/125mg tablets (Sandoz Ltd)<br>Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Phoenix Healthcare<br>Distribution Ltd)                       |
| Coamoxiclav | 59740 | Distribution Ltd)  |
| Coamoxiclav | 30786 | Co-amoxiclav 250mg/125mg tablets (A A H Pharmaceuticals Ltd)   |
| Coamoxiclav | 7364  | Co-amoxiclav 250mg/62mg/5ml oral suspension  |
| Coamoxiclav | 82244 | Co-amoxiclav 500mg/100mg powder for solution for injection vials (Sandoz Ltd)<br>Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Almus Pharmaceuticals<br>Ltd) |
| Coamoxiclav | 54808 | Ltd)<br>Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Kent Pharmaceuticals<br>Ltd)   |
| Coamoxiclav | 60134 | Ltd)   |
| Coamoxiclav | 29474 | Amoxicillin 1000mg with clavulanic acid 100mg/vial injection   |
| Coamoxiclav | 71541 | Co-amoxiclav 125mg/31mg/5ml oral suspension (Sigma Pharmaceuticals Plc)  |
| Coamoxiclav | 34734 | Co-amoxiclav 250mg/125mg tablets (Teva UK Ltd)   |
| Coamoxiclav | 49656 | Augmentin 625mg tablets (Lexon (UK) Ltd)   |
| Coamoxiclav | 569   | Augmentin 250/62 SF oral suspension (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav | 24006 | Clavulanic acid 31mg with amoxicillin 125mg/5ml oral suspension  |
| Coamoxiclav | 52666 | Augmentin 250/62 SF oral suspension (Sigma Pharmaceuticals Plc)<br>Co-amoxiclav 500mg/100mg powder for solution for injection vials (A A H<br>Pharmaceuticals Ltd)     |
| Coamoxiclav | 64986 | Pharmaceuticals Ltd)   |
| Coamoxiclav | 524   | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free<br>Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Colorama<br>Pharmaceuticals Ltd)                     |
| Coamoxiclav | 58494 | Pharmaceuticals Ltd)   |
| Coamoxiclav | 75782 | Co-amoxiclav 125mg/31mg/5ml oral suspension (DE Pharmaceuticals)<br>Augmentin Intravenous 1.2g powder for solution for injection vials<br>(GlaxoSmithKline UK Ltd)     |
| Coamoxiclav | 244   | (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav | 54052 | Co-amoxiclav 125mg/31mg/5ml oral suspension (A A H Pharmaceuticals Ltd)  |
| Coamoxiclav | 27681 | Ranclav 125mg/31mg/5ml SF oral suspension (Ranbaxy (UK) Ltd)   |
| Coamoxiclav | 59588 | Co-amoxiclav 125mg/31mg/5ml oral suspension (Waymade Healthcare Plc)   |
| Coamoxiclav | 75331 | Co-amoxiclav 500mg/125mg tablets (Bristol Laboratories Ltd)  |
| Coamoxiclav | 34234 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Teva UK Ltd)<br>Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Mawdsley-Brooks &<br>Company Ltd)      |
| Coamoxiclav | 69140 | Company Ltd)<br>Augmentin Intravenous 600mg powder for solution for injection vials<br>(GlaxoSmithKline UK Ltd)  |
| Coamoxiclav | 17852 | (GlaxoSmithKline UK Ltd)   |
| Coamoxiclav | 33701 | Co-amoxiclav 500mg/125mg tablets (A A H Pharmaceuticals Ltd)   |
| Coamoxiclav | 82866 | Co-amoxiclav 500mg/125mg tablets (Medihealth (Northern) Ltd)<br>Co-amoxiclav 500mg/100mg powder for solution for injection vials (Wockhardt<br>UK Ltd)                 |
| Coamoxiclav | 47184 | UK Ltd)  |
| Coamoxiclav | 80191 | Co-amoxiclav 250mg/62mg/5ml oral suspension sugar free (Medreich Plc)  |
| Coamoxiclav | 53996 | Co-amoxiclav 500mg/125mg tablets (Milpharm Ltd)  |

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| Coamoxiclav    | 42485 | Clavulanic acid 62mg with amoxicillin 250mg/5ml oral suspension<br>Co-amoxiclav 1000mg/200mg powder for solution for injection vials (Wockhardt UK Ltd)       |
| Coamoxiclav    | 66905 | UK Ltd)   |
| Coamoxiclav    | 641   | Co-amoxiclav 500mg/125mg tablets  |
| Coamoxiclav    | 82252 | Co-amoxiclav 250mg/125mg tablets (Medihealth (Northern) Ltd)  |
| Coamoxiclav    | 62686 | Co-amoxiclav 125mg/31mg/5ml oral suspension (Pharma-z Ltd)  |
| Coamoxiclav    | 22029 | Amiclav 250mg/125mg tablets (Ashbourne Pharmaceuticals Ltd)   |
| Coamoxiclav    | 22469 | AMOXYCILLIN 125mg/31mg CLAVULANIC ACID<br>Co-amoxiclav 125mg/31mg/5ml oral suspension sugar free (Waymade Healthcare Plc)                                     |
| Coamoxiclav    | 66650 | Plc)  |
| Coamoxiclav    | 48147 | Co-amoxiclav 250mg/125mg tablets (Almus Pharmaceuticals Ltd)  |
| Coamoxiclav    | 21775 | Clavulanic acid 31mg with amoxicillin 125mg/5ml sugar free oral suspension  |
| Coamoxiclav    | 28592 | Amoxicillin 500mg with clavulanic acid 100mg/vial injection   |
| Coamoxiclav    | 53942 | Amoxicillin 125mg / Clavulanic acid 62.5mg/5ml oral suspension  |
| Coamoxiclav    | 13262 | Amoxicillin 250mg / Clavulanic acid 62mg/5ml oral suspension  |
| Coamoxiclav    | 32910 | Co-amoxiclav 500mg/125mg tablets (Sandoz Ltd)   |
| Coamoxiclav    | 54732 | Co-amoxiclav 125mg/31mg/5ml oral suspension (Mylan)   |
| Corticosteroid | 454   | Pulmicort 200microgram Inhaler (AstraZeneca UK Ltd)   |
| Corticosteroid | 71371 | Symbicort 100/6 Turbohaler (Waymade Healthcare Plc)   |
| Corticosteroid | 23111 | Triamcinolone 4mg Tablet  |
| Corticosteroid | 14700 | Budesonide 400micrograms/actuation inhaler  |
| Corticosteroid | 4942  | Budesonide 1mg/2ml nebuliser liquid unit dose vials   |
| Corticosteroid | 50225 | Betnesol 500microgram soluble tablets (Waymade Healthcare Plc)  |
| Corticosteroid | 5490  | Deltacortril 5mg gastro-resistant tablets (Phoenix Labs Ltd)  |
| Corticosteroid | 557   | Prednisolone 2.5mg gastro-resistant tablets   |
| Corticosteroid | 58987 | Prednisolone 5mg gastro-resistant tablets (Phoenix Healthcare Distribution Ltd)   |
| Corticosteroid | 74497 | Hydrocortisone 7.5mg/5ml oral suspension  |
| Corticosteroid | 2130  | Methylprednisolone 4mg tablets<br>Hydrocortisone 2.5mg muco-adhesive buccal tablets sugar free (Sigma Pharmaceuticals Plc)                                    |
| Corticosteroid | 66556 | Pharmaceuticals Plc)  |
| Corticosteroid | 76923 | Methylprednisolone 1mg/5ml oral suspension  |
| Corticosteroid | 29322 | BETAMETHASONE LOZ<br>Methylprednisolone 40mg/1ml / Lidocaine 10mg/1ml (1%) suspension for injection vials   |
| Corticosteroid | 35156 | vials   |
| Corticosteroid | 48088 | Budenofalk 9mg gastro-resistant granules sachets (Dr. Falk Pharma UK Ltd)<br>Prednisolone Dompe 5mg/5ml oral solution unit dose (Logixx Pharma Solutions Ltd) |
| Corticosteroid | 66015 | Ltd)  |
| Corticosteroid | 16583 | Kenalog Intra-articular / Intramuscular 40mg/1ml suspension for injection vials (Bristol-Myers Squibb Pharmaceuticals Ltd)                                    |
| Corticosteroid | 34781 | Prednisolone 5mg tablets (Kent Pharmaceuticals Ltd)   |
| Corticosteroid | 74156 | Dexamethasone 2.5mg/5ml oral solution   |
| Corticosteroid | 35688 | Methylprednisolone acetate 120mg/3ml suspension for injection vials   |
| Corticosteroid | 10683 | Medrone 2mg tablets (Pfizer Ltd)  |
| Corticosteroid | 7286  | Betamethasone 500microgram soluble tablets sugar free   |
| Corticosteroid | 39102 | Budesonide 100micrograms/dose inhaler CFC free  |
| Corticosteroid | 75272 | Symbicort 100/6 Turbohaler (DE Pharmaceuticals)   |
| Corticosteroid | 9994  | Decadron 500microgram tablets (Merck Sharp & Dohme Ltd)   |

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| Corticosteroid | 75384 | Hydrocortisone 20mg/5ml oral suspension  |
| Corticosteroid | 28859 | Deltastab 5mg Tablet (Waymade Healthcare Plc)  |
| Corticosteroid | 16724 | PREDNISONONE 50 MG TAB<br>Budesonide 200micrograms/dose / Formoterol 6micrograms/dose dry powder   |
| Corticosteroid | 6796  | inhaler  |
| Corticosteroid | 75064 | Alkindi 0.5mg granules in capsules for opening (Diurnal Ltd)   |
| Corticosteroid | 53207 | Dexamethasone tablets  |
| Corticosteroid | 59418 | Plenadren 5mg modified-release tablets (Shire Pharmaceuticals Ltd)   |
| Corticosteroid | 48406 | Triamcinolone acetonide 40mg/1ml suspension for injection vials  |
| Corticosteroid | 2125  | Pulmicort 200microgram Refill canister (AstraZeneca UK Ltd)  |
| Corticosteroid | 23512 | Precortisyl 5mg Tablet (Hoechst Marion Roussel)  |
| Corticosteroid | 30244 | Triamcinolone acetonide 40mg/ml injection  |
| Corticosteroid | 25839 | Solu-Medrone 1g powder and solvent for solution for injection vials (Pfizer Ltd)   |
| Corticosteroid | 69811 | Prednisolone 30mg tablets (Accord Healthcare Ltd)  |
| Corticosteroid | 23511 | Solu-Medrone 40mg powder and solvent for solution for injection vials (Pfizer Ltd)   |
| Corticosteroid | 57856 | Triamcinolone hexacetonide 20mg/1ml suspension for injection vials   |
| Corticosteroid | 71345 | Budesonide 200micrograms/dose Turbohaler (Dowelhurst Ltd)  |
| Corticosteroid | 70611 | Dexamethasone 3mg/5ml oral solution  |
| Corticosteroid | 21903 | Oradexon-organon 2mg Tablet (Organon Laboratories Ltd)   |
| Corticosteroid | 71106 | Depo-Medrone 40mg/1ml suspension for injection vials (Waymade Healthcare Plc)  |
| Corticosteroid | 64221 | Prednisolone 5mg/5ml oral suspension   |
| Corticosteroid | 2615  | Efcortisol 100mg/ml Injection (Sovereign Medical Ltd)  |
| Corticosteroid | 3065  | Bextasol Inhalation powder (Allen & Hanburys Ltd)  |
| Corticosteroid | 37737 | Kenalog 40mg/ml Injection (E R Squibb and Sons Ltd)  |
| Corticosteroid | 34915 | Dexamethasone 500microgram tablets (Organon Laboratories Ltd)  |
| Corticosteroid | 53491 | Symbicort 200/6 Turbohaler (Sigma Pharmaceuticals Plc)<br>Easyhaler Budesonide 400micrograms/dose dry powder inhaler (Orion Pharma                     |
| Corticosteroid | 30649 | (UK) Ltd)<br>Budesonide 500micrograms/2ml nebuliser liquid unit dose vials (Almus  |
| Corticosteroid | 61975 | Pharmaceuticals Ltd)   |
| Corticosteroid | 8108  | Hydrocortisone acetate 25mg/1ml suspension for injection ampoules  |
| Corticosteroid | 74091 | Pulmicort 100 Turbohaler (Lexon (UK) Ltd)  |
| Corticosteroid | 13350 | Hydrocortisone na succinate 500mg/vial Injection   |
| Corticosteroid | 75763 | Prednisolone 5mg Tablet (Celltech Pharma Europe Ltd)   |
| Corticosteroid | 9026  | Lederspan 20mg/ml Injection (Wyeth Pharmaceuticals)  |
| Corticosteroid | 21618 | HYDROCORTISONE 1%/MICONAZOLE NITRATE 2%  |
| Corticosteroid | 23657 | CHLORHEXIDINE HCL/HYDROCORTISONE/NYSTATI   |
| Corticosteroid | 4535  | Hydrocortisone 20mg tablets  |
| Corticosteroid | 52153 | Hydrocortisone acetate Powder (Biorex Laboratories Ltd)  |
| Corticosteroid | 16815 | Triamcinolone hexacetonide 20mg/ml Injection   |
| Corticosteroid | 68860 | Dexamethasone 8mg soluble tablets sugar free (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 1971  | Betnesol 500microgram soluble tablets (Focus Pharmaceuticals Ltd)  |
| Corticosteroid | 33990 | Prednisolone 5mg Tablet (IVAX Pharmaceuticals UK Ltd)  |
| Corticosteroid | 63214 | Prednisolone 5mg soluble tablets (Alliance Healthcare (Distribution) Ltd)<br>DuoResp Spiromax 320micrograms/dose / 9micrograms/dose dry powder inhaler |
| Corticosteroid | 61666 | (Teva UK Ltd)  |

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| Corticosteroid | 768   | Kenalog 40mg/ml Injection (E R Squibb and Sons Ltd)  |
| Corticosteroid | 14962 | Adcortyl Intra-articular / Intradermal 50mg/5ml suspension for injection vials (Bristol-Myers Squibb Pharmaceuticals Ltd)        |
| Corticosteroid | 76671 | Alkindi 5mg granules in capsules for opening (Diurnal Ltd)   |
| Corticosteroid | 63082 | Prednisolone 20mg tablets  |
| Corticosteroid | 908   | Pulmicort 400 Turbohaler (AstraZeneca UK Ltd)  |
| Corticosteroid | 60946 | Entocort CR 3mg capsules (Waymade Healthcare Plc)  |
| Corticosteroid | 34748 | Prednisolone 1mg tablets (Teva UK Ltd)   |
| Corticosteroid | 6095  | Budesonide 3mg gastro-resistant capsules   |
| Corticosteroid | 73294 | Prednisolone 2.5mg/5ml oral solution   |
| Corticosteroid | 5157  | Dexamethasone 2mg/5ml oral solution  |
| Corticosteroid | 64766 | Dexamethasone 20mg/5ml oral solution sugar free  |
| Corticosteroid | 15016 | Triamcinolone hexacetonide 5mg/ml Injection  |
| Corticosteroid | 10684 | Methylprednisolone 2mg tablets   |
| Corticosteroid | 29333 | Prednisolone 5mg tablets (Accord Healthcare Ltd)   |
| Corticosteroid | 67958 | Budesonide 200micrograms/dose / Formoterol 6micrograms/dose inhaler CFC free   |
| Corticosteroid | 19908 | Triamcinolone 2mg Tablet   |
| Corticosteroid | 72537 | Dexamethasone 4mg/5ml oral solution  |
| Corticosteroid | 22577 | Betnesol 4mg/1ml solution for injection ampoules (Focus Pharmaceuticals Ltd)   |
| Corticosteroid | 49076 | Depo-Medrone with Lidocaine suspension for injection 1ml vials (Lexon (UK) Ltd)  |
| Corticosteroid | 62656 | Prednisone 5mg Tablet (Hillcross Pharmaceuticals Ltd)  |
| Corticosteroid | 64557 | Cortiment 9mg modified-release tablets (Ferring Pharmaceuticals Ltd)   |
| Corticosteroid | 32803 | Prednisolone 5mg gastro-resistant tablets (Accord Healthcare Ltd)  |
| Corticosteroid | 23741 | Novolizer budesonide 200microgram/actuation Pressurised inhalation (Meda Pharmaceuticals Ltd)                                    |
| Corticosteroid | 22252 | ECONAZOLE NITRATE 1%/HYDROCORTISONE 1% Hydrocortisone sodium phosphate 100mg/1ml solution for injection ampoules (Advanz Pharma) |
| Corticosteroid | 71905 | (Advanz Pharma)  |
| Corticosteroid | 25014 | CROTAMITON 10%/HYDROCORTISONE 0.25%  |
| Corticosteroid | 18537 | Budesonide 200microgram inhalation powder capsules   |
| Corticosteroid | 12400 | Cortisyl 25mg Tablet (Aventis Pharma)  |
| Corticosteroid | 21218 | Dexsol 2mg/5ml oral solution (Rosemont Pharmaceuticals Ltd)  |
| Corticosteroid | 50253 | Depo-Medrone with Lidocaine suspension for injection 1ml vials (DE Pharmaceuticals)  |
| Corticosteroid | 73678 | Prednisolone 5mg gastro-resistant tablets (DE Pharmaceuticals)   |
| Corticosteroid | 49114 | Symbicort 100/6 Turbohaler (Sigma Pharmaceuticals Plc)   |
| Corticosteroid | 14188 | Methylprednisolone sodium succinate 500mg powder and solvent for solution for injection vials                                    |
| Corticosteroid | 4488  | Triamcinolone acetonide 40mg/ml IA/IM  |
| Corticosteroid | 3788  | HYDROCORTISONE I/V 100 MG INJ  |
| Corticosteroid | 14982 | Depo-Medrone 40mg/1ml suspension for injection vials (Pfizer Ltd)  |
| Corticosteroid | 58474 | Dexamethasone 2mg/5ml oral solution sugar free (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 27720 | HYDROCORTISONE Easyhaler Budesonide 100micrograms/dose dry powder inhaler (Orion Pharma (UK) Ltd)                                |
| Corticosteroid | 17670 | (UK) Ltd)  |
| Corticosteroid | 43355 | Hydrocortisone sodium phosphate 500mg/5ml solution for injection ampoules  |

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| Corticosteroid | 48746 | Depo-Medrone 40mg/1ml suspension for injection vials (Mawdsley-Brooks & Company Ltd)  |
| Corticosteroid | 1959  | Pulmicort 0.5mg Respules (AstraZeneca UK Ltd)   |
| Corticosteroid | 66867 | Triamcinolone hexacetonide 20mg/1ml suspension for injection ampoules   |
| Corticosteroid | 20670 | PREDNISOLONE E/C  |
| Corticosteroid | 71354 | Symbicort 400/12 Turbohaler (Necessity Supplies Ltd)  |
| Corticosteroid | 34166 | Efcortelan soluble 50mg/ml Injection (Glaxo Laboratories Ltd)   |
| Corticosteroid | 75460 | Pulmicort 1mg Respules (DE Pharmaceuticals)   |
| Corticosteroid | 54793 | Dexamethasone 2mg/5ml oral suspension   |
| Corticosteroid | 4123  | Kenalog 40mg/ml Intraarticular injection (E R Squibb and Sons Ltd)  |
| Corticosteroid | 1133  | Depo-medrone 40mg/ml Injection (Pharmacia Ltd)  |
| Corticosteroid | 63138 | Hydrocortisone 5mg/5ml oral solution  |
| Corticosteroid | 15471 | HYDROCORTISONE 25 MG TAB  |
| Corticosteroid | 27428 | PREDNISOLONE SODIUM PHOSPHATE 16 MG INJ   |
| Corticosteroid | 36055 | Dexamethasone 2mg Tablet (Hillcross Pharmaceuticals Ltd)  |
| Corticosteroid | 71338 | Pulmicort 200 Turbohaler (DE Pharmaceuticals)   |
| Corticosteroid | 67315 | Budesonide 400micrograms/dose Turbohaler (Waymade Healthcare Plc)   |
| Corticosteroid | 10321 | Budesonide 400microgram inhalation powder capsules  |
| Corticosteroid | 7405  | Depo-Medrone with Lidocaine suspension for injection 1ml vials (Pfizer Ltd)   |
| Corticosteroid | 2044  | PREDNISON 2.5 MG TAB  |
| Corticosteroid | 38022 | Hydrocortisone 10mg/5ml oral suspension   |
| Corticosteroid | 51570 | Symbicort 200/6 Turbohaler (DE Pharmaceuticals)   |
| Corticosteroid | 55480 | Prednisolone 2.5mg gastro-resistant tablets (Phoenix Labs Ltd)  |
| Corticosteroid | 53336 | Prednisolone 25mg tablets (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 8752  | EFCORTELAN 100 MG INJ   |
| Corticosteroid | 74157 | Dexamethasone 2.5mg/5ml oral suspension   |
| Corticosteroid | 27962 | Deltastab 1mg Tablet (Waymade Healthcare Plc)   |
| Corticosteroid | 66724 | Dexamethasone 10mg capsules   |
| Corticosteroid | 959   | Budesonide 50micrograms/dose inhaler  |
| Corticosteroid | 57931 | Hydrocortisone 20mg tablets (Teva UK Ltd)   |
| Corticosteroid | 60064 | Dexamethasone 10mg/5ml oral solution sugar free   |
| Corticosteroid | 71926 | Dexamethasone 1.25mg/5ml oral suspension  |
| Corticosteroid | 1680  | Pulmicort LS 50micrograms/dose inhaler (AstraZeneca UK Ltd)   |
| Corticosteroid | 909   | Budesonide 200micrograms/dose inhaler   |
| Corticosteroid | 15617 | Ledercort 4mg Tablet (Wyeth Pharmaceuticals)  |
| Corticosteroid | 8306  | Prednisolone 25mg/1ml suspension for injection ampoules<br>Betamethasone 500microgram soluble tablets sugar free (Alliance Healthcare (Distribution) Ltd) |
| Corticosteroid | 64235 |   |
| Corticosteroid | 51759 | Symbicort 200/6 Turbohaler (Mawdsley-Brooks & Company Ltd)  |
| Corticosteroid | 16525 | Budenofalk 3mg gastro-resistant capsules (Dr. Falk Pharma UK Ltd)   |
| Corticosteroid | 2390  | PREDNISOLONE E/C 1 MG TAB   |
| Corticosteroid | 3898  | Budesonide 3mg gastro-resistant modified-release capsules   |
| Corticosteroid | 2368  | Prednisolone 2.5mg tablet   |
| Corticosteroid | 54794 | Hydrocortisone 20mg modified-release tablets  |
| Corticosteroid | 16582 | Triamcinolone acetonide 40mg/ml suspension for injection  |
| Corticosteroid | 956   | Pulmicort 200 Turbohaler (AstraZeneca UK Ltd)   |

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| Corticosteroid | 28376 | Prednisolone 2.5mg Gastro-resistant tablet (Biorex Laboratories Ltd)   |
| Corticosteroid | 34404 | Prednisolone 1mg tablets (Accord Healthcare Ltd)   |
| Corticosteroid | 76020 | Prednisolone 2.5mg gastro-resistant tablets (Alliance Healthcare (Distribution) Ltd)   |
| Corticosteroid | 44802 | Lodotra 5mg modified-release tablets (Napp Pharmaceuticals Ltd)  |
| Corticosteroid | 55401 | Dexamethasone 500microgram tablets (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 5493  | Methylprednisolone acetate 40mg/ml Injection   |
| Corticosteroid | 50853 | Lederspan 20mg/1ml suspension for injection vials (Wyeth Pharmaceuticals)<br>Hydrocortisone 2.5mg muco-adhesive buccal tablets sugar free (Waymade Healthcare Plc) |
| Corticosteroid | 61791 | Healthcare Plc)  |
| Corticosteroid | 74493 | Prednisolone 5mg soluble tablets (Actavis UK Ltd)  |
| Corticosteroid | 63172 | Prednisolone 10mg tablets  |
| Corticosteroid | 37638 | Efcortisol 500mg/5ml solution for injection ampoules (Advanz Pharma)   |
| Corticosteroid | 1642  | Budesonide 400micrograms/dose dry powder inhaler   |
| Corticosteroid | 17263 | HYDROCORTISONE SODIUM PHOSPHATE 5 MG SOL   |
| Corticosteroid | 33131 | Triamcinolone acetonide 80mg/2ml suspension for injection pre-filled syringes  |
| Corticosteroid | 58234 | Prednisolone 10mg/5ml oral solution  |
| Corticosteroid | 35349 | Methylprednisolone acetate 80mg/2ml suspension for injection vials   |
| Corticosteroid | 13043 | Hydrocortone 20mg tablets (Auden McKenzie (Pharma Division) Ltd)   |
| Corticosteroid | 8864  | Adcortyl 10mg/ml Intraarticular / intradermal injection (E R Squibb and Sons Ltd)  |
| Corticosteroid | 59912 | Prednisolone 5mg gastro-resistant tablets (Waymade Healthcare Plc)   |
| Corticosteroid | 8628  | ALUMINIUM ACETATE /HYDROCORT.ACETATE /LI 50 MG SUP   |
| Corticosteroid | 2181  | METHYLPREDNISOLONE/LIGNOCAINE HCL (1ML) 40 MG/ML INJ   |
| Corticosteroid | 35172 | Efcortisol 100mg/1ml solution for injection ampoules (Advanz Pharma)   |
| Corticosteroid | 73999 | Pulmicort 0.5mg Respules (Sigma Pharmaceuticals Plc)   |
| Corticosteroid | 3969  | DEXAMETHASONE 8 MG TAB   |
| Corticosteroid | 38407 | Prednisolone 20mg tablet   |
| Corticosteroid | 25077 | DEPO-MEDRONE 40MG/ML (3ML)<br>DuoResp Spiromax 160micrograms/dose / 4.5micrograms/dose dry powder inhaler (Teva UK Ltd)  |
| Corticosteroid | 61782 | (Teva UK Ltd)  |
| Corticosteroid | 15555 | Medrone 4mg tablets (Pfizer Ltd)   |
| Corticosteroid | 5913  | Deltacortril 2.5mg gastro-resistant tablets (Phoenix Labs Ltd)   |
| Corticosteroid | 67322 | Pulmicort 100 Turbohaler (Waymade Healthcare Plc)  |
| Corticosteroid | 61689 | Prednisolone 5mg soluble tablets (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 68034 | Symbicort 200/6 Turbohaler (Necessity Supplies Ltd)  |
| Corticosteroid | 6098  | Hydrocortone 10mg tablets (Auden McKenzie (Pharma Division) Ltd)   |
| Corticosteroid | 28215 | Dexamethasone 100mg/5ml solution for injection vials   |
| Corticosteroid | 77085 | Dexamethasone 16mg/5ml oral solution   |
| Corticosteroid | 28375 | Prednisolone 2.5mg gastro-resistant tablets (A A H Pharmaceuticals Ltd)  |
| Corticosteroid | 3570  | Budesonide 200micrograms/actuation refill canister   |
| Corticosteroid | 63549 | Prednisolone 1mg/ml oral solution (Logixx Pharma Solutions Ltd)  |
| Corticosteroid | 50854 | Lederspan 100mg/5ml suspension for injection vials (Wyeth Pharmaceuticals)   |
| Corticosteroid | 52053 | Hydrocortisone 3mg/5ml oral suspension   |
| Corticosteroid | 70893 | Dexamethasone 40mg tablets   |
| Corticosteroid | 7013  | Symbicort 100/6 Turbohaler (AstraZeneca UK Ltd)  |
| Corticosteroid | 9117  | METHYLPREDNISOLONE 40 MG/ML INJ  |
| Corticosteroid | 10754 | Hydrocortistab 20mg Tablet (Waymade Healthcare Plc)  |

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| Corticosteroid | 27413 | Depo-Medrone 80mg/2ml suspension for injection vials (Pfizer Ltd)   |
| Corticosteroid | 44803 | Lodotra 2mg modified-release tablets (Napp Pharmaceuticals Ltd)   |
| Corticosteroid | 67261 | Pulmicort 1mg Respules (Sigma Pharmaceuticals Plc)  |
| Corticosteroid | 65448 | Budesonide 1mg/2ml nebuliser liquid unit dose vials (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 3059  | PREDNISOLONE 50 MG TAB  |
| Corticosteroid | 66327 | Hydrocortisone 20mg tablets (Accord Healthcare Ltd)   |
| Corticosteroid | 72421 | Prednisolone 1mg gastro-resistant tablets (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 578   | Prednisolone 1mg tablets  |
| Corticosteroid | 60937 | Pulmicort 200 Turbohaler (Dowelhurst Ltd)   |
| Corticosteroid | 74436 | Dexamethasone 500micrograms/5ml oral suspension   |
| Corticosteroid | 24224 | Codelsol 16mg/ml Injection (MSD Thomas Morson Pharmaceuticals)  |
| Corticosteroid | 75001 | Prednisolone 1mg tablets (DE Pharmaceuticals)   |
| Corticosteroid | 17101 | DEXAMETHASONE 750 MCG TAB   |
| Corticosteroid | 71347 | Pulmicort 400 Turbohaler (Sigma Pharmaceuticals Plc)  |
| Corticosteroid | 1280  | Dexamethasone 2mg tablets   |
| Corticosteroid | 21465 | BETAMETHASONE .1 MG TAB   |
| Corticosteroid | 68593 | Dexamethasone 5mg/5ml oral suspension<br>Methylprednisolone sodium succinate 125mg powder and solvent for solution for injection vials  |
| Corticosteroid | 18266 | injection vials   |
| Corticosteroid | 18042 | Medrone 100mg tablets (Pfizer Ltd)  |
| Corticosteroid | 51871 | Hydrocortisone 2mg capsules   |
| Corticosteroid | 71620 | Hydrocortisone 7mg/5ml oral suspension  |
| Corticosteroid | 35602 | Budesonide 200micrograms/dose dry powder inhalation cartridge   |
| Corticosteroid | 74239 | Prednisolone 15mg/5ml oral solution   |
| Corticosteroid | 6780  | Symbicort 400/12 Turbohaler (AstraZeneca UK Ltd)<br>Solu-Medrone 500mg powder and solvent for solution for injection vials (Pfizer Ltd) |
| Corticosteroid | 21540 | Ltd)  |
| Corticosteroid | 47142 | Prednisolone 5mg Soluble tablet (Amdipharm Plc)   |
| Corticosteroid | 49711 | Pulmicort 200micrograms/dose inhaler (AstraZeneca UK Ltd)   |
| Corticosteroid | 186   | Dexamethasone 500micrograms/5ml oral solution   |
| Corticosteroid | 18660 | Deltastab 25mg/1ml suspension for injection ampoules (Advanz Pharma)  |
| Corticosteroid | 39099 | Pulmicort 100micrograms/dose inhaler CFC free (AstraZeneca UK Ltd)  |
| Corticosteroid | 56144 | Budenofalk 9mg gastro-resistant granules sachets (Dr. Falk Pharma UK Ltd)   |
| Corticosteroid | 22501 | HYDROCORTISONE 1%/MICONAZOLE NITRATE 2%   |
| Corticosteroid | 26667 | DEPO-MEDRONE WITH LIDOCAINE (1ML)   |
| Corticosteroid | 43544 | Prednisone 5mg Tablet (Knoll Ltd)   |
| Corticosteroid | 34801 | Dexamethasone 0.5mg/5ml Oral solution (Rosemont Pharmaceuticals Ltd)  |
| Corticosteroid | 75937 | Hydrocortisone 2mg granules in capsules for opening   |
| Corticosteroid | 75729 | Hydrocortisone 5mg/5ml oral suspension sugar free (Special Order)   |
| Corticosteroid | 51849 | Hydrocortisone 1mg/5ml oral suspension  |
| Corticosteroid | 47225 | Budesonide 9mg gastro-resistant granules sachets  |
| Corticosteroid | 51753 | Prednisolone 1mg tablets (Strides Pharma UK Ltd)  |
| Corticosteroid | 24014 | Ledercort 2mg Tablet (Wyeth Pharmaceuticals)  |
| Corticosteroid | 74817 | Symbicort 200/6 Turbohaler (Waymade Healthcare Plc)<br>Kenalog Intramuscular 80mg/2ml suspension for injection pre-filled syringes      |
| Corticosteroid | 22047 | (Bristol-Myers Squibb Pharmaceuticals Ltd)  |

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| Corticosteroid | 18765 | Methylprednisolone sodium succinate 40mg powder and solvent for solution for injection vials   |
| Corticosteroid | 48748 | Depo-Medrone 40mg/1ml suspension for injection vials (Lexon (UK) Ltd)  |
| Corticosteroid | 51824 | Hydrocortisone 5mg/5ml oral suspension sugar free  |
| Corticosteroid | 32835 | Prednisolone 5mg tablets (Wockhardt UK Ltd)  |
| Corticosteroid | 34109 | Prednisolone 5 mg gastro-resistant tablet  |
| Corticosteroid | 64416 | Prednisolone 10mg/ml oral solution sugar free  |
| Corticosteroid | 35510 | Budesonide 200micrograms/dose dry powder inhalation cartridge with device  |
| Corticosteroid | 955   | Prednisolone 5mg soluble tablets   |
| Corticosteroid | 63893 | Budesonide 9mg modified-release tablets  |
| Corticosteroid | 49498 | Hydrocortisone sodium succinate 100mg powder for solution for injection vials  |
| Corticosteroid | 67107 | Prednisolone 5mg gastro-resistant tablets (Phoenix Labs Ltd)   |
| Corticosteroid | 22434 | Hydrocortisone acetate Powder  |
| Corticosteroid | 20157 | Depo-Medrone with Lidocaine suspension for injection 2ml vials (Pfizer Ltd)  |
| Corticosteroid | 54432 | Lodotra 1mg modified-release tablets (Napp Pharmaceuticals Ltd)  |
| Corticosteroid | 72848 | Glensoludex 2mg soluble tablets (Glenmark Pharmaceuticals Europe Ltd)  |
| Corticosteroid | 41745 | Prednisolone 25mg tablets (Zentiva)  |
| Corticosteroid | 44    | Prednisolone 5mg gastro-resistant tablets  |
| Corticosteroid | 23118 | TRIAMCINOLONE 10 MG INJ  |
| Corticosteroid | 24660 | BETAMETHASONE VALERATE   |
| Corticosteroid | 16054 | Budesonide 200micrograms/actuation breath actuated powder inhaler<br>Hydrocortisone sodium succinate 100mg powder and solvent for solution for injection vials |
| Corticosteroid | 49707 |  |
| Corticosteroid | 8261  | Medrone 16mg tablets (Pfizer Ltd)  |
| Corticosteroid | 51997 | Budesonide 9mg gastro-resistant granules sachets   |
| Corticosteroid | 21833 | Decortisyl 5mg Tablet (Roussel Laboratories Ltd)   |
| Corticosteroid | 19032 | HYDROCORTISONE SODIUM SUCCINATE POW  |
| Corticosteroid | 50739 | Symbicort 400/12 Turbohaler (Mawdsley-Brooks & Company Ltd)  |
| Corticosteroid | 65020 | Prednisolone 25mg/5ml oral solution  |
| Corticosteroid | 35040 | Depo-Medrone 120mg/3ml suspension for injection vials (Pfizer Ltd)   |
| Corticosteroid | 18955 | HYDROCORTISONE 4.5 MG LOZ  |
| Corticosteroid | 66645 | Prednisolone 5mg/5ml oral solution unit dose (Logixx Pharma Solutions Ltd)   |
| Corticosteroid | 38054 | Hydrocortisone Tablet  |
| Corticosteroid | 50026 | Triamcinolone acetonide 40mg/1ml suspension for injection pre-filled syringes  |
| Corticosteroid | 9574  | Hydrocortisone na phosphate 100mg/ml Injection   |
| Corticosteroid | 64128 | Pevanti 5mg tablets (Advanz Pharma)  |
| Corticosteroid | 58061 | Prednisone 50mg tablets  |
| Corticosteroid | 13615 | PREDNISONONE 10 MG TAB   |
| Corticosteroid | 46711 | Prednisone 2mg modified-release tablets  |
| Corticosteroid | 67512 | Hydrocortisone 4mg pastilles   |
| Corticosteroid | 2949  | Prednisone 5mg tablets   |
| Corticosteroid | 34978 | Prednisolone 1mg tablets (Wockhardt UK Ltd)  |
| Corticosteroid | 53313 | Prednisolone 20mg/5ml oral suspension  |
| Corticosteroid | 30805 | BETAMETHASONE VALERATE PEL   |
| Corticosteroid | 61162 | Prednisolone 5mg tablets (Waymade Healthcare Plc)  |
| Corticosteroid | 2799  | PREDNISOLONE 10 MG TAB   |



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| Corticosteroid | 5118  | Hydrocortisone na succinate 2.5mg Lozenge  |
| Corticosteroid | 44723 | Prednisone 5mg modified-release tablets  |
| Corticosteroid | 34452 | Prednisolone 1mg tablets (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 64009 | Pevanti 20mg tablets (Advanz Pharma)   |
| Corticosteroid | 65984 | Hydrocortisone 10mg tablets (Accord Healthcare Ltd)  |
| Corticosteroid | 2092  | Budesonide 200micrograms/dose dry powder inhaler   |
| Corticosteroid | 15717 | Betamethasone 4mg/1ml solution for injection ampoules  |
| Corticosteroid | 69686 | Pevanti 25mg tablets (Advanz Pharma)   |
| Corticosteroid | 52396 | Dexamethasone 1mg/5ml oral solution  |
| Corticosteroid | 61132 | Prednisolone 1mg tablets (Boston Healthcare Ltd)   |
| Corticosteroid | 23599 | NYSTATIN 100 000u/TRIAMCINOLONE ACET.0.1   |
| Corticosteroid | 60120 | Dexamethasone 2mg tablets (Alliance Healthcare (Distribution) Ltd)   |
| Corticosteroid | 22827 | BETAMETHASONE .1 MG PEL  |
| Corticosteroid | 7934  | PREDNISON 30 MG TAB  |
| Corticosteroid | 28615 | METHYLPREDNISOLONE L/A 4 MG CAP  |
| Corticosteroid | 48800 | Depo-Medrone 40mg/1ml suspension for injection vials (DE Pharmaceuticals)  |
| Corticosteroid | 50945 | Symbicort 100/6 Turbohaler (Mawdsley-Brooks & Company Ltd)   |
| Corticosteroid | 33691 | Prednisolone 5mg Gastro-resistant tablet (Biorex Laboratories Ltd)   |
| Corticosteroid | 33988 | Prednisolone 5mg Tablet (Co-Pharma Ltd)  |
| Corticosteroid | 58000 | Prednisolone 5mg tablets (Almus Pharmaceuticals Ltd)   |
| Corticosteroid | 67559 | Prednisolone 5mg/5ml oral solution unit dose (A A H Pharmaceuticals Ltd)   |
| Corticosteroid | 7724  | Betamethasone valerate 100micrograms/actuation inhaler<br>Fobumix Easyhaler 160micrograms/dose / 4.5micrograms/dose dry powder inhaler |
| Corticosteroid | 71915 | (Orion Pharma (UK) Ltd)  |
| Corticosteroid | 13952 | Decadron 4mg/ml Injection (MSD Thomas Morson Pharmaceuticals)  |
| Corticosteroid | 35578 | Triamcinolone acetonide 50mg/5ml suspension for injection vials  |
| Corticosteroid | 64787 | Hydrocortisone 10mg tablets (Almus Pharmaceuticals Ltd)  |
| Corticosteroid | 30971 | DECORTISYL 25 MG TAB   |
| Corticosteroid | 66666 | Hydrocortisone 10mg tablets (Teva UK Ltd)  |
| Corticosteroid | 19009 | DEXACORTISYL 2 MG TAB  |
| Corticosteroid | 10704 | EFCORTELAN 25 MG INJ<br>Fobumix Easyhaler 320micrograms/dose / 9micrograms/dose dry powder inhaler                                     |
| Corticosteroid | 71284 | (Orion Pharma (UK) Ltd)  |
| Corticosteroid | 74502 | Alkindi 1mg granules in capsules for opening (Diurnal Ltd)   |
| Corticosteroid | 11123 | Triamcinolone acetonide 10mg/ml IA/ID  |
| Corticosteroid | 64747 | Dexamethasone 2mg/5ml oral solution  |
| Corticosteroid | 7788  | Budesonide 100micrograms/dose dry powder inhaler   |
| Corticosteroid | 40749 | DEXAMETHASONE SODIUM PHOSPHATE 5 MG INJ  |
| Corticosteroid | 34631 | Prednisolone 1mg Tablet (Co-Pharma Ltd)<br>Budesonide 400micrograms/dose / Formoterol 12micrograms/dose dry powder                     |
| Corticosteroid | 6746  | inhaler  |
| Corticosteroid | 68182 | Dexamethasone 2mg tablets (Teva UK Ltd)  |
| Corticosteroid | 64050 | Martapan 2mg/5ml oral solution (Martindale Pharmaceuticals Ltd)  |
| Corticosteroid | 59229 | Dilacort 5mg gastro-resistant tablets (Auden McKenzie (Pharma Division) Ltd)   |
| Corticosteroid | 34914 | Prednisolone 1mg Tablet (Celltech Pharma Europe Ltd)   |
| Corticosteroid | 10864 | Betamethasone 500microgram tablets   |

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| Corticosteroid | 52732 | Pulmicort 0.5mg Respules (Necessity Supplies Ltd)   |
| Corticosteroid | 46280 | Hydrocortisone 2.5mg muco-adhesive buccal tablets sugar free (Accord Healthcare Ltd)  |
| Corticosteroid | 67677 | Symbicort 200micrograms/dose / 6micrograms/dose pressurised inhaler (AstraZeneca UK Ltd)  |
| Corticosteroid | 34660 | Prednisolone 1mg tablets (Kent Pharmaceuticals Ltd)   |
| Corticosteroid | 9368  | Triamcinolone acetonide 10mg/ml IA/ID   |
| Corticosteroid | 45234 | Dexamethasone 100microgram capsules   |
| Corticosteroid | 19141 | Prednisolone 5mg soluble tablets (Advanz Pharma)  |
| Corticosteroid | 10552 | Methylprednisolone 16mg tablets   |
| Corticosteroid | 39879 | Budesonide 200micrograms/dose inhaler CFC free<br>Budesonide 100micrograms/dose / Formoterol 6micrograms/dose dry powder inhaler  |
| Corticosteroid | 10218 |   |
| Corticosteroid | 76339 | Dexamethasone 10mg/5ml oral suspension  |
| Corticosteroid | 26806 | DECADRON 2 MG TAB   |
| Corticosteroid | 26691 | DEPO-MEDRONE (2ML)  |
| Corticosteroid | 26299 | Oradexon-organon 4mg/ml Intraarticular injection (Organon Laboratories Ltd)   |
| Corticosteroid | 56319 | Hydrocortisone 2.5mg muco-adhesive buccal tablets sugar free (A A H Pharmaceuticals Ltd)<br>Hydrocortisone 2.5mg muco-adhesive buccal tablets sugar free (Alliance Healthcare (Distribution) Ltd) |
| Corticosteroid | 72487 |   |
| Corticosteroid | 3703  | Kenalog 80mg/2ml Intramuscular injection (E R Squibb and Sons Ltd)  |
| Corticosteroid | 73553 | Prednisolone 1mg tablets (Alliance Healthcare (Distribution) Ltd)   |
| Corticosteroid | 95    | Prednisolone 5mg tablets  |
| Corticosteroid | 54434 | Prednisolone 2.5mg/5ml oral suspension<br>Kenalog Intramuscular 40mg/1ml suspension for injection pre-filled syringes (Bristol-Myers Squibb Pharmaceuticals Ltd)                                  |
| Corticosteroid | 50216 |   |
| Corticosteroid | 3557  | Prednisone 1mg tablets  |
| Corticosteroid | 40057 | Pulmicort 200micrograms/dose inhaler CFC free (AstraZeneca UK Ltd)  |
| Corticosteroid | 67239 | Pulmicort 400 Turbohaler (Waymade Healthcare Plc)   |
| Corticosteroid | 6339  | Hydrocortisone 2.5mg muco-adhesive buccal tablets sugar free  |
| Corticosteroid | 14076 | Hydrocortisone 5mg/5ml Oral solution  |
| Corticosteroid | 7710  | PREDNISOLONE 15 MG TAB  |
| Corticosteroid | 27889 | PREDNISOLONE<br>Solu-Medrone 125mg powder and solvent for solution for injection vials (Pfizer Ltd)   |
| Corticosteroid | 25226 |   |
| Corticosteroid | 67076 | Prednisolone 20mg/5ml oral solution   |
| Corticosteroid | 58369 | Prednisolone 5mg tablets (Boston Healthcare Ltd)  |
| Corticosteroid | 20577 | Calcort 6mg Tablet (Shire Pharmaceuticals Ltd)  |
| Corticosteroid | 7992  | Lederspan 5mg/ml Injection (Wyeth Pharmaceuticals)  |
| Corticosteroid | 56891 | Prednisolone 1mg tablets (Waymade Healthcare Plc)   |
| Corticosteroid | 74574 | Budesonide 1mg orodispersible tablets sugar free  |
| Corticosteroid | 66914 | Prednisolone 1mg gastro-resistant tablets   |
| Corticosteroid | 59283 | Dilacort 2.5mg gastro-resistant tablets (Auden McKenzie (Pharma Division) Ltd)  |
| Corticosteroid | 54118 | Prednisolone 25mg/5ml oral suspension   |
| Corticosteroid | 8433  | Budesonide 100micrograms/actuation inhaler  |
| Corticosteroid | 74083 | Pulmicort 100 Turbohaler (Sigma Pharmaceuticals Plc)  |

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| Corticosteroid | 71427 | Budesonide 100micrograms/dose Turbohaler (Dowelhurst Ltd)                                      |
| Corticosteroid | 71404 | Dexamethasone 2mg/5ml oral solution sugar free (Waymade Healthcare Plc)                        |
| Corticosteroid | 55024 | Prednisolone 5mg/5ml oral solution   |
| Corticosteroid | 10657 | Dexamethasone sodium phosphate 4mg/ml intra-artic injection                                    |
| Corticosteroid | 58592 | Plenadren 20mg modified-release tablets (Shire Pharmaceuticals Ltd)                            |
| Corticosteroid | 7584  | PREDNISOLONE 4 MG TAB  |
| Corticosteroid | 4943  | Dexamethasone 2mg/5ml oral solution sugar free   |
| Corticosteroid | 947   | Budesonide 50micrograms/actuation refill canister  |
| Corticosteroid | 56347 | Dexamethasone 5mg/5ml oral solution  |
| Corticosteroid | 12398 | Cortelan 25mg Tablet (Glaxo Laboratories Ltd)  |
| Corticosteroid | 74832 | Symbicort 400/12 Turbohaler (Sigma Pharmaceuticals Plc)  |
| Corticosteroid | 4125  | Triamcinolone acetonide 80mg/2ml intramuscular injection                                       |
| Corticosteroid | 50037 | Pulmicort 0.5mg Respules (Waymade Healthcare Plc)  |
| Corticosteroid | 22555 | Calcort 1mg tablets (Shire Pharmaceuticals Ltd)  |
| Corticosteroid | 75019 | Hydrocortisone 1mg granules in capsules for opening  |
| Corticosteroid | 74041 | Pulmicort 400 Turbohaler (DE Pharmaceuticals)  |
| Corticosteroid | 74045 | Pulmicort 100 Turbohaler (Mawdsley-Brooks & Company Ltd)                                       |
| Corticosteroid | 64059 | Hydrocortisone 2.5mg/5ml oral suspension   |
| Corticosteroid | 4257  | HYDROCORTISONE 100 MG INJ  |
| Corticosteroid | 29112 | Calcort 30mg tablets (Shire Pharmaceuticals Ltd)   |
| Corticosteroid | 44380 | Prednisone 1mg modified-release tablets  |
| Corticosteroid | 71368 | Pulmicort 200 Turbohaler (Lexon (UK) Ltd)  |
| Corticosteroid | 27083 | BETAMETHASONE VALERATE .1 MG TAB   |
| Corticosteroid | 22894 | HYDROCORTISONE 4 MG PAS  |
| Corticosteroid | 19562 | DEPO-MEDRONE (1ML)   |
| Corticosteroid | 11149 | Betnelan 500microgram tablets (Focus Pharmaceuticals Ltd)                                      |
| Corticosteroid | 26454 | Decadron 4mg/ml Injection (MSD Thomas Morson Pharmaceuticals)                                  |
| Corticosteroid | 34880 | Dexamethasone 2mg tablets (Aspen Pharma Trading Ltd)   |
| Corticosteroid | 3345  | Sintisone Tablet (Pharmacia Ltd)   |
| Corticosteroid | 13397 | Methylprednisolone sodium succinate 1g powder and solvent for solution for injection vials     |
| Corticosteroid | 64008 | Pevanti 2.5mg tablets (Advanz Pharma)  |
| Corticosteroid | 75065 | Alkindi 2mg granules in capsules for opening (Diurnal Ltd)                                     |
| Corticosteroid | 3651  | Solu-cortef 100mg/vial Injection (Pharmacia Ltd)   |
| Corticosteroid | 23656 | HYDROCORTISONE ACETATE + INSUFFLATOR   |
| Corticosteroid | 53953 | Hydrocortisone 5mg modified-release tablets  |
| Corticosteroid | 37500 | Dexamethasone (base) 6.6mg/2ml solution for injection vials                                    |
| Corticosteroid | 27959 | PREDNISOLONE   |
| Corticosteroid | 26408 | DEXAMETHASONE ACETATE INSUFFLATOR OUTFIT   |
| Corticosteroid | 35154 | Methylprednisolone 80mg/2ml / Lidocaine 20mg/2ml (1%) suspension for injection vials           |
| Corticosteroid | 960   | Pulmicort 100 Turbohaler (AstraZeneca UK Ltd)  |
| Corticosteroid | 13981 | Adcortyl 10mg/ml Intradermal injection (E R Squibb and Sons Ltd)                               |
| Corticosteroid | 50734 | Depo-Medrone with Lidocaine suspension for injection 1ml vials (Mawdsley-Brooks & Company Ltd) |
| Corticosteroid | 11334 | Dexamethasone sodium phosphate iv 4mg/ml injection   |

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| Corticosteroid | 9727  | Prednisolone 50mg tablets  |
| Corticosteroid | 4687  | Methylprednisolone acetate with lidocaine 40mg/ml + 10mg/ml Injection                      |
| Corticosteroid | 27188 | Easyhaler Budesonide 200micrograms/dose dry powder inhaler (Orion Pharma (UK) Ltd)         |
| Corticosteroid | 73216 | Dexamethasone 8mg tablets  |
| Corticosteroid | 63066 | Prednisolone 2.5mg tablets   |
| Corticosteroid | 2704  | Prednisolone 25mg tablets  |
| Corticosteroid | 3754  | Hydrocortisone na succinate 100mg/vial Injection   |
| Corticosteroid | 34461 | Prednisolone 2.5mg gastro-resistant tablets (Accord Healthcare Ltd)                        |
| Corticosteroid | 4779  | Dexamethasone 500microgram tablets   |
| Corticosteroid | 1893  | Hydrocortistab 25mg/1ml suspension for injection ampoules (Advanz Pharma)                  |
| Corticosteroid | 3418  | Hydrocortisone 10mg tablets  |
| Corticosteroid | 75234 | Jorveza 1mg orodispersible tablets (Dr. Falk Pharma UK Ltd)                                |
| Corticosteroid | 51722 | Hydrocortisone 5mg/5ml oral suspension   |
| Corticosteroid | 66200 | Dexamethasone 2mg soluble tablets sugar free   |
| Corticosteroid | 31327 | Prednisolone steaglate 6.65mg tablet   |
| Corticosteroid | 24636 | DEXAMETHASONE .5 MG INH  |
| Corticosteroid | 58384 | Prednisolone 1mg tablets (Almus Pharmaceuticals Ltd)                                       |
| Corticosteroid | 35631 | Budelin Novolizer 200micrograms/dose inhalation powder (Mylan)                             |
| Corticosteroid | 66550 | Prednisolone 5mg gastro-resistant tablets (Alliance Healthcare (Distribution) Ltd)         |
| Corticosteroid | 14172 | Methylprednisolone 100mg tablets   |
| Corticosteroid | 20095 | Precortisyl forte 25mg Tablet (Aventis Pharma)   |
| Corticosteroid | 75020 | Hydrocortisone 500microgram granules in capsules for opening                               |
| Corticosteroid | 13522 | PREDNISOLONE 2 MG TAB  |
| Corticosteroid | 68497 | Prednisolone 2.5mg gastro-resistant tablets (Waymade Healthcare Plc)                       |
| Corticosteroid | 74791 | Pulmicort 400 Turbohaler (Mawdsley-Brooks & Company Ltd)                                   |
| Corticosteroid | 66524 | Dexamethasone 4mg soluble tablets sugar free   |
| Corticosteroid | 53237 | Symbicort 400/12 Turbohaler (DE Pharmaceuticals)   |
| Corticosteroid | 14958 | Triamcinolone acetonide 10mg/1ml suspension for injection ampoules                         |
| Corticosteroid | 66287 | Dexamethasone 8mg soluble tablets sugar free   |
| Corticosteroid | 4801  | Budesonide 500micrograms/2ml nebuliser liquid unit dose vials                              |
| Corticosteroid | 70749 | Budesonide 400micrograms/dose Turbohaler (Dowelhurst Ltd)                                  |
| Corticosteroid | 59338 | Prednisolone 1mg/5ml oral solution   |
| Corticosteroid | 41515 | Prednisolone 5mg tablets (Teva UK Ltd)   |
| Corticosteroid | 33132 | Methylprednisolone acetate 40mg/1ml suspension for injection vials                         |
| Corticosteroid | 1063  | Prednesol 5mg Tablet (Sovereign Medical Ltd)   |
| Corticosteroid | 12405 | Methylprednisolone sodium succinate 2g powder and solvent for solution for injection vials |
| Corticosteroid | 51872 | Hydrocortisone 2.5mg capsules  |
| Corticosteroid | 41335 | Calcort 6mg tablets (Sanofi)   |
| Corticosteroid | 13972 | Dexamethasone sodium phosphate 5mg/ml injection  |
| Corticosteroid | 64007 | Pevanti 10mg tablets (Advanz Pharma)   |
| Corticosteroid | 69572 | Dexamethasone 4mg/5ml oral suspension  |
| Corticosteroid | 21417 | Prednisolone 5mg tablets (A A H Pharmaceuticals Ltd)                                       |
| Corticosteroid | 54715 | Solu-Cortef 100mg powder for solution for injection vials (Pfizer Ltd)                     |
| Corticosteroid | 31532 | Prednisolone 5mg gastro-resistant tablets (A A H Pharmaceuticals Ltd)                      |

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| Corticosteroid  | 24716 | PREDNISOLONE E/C   |
| Corticosteroid  | 65626 | Prednisolone 10mg/5ml oral suspension  |
| Corticosteroid  | 45302 | Prednisolone 5mg Tablet (Biorex Laboratories Ltd)  |
| Corticosteroid  | 56498 | Pulmicort 200 Turbohaler (Waymade Healthcare Plc)  |
| Corticosteroid  | 34393 | Prednisolone 5mg gastro-resistant tablets (Teva UK Ltd)  |
| Corticosteroid  | 68489 | Dexamethasone 4mg tablets  |
| Corticosteroid  | 25272 | Precortisyl 1mg Tablet (Hoechst Marion Roussel)<br>Adcortyl Intra-articular / Intradermal 10mg/1ml suspension for injection ampoules |
| Corticosteroid  | 14335 | (Bristol-Myers Squibb Pharmaceuticals Ltd)   |
| Corticosteroid  | 30390 | DELTA TAB 2 MG TAB   |
| Corticosteroid  | 24657 | PREDNISOLONE PIVALATE 50 MG INJ  |
| Corticosteroid  | 60421 | Prednisolone 5mg tablets (Strides Pharma UK Ltd)   |
| Corticosteroid  | 35175 | Hydrocortisone sodium phosphate 100mg/1ml solution for injection ampoules  |
| Corticosteroid  | 17797 | METHYLPREDNISOLONE/LIGNOCAINE HCL (2ML) 40 MG/ML INJ   |
| Corticosteroid  | 67507 | Prednisolone 30mg tablets  |
| Corticosteroid  | 68103 | Dexamethasone 2mg soluble tablets sugar free (A A H Pharmaceuticals Ltd)   |
| Corticosteroid  | 62909 | Dexamethasone 2mg tablets (A A H Pharmaceuticals Ltd)<br>Fobumix Easyhaler 80micrograms/dose / 4.5micrograms/dose dry powder inhaler |
| Corticosteroid  | 72400 | (Orion Pharma (UK) Ltd)  |
| Corticosteroid  | 6325  | Symbicort 200/6 Turbohaler (AstraZeneca UK Ltd)  |
| Corticosteroid  | 925   | Depo-medrone with lidocaine 40mg/ml+10mg/ml Injection (Pharmacia Ltd)  |
| Corticosteroid  | 35724 | Budelin Novolizer 200micrograms/dose inhalation powder refill (Mylan)  |
| Corticosteroid  | 51167 | Solu-Cortef 100mg powder and solvent for solution for injection vials (Pfizer Ltd)   |
| Corticosteroid  | 63791 | Prednisolone 5mg/5ml oral solution unit dose   |
| Corticosteroid  | 56443 | Dexamethasone 10mg/5ml oral solution   |
| Corticosteroid  | 1956  | Pulmicort 1mg Respules (AstraZeneca UK Ltd)  |
| Corticosteroid  | 4545  | Pulmicort LS 50microgram Refill canister (AstraZeneca UK Ltd)  |
| Corticosteroid  | 68306 | Betamethasone 500microgram soluble tablets sugar free (RPH Pharmaceuticals AB)   |
| Corticosteroid  | 70603 | Prednisolone 5mg soluble tablets (Focus Pharmaceuticals Ltd)   |
| Fluoroquinolone | 73464 | Levofloxacin 500mg tablets (Mylan)   |
| Fluoroquinolone | 81446 | Ciproxin 250mg tablets (Dowelhurst Ltd)  |
| Fluoroquinolone | 78601 | Quinsair 240mg nebuliser solution ampoules (Chiesi Ltd)  |
| Fluoroquinolone | 58608 | Ciprofloxacin 100mg tablets (Bristol Laboratories Ltd)   |
| Fluoroquinolone | 10304 | Ciprofloxacin 2mg/ml infusion  |
| Fluoroquinolone | 43557 | Ciprofloxacin 500mg tablets (PLIVA Pharma Ltd)   |
| Fluoroquinolone | 79288 | Ciprofloxacin 500mg tablets (Nexcape Pharmaceuticals Ltd)  |
| Fluoroquinolone | 32530 | Ciproxin iv flexibag 400mg/200ml Infusion (Bayer Plc)  |
| Fluoroquinolone | 67656 | Ciprofloxacin 500mg tablets (Bristol Laboratories Ltd)   |
| Fluoroquinolone | 71582 | Ciproxin 250mg/5ml oral suspension (Lexon (UK) Ltd)  |
| Fluoroquinolone | 53519 | Ciproxin 250mg tablets (Lexon (UK) Ltd)  |
| Fluoroquinolone | 40252 | Ofloxacin 200mg/100ml solution for infusion bottles  |
| Fluoroquinolone | 81005 | Moxifloxacin 400mg tablets (Rivopharm (UK) Ltd)  |
| Fluoroquinolone | 9154  | Ciproxin 100mg tablets (Bayer Plc)   |
| Fluoroquinolone | 57703 | Ciprofloxacin 200mg/100ml solution for infusion bottles  |
| Fluoroquinolone | 7752  | Ciproxin 750mg tablets (Bayer Plc)   |
| Fluoroquinolone | 54393 | Ciprofloxacin 250mg tablets (Arrow Generics Ltd)   |

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| Fluoroquinolone | 76099 | Ofloxacin 200mg tablets (A A H Pharmaceuticals Ltd)   |
| Fluoroquinolone | 66211 | Levofloxacin 500mg/100ml solution for infusion bottles  |
| Fluoroquinolone | 56075 | Levofloxacin 500mg/100ml solution for infusion vials  |
| Fluoroquinolone | 56856 | Ciprofloxacin 750mg tablets (Ranbaxy (UK) Ltd)  |
| Fluoroquinolone | 80218 | Ciprofloxacin 500mg tablets (Phoenix Healthcare Distribution Ltd)   |
| Fluoroquinolone | 34308 | Ciprofloxacin 250mg tablets (Actavis UK Ltd)  |
| Fluoroquinolone | 34494 | Ciprofloxacin 500mg tablets (Wockhardt UK Ltd)  |
| Fluoroquinolone | 73859 | Levofloxacin 100mg/ml nebuliser liquid ampoules   |
| Fluoroquinolone | 48031 | Ciprofloxacin 100mg tablets (Almus Pharmaceuticals Ltd)   |
| Fluoroquinolone | 54663 | Ciproxin 200mg/100ml solution for infusion bottles (Bayer Plc)  |
| Fluoroquinolone | 14376 | Ciproxin 2mg/ml Infusion (Bayer Plc)  |
| Fluoroquinolone | 57960 | Ciprofloxacin 500mg tablets (Tillomed Laboratories Ltd)   |
| Fluoroquinolone | 17693 | Tavanic 250mg tablets (Sanofi)  |
| Fluoroquinolone | 4091  | Ciprofloxacin 250mg/5ml oral suspension   |
| Fluoroquinolone | 49839 | Ciproxin 500mg tablets (Waymade Healthcare Plc)   |
| Fluoroquinolone | 28544 | Ciprofloxacin 400mg/200ml in glucose 5% infusion  |
| Fluoroquinolone | 58940 | Levofloxacin 250mg tablets (A A H Pharmaceuticals Ltd)  |
| Fluoroquinolone | 75298 | Levofloxacin 250mg tablets (Macleods Pharma UK Ltd)   |
| Fluoroquinolone | 47995 | Avelox 400mg/250ml solution for infusion bottles (Bayer Plc)  |
| Fluoroquinolone | 64991 | Levofloxacin 500mg tablets (Accord Healthcare Ltd)  |
| Fluoroquinolone | 2726  | Tarivid 400mg tablets (Sanofi)  |
| Fluoroquinolone | 59937 | Ciprofloxacin 750mg tablets (Accord Healthcare Ltd)   |
| Fluoroquinolone | 33707 | Ofloxacin 400mg tablets (Teva UK Ltd)   |
| Fluoroquinolone | 54555 | Ciprofloxacin 100mg tablets (DE Pharmaceuticals)  |
| Fluoroquinolone | 55917 | Ciprofloxacin 500mg tablets (Medreich Plc)  |
| Fluoroquinolone | 39913 | Ciprofloxacin 100mg tablets (Sandoz Ltd)  |
| Fluoroquinolone | 54674 | Ciprofloxacin 100mg tablets (Phoenix Healthcare Distribution Ltd)<br>Ciprofloxacin 400mg/200ml solution for infusion bottles (Kent Pharmaceuticals Ltd) |
| Fluoroquinolone | 69893 | Ciprofloxacin 500mg tablets (APC Pharmaceuticals & Chemicals (Europe) Ltd)  |
| Fluoroquinolone | 52309 | Ciprofloxacin 100mg tablets (Sigma Pharmaceuticals Plc)   |
| Fluoroquinolone | 5238  | Levofloxacin 500mg tablets  |
| Fluoroquinolone | 70998 | Ciprofloxacin 100mg/5ml oral suspension (Special Order)   |
| Fluoroquinolone | 281   | Ciprofloxacin 250mg tablets   |
| Fluoroquinolone | 52945 | Ciprofloxacin 200mg/100ml solution for infusion vials   |
| Fluoroquinolone | 583   | Ciprofloxacin 500mg tablets   |
| Fluoroquinolone | 34523 | Ofloxacin 200mg tablets (Sandoz Ltd)  |
| Fluoroquinolone | 61783 | Ciprofloxacin 250mg tablets (Waymade Healthcare Plc)  |
| Fluoroquinolone | 21812 | Ciproxin 100mg/50ml solution for infusion bottles (Bayer Plc)   |
| Fluoroquinolone | 29507 | Ciprofloxacin 400mg/200ml in sodium chloride 0.9% infusion  |
| Fluoroquinolone | 30877 | Tarivid 2mg/ml Infusion (Aventis Pharma)  |
| Fluoroquinolone | 70756 | Ofloxacin 100mg/5ml oral solution   |
| Fluoroquinolone | 45285 | Ciprofloxacin 500mg tablets (Teva UK Ltd)   |
| Fluoroquinolone | 73645 | Ciprofloxacin 750mg tablets (Almus Pharmaceuticals Ltd)   |
| Fluoroquinolone | 38171 | Ciprofloxacin 200mg/100ml infusion bags   |

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| Fluoroquinolone | 54701 | Ciprofloxacin 250mg tablets (Bristol Laboratories Ltd)   |
| Fluoroquinolone | 72157 | Levofloxacin 250mg tablets (DE Pharmaceuticals)  |
| Fluoroquinolone | 34448 | Ciprofloxacin 250mg tablets (Niche Generics Ltd)   |
| Fluoroquinolone | 34541 | Ofloxacin 200mg tablets (Teva UK Ltd)  |
| Fluoroquinolone | 6295  | Levofloxacin 250mg tablets   |
| Fluoroquinolone | 61302 | Ciprofloxacin 100mg tablets (Almus Pharmaceuticals Ltd)  |
| Fluoroquinolone | 6306  | Moxifloxacin 400mg tablets   |
| Fluoroquinolone | 53088 | Ciprofloxacin 500mg tablets (Dr Reddy's Laboratories (UK) Ltd)   |
| Fluoroquinolone | 58345 | Levofloxacin 250mg tablets (Mylan)   |
| Fluoroquinolone | 79522 | Norfloxacin 400mg tablets (A A H Pharmaceuticals Ltd)  |
| Fluoroquinolone | 43814 | Ciprofloxacin 250mg tablets (Dr Reddy's Laboratories (UK) Ltd)   |
| Fluoroquinolone | 53878 | Ciprofloxacin 500mg tablets (Ranbaxy (UK) Ltd)   |
| Fluoroquinolone | 81778 | Ciprofloxacin 100mg tablets (Nexcape Pharmaceuticals Ltd)  |
| Fluoroquinolone | 52807 | Ciproxin 500mg tablets (Mawdsley-Brooks & Company Ltd)   |
| Fluoroquinolone | 29280 | Ofloxacin 2mg/ml Infusion  |
| Fluoroquinolone | 79808 | Ciprofloxacin 750mg tablets (DE Pharmaceuticals)   |
| Fluoroquinolone | 27016 | CIPROFLOXACIN  |
| Fluoroquinolone | 58235 | Ciprofloxacin 250mg tablets (DE Pharmaceuticals)   |
| Fluoroquinolone | 59572 | Ciprofloxacin 500mg tablets (Sigma Pharmaceuticals Plc)  |
| Fluoroquinolone | 26840 | Ciprofloxacin 100mg/50ml solution for infusion bottles   |
| Fluoroquinolone | 34559 | Ciprofloxacin 250mg tablets (Sandoz Ltd)   |
| Fluoroquinolone | 45341 | Ciprofloxacin 500mg Tablet (Neo Laboratories Ltd)  |
| Fluoroquinolone | 41561 | Ciprofloxacin 250mg tablets (IVAX Pharmaceuticals UK Ltd)  |
| Fluoroquinolone | 81149 | Ciproxin 500mg tablets (Lexon (UK) Ltd)  |
| Fluoroquinolone | 34819 | Ofloxacin 400mg tablets (Mylan)  |
| Fluoroquinolone | 30707 | Ciprofloxacin 500mg tablets (Mylan)  |
| Fluoroquinolone | 78359 | Ciprofloxacin 250mg tablets (Sigma Pharmaceuticals Plc)<br>Ciprofloxacin 400mg/200ml solution for infusion vials (A A H Pharmaceuticals Ltd) |
| Fluoroquinolone | 66971 | Ltd)   |
| Fluoroquinolone | 58021 | Ciprofloxacin 100mg tablets (Dr Reddy's Laboratories (UK) Ltd)   |
| Fluoroquinolone | 54302 | Ciprofloxacin 250mg tablets (Medreich Plc)   |
| Fluoroquinolone | 58323 | Ciprofloxacin 100mg tablets (Alliance Healthcare (Distribution) Ltd)   |
| Fluoroquinolone | 64446 | Ciprofloxacin 250mg tablets (Tillomed Laboratories Ltd)  |
| Fluoroquinolone | 38006 | Ciproxin 400mg/200ml Infusion (Bayer Plc)  |
| Fluoroquinolone | 29343 | Ciprofloxacin 250mg tablets (A A H Pharmaceuticals Ltd)  |
| Fluoroquinolone | 43123 | Moxifloxacin 400mg/250ml solution for infusion bottles   |
| Fluoroquinolone | 82236 | Ofloxacin 200mg tablets (Mylan)  |
| Fluoroquinolone | 57118 | Ciprofloxacin 250mg tablets (Kent Pharmaceuticals Ltd)   |
| Fluoroquinolone | 65885 | Levofloxacin 500mg tablets (Waymade Healthcare Plc)  |
| Fluoroquinolone | 1837  | Ciprofloxacin 750mg tablets  |
| Fluoroquinolone | 79853 | Ciprofloxacin 500mg tablets (Noumed Life Sciences Ltd)   |
| Fluoroquinolone | 52501 | Ciprofloxacin 500mg tablets (Accord Healthcare Ltd)  |
| Fluoroquinolone | 34322 | Ciprofloxacin 500mg Tablet (Niche Generics Ltd)  |
| Fluoroquinolone | 53641 | Ciprofloxacin 500mg tablets (Strides Pharma UK Ltd)  |
| Fluoroquinolone | 32112 | Norfloxacin 400mg tablets (Genus Pharmaceuticals Ltd)  |

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| Fluoroquinolone | 29472 | Ciprofloxacin 750mg tablets (A A H Pharmaceuticals Ltd)   |
| Fluoroquinolone | 71011 | Ciprofloxacin 250mg tablets (APC Pharmaceuticals & Chemicals (Europe) Ltd)  |
| Fluoroquinolone | 47785 | Ciprofloxacin 400mg/200ml infusion bags   |
| Fluoroquinolone | 67572 | Levofloxacin 250mg tablets (Accord Healthcare Ltd)  |
| Fluoroquinolone | 66727 | Ciprofloxacin 500mg/5ml oral suspension   |
| Fluoroquinolone | 52177 | Ciproxin 500mg tablets (Sigma Pharmaceuticals Plc)  |
| Fluoroquinolone | 6206  | Tavanic 500mg tablets (Sanofi)  |
| Fluoroquinolone | 4513  | Tarivid 200mg tablets (Sanofi)  |
| Fluoroquinolone | 55708 | Levofloxacin 250mg tablets (Actavis UK Ltd)   |
| Fluoroquinolone | 66317 | Tarivid 200mg/100ml solution for infusion bottles (Sanofi)  |
| Fluoroquinolone | 43797 | Ciprofloxacin 500mg tablets (Sandoz Ltd)  |
| Fluoroquinolone | 49445 | Ciprofloxacin 500mg tablets (Almus Pharmaceuticals Ltd)   |
| Fluoroquinolone | 52099 | Ciprofloxacin 750mg tablets (Bristol Laboratories Ltd)  |
| Fluoroquinolone | 61850 | Levofloxacin 500mg tablets (A A H Pharmaceuticals Ltd)  |
| Fluoroquinolone | 52353 | Ciproxin 250mg tablets (DE Pharmaceuticals)   |
| Fluoroquinolone | 51537 | Ciprofloxacin 250mg tablets (Alliance Healthcare (Distribution) Ltd)  |
| Fluoroquinolone | 66483 | Ciprofloxacin 170mg/5ml oral suspension   |
| Fluoroquinolone | 54993 | Ciprofloxacin 400mg/200ml solution for infusion vials   |
| Fluoroquinolone | 34391 | Ofloxacin 400mg tablets (Sandoz Ltd)  |
| Fluoroquinolone | 2253  | Utinor 400mg tablets (Merck Sharp & Dohme Ltd)  |
| Fluoroquinolone | 58246 | Ciprofloxacin 400mg/200ml infusion bags (Pfizer Ltd)  |
| Fluoroquinolone | 34605 | Ciprofloxacin 500mg tablets (Actavis UK Ltd)  |
| Fluoroquinolone | 77918 | Levofloxacin 500mg tablets (Teva UK Ltd)  |
| Fluoroquinolone | 498   | Ciprofloxacin 100mg tablets   |
| Fluoroquinolone | 68274 | Ciproxin 500mg tablets (DE Pharmaceuticals)   |
| Fluoroquinolone | 64301 | Ciprofloxacin 500mg tablets (Kent Pharmaceuticals Ltd)  |
| Fluoroquinolone | 50601 | Ciprofloxacin 250mg tablets (Accord Healthcare Ltd)   |
| Fluoroquinolone | 34694 | Ciprofloxacin 250mg tablets (PLIVA Pharma Ltd)  |
| Fluoroquinolone | 45263 | Ofloxacin 400mg tablets (A A H Pharmaceuticals Ltd)   |
| Fluoroquinolone | 33989 | Ciprofloxacin 250mg tablets (Mylan)   |
| Fluoroquinolone | 73431 | Levofloxacin 500mg tablets (DE Pharmaceuticals)   |
| Fluoroquinolone | 76430 | Ciprofloxacin 750mg tablets (APC Pharmaceuticals & Chemicals (Europe) Ltd)  |
| Fluoroquinolone | 66214 | Ciprofloxacin 250mg tablets (Ranbaxy (UK) Ltd)  |
| Fluoroquinolone | 163   | Ciproxin 250mg/5ml oral suspension (Bayer Plc)<br>Ciprofloxacin 400mg/200ml solution for infusion vials (Genus Pharmaceuticals Ltd) |
| Fluoroquinolone | 64814 | Ltd)  |
| Fluoroquinolone | 61869 | Ciproxin 250mg/5ml oral suspension (Waymade Healthcare Plc)   |
| Fluoroquinolone | 58074 | Ciprofloxacin 400mg/200ml solution for infusion bottles   |
| Fluoroquinolone | 10319 | Levofloxacin 500mg/100ml Intravenous infusion   |
| Fluoroquinolone | 561   | Ofloxacin 200mg tablets   |
| Fluoroquinolone | 7519  | Norfloxacin 400mg tablets   |
| Fluoroquinolone | 56381 | Ciprofloxacin 250mg tablets (Strides Pharma UK Ltd)   |
| Fluoroquinolone | 50055 | Ciprofloxacin 500mg tablets (DE Pharmaceuticals)  |
| Fluoroquinolone | 73301 | Ciprofloxacin 250mg tablets (Phoenix Healthcare Distribution Ltd)   |
| Fluoroquinolone | 63501 | Ciprofloxacin 750mg tablets (Medreich Plc)  |



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| Fluoroquinolone | 34655 | Ciprofloxacin 250mg tablets (Wockhardt UK Ltd)                                      |
| Fluoroquinolone | 34973 | Ciprofloxacin 750mg Tablet (Niche Generics Ltd)                                     |
| Fluoroquinolone | 11883 | Ciprofloxacin 100mg/50ml solution for infusion vials                                |
| Fluoroquinolone | 42174 | Ciprofloxacin 500mg tablets (IVAX Pharmaceuticals UK Ltd)                           |
| Fluoroquinolone | 60817 | Levofloxacin 500mg tablets (Actavis UK Ltd)   |
| Fluoroquinolone | 33215 | Ciprofloxacin 200mg/100ml in sodium chloride 0.9% infusion                          |
| Fluoroquinolone | 43517 | Ciprofloxacin 750mg tablets (Actavis UK Ltd)  |
| Fluoroquinolone | 566   | Ofloxacin 400mg tablets   |
| Fluoroquinolone | 29458 | Ciprofloxacin 500mg tablets (A A H Pharmaceuticals Ltd)                             |
| Fluoroquinolone | 59653 | Ciproxin 400mg/200ml solution for infusion bottles (Bayer Plc)                      |
| Fluoroquinolone | 78938 | Levofloxacin 500mg tablets (Alliance Healthcare (Distribution) Ltd)                 |
| Fluoroquinolone | 77778 | Ciprofloxacin 150mg/5ml oral suspension   |
| Fluoroquinolone | 52616 | Ciprofloxacin 500mg tablets (Arrow Generics Ltd)                                    |
| Fluoroquinolone | 1202  | Ciproxin 250mg tablets (Bayer Plc)  |
| Fluoroquinolone | 24373 | Tavanic 500mg/100ml solution for infusion vials (Sanofi)                            |
| Fluoroquinolone | 34478 | Ciprofloxacin 250mg tablets (Teva UK Ltd)   |
| Fluoroquinolone | 72884 | Ciprofloxacin 500mg tablets (Alliance Healthcare (Distribution) Ltd)                |
| Fluoroquinolone | 32388 | Ciproxin 200mg/100ml Infusion (Bayer Plc)   |
| Fluoroquinolone | 728   | Ciproxin 500mg tablets (Bayer Plc)  |
| Fluoroquinolone | 34647 | Ciprofloxacin 250mg Tablet (Neo Laboratories Ltd)                                   |
| Fluoroquinolone | 56439 | Ciprofloxacin 200mg/100ml solution for infusion vials (A A H Pharmaceuticals Ltd)   |
| Fluoroquinolone | 25127 | Avelox 400mg tablets (Bayer Plc)  |
| Fluoroquinolone | 73933 | Ciprofloxacin 400mg/200ml solution for infusion vials (Intrapharm Laboratories Ltd) |
| Fluoroquinolone | 56012 | Levofloxacin 250mg tablets (Dr Reddy's Laboratories (UK) Ltd)                       |
| Fluoroquinolone | 80181 | Moxifloxacin 400mg tablets (Alliance Healthcare (Distribution) Ltd)                 |
| Fluoroquinolone | 75275 | Ciprofloxacin 400mg/200ml infusion bags (Bowmed Ibisqus Ltd)                        |
| Fluoroquinolone | 58955 | Ciprofloxacin 100mg/50ml solution for infusion vials (A A H Pharmaceuticals Ltd)    |
| Fluoroquinolone | 53673 | Levofloxacin 500mg/100ml infusion bags  |
| Fluoroquinolone | 81767 | Ofloxacin 200mg tablets (Sigma Pharmaceuticals Plc)                                 |
| Fluoroquinolone | 71572 | Ciprofloxacin 200mg/100ml solution for infusion bottles (Kent Pharmaceuticals Ltd)  |
| Fluoroquinolone | 73335 | Levofloxacin 250mg tablets (Teva UK Ltd)  |
| Fluoroquinolone | 73388 | Ciprofloxacin 400mg/200ml infusion bags (A A H Pharmaceuticals Ltd)                 |
| Fluoroquinolone | 68409 | Ciprofloxacin 750mg tablets (Phoenix Healthcare Distribution Ltd)                   |
| Fluoroquinolone | 65896 | Ciproxin 250mg tablets (Waymade Healthcare Plc)                                     |
| Fluoroquinolone | 74658 | Ciprofloxacin 750mg tablets (Sandoz Ltd)  |
| Fluoroquinolone | 42507 | Ciprofloxacin 100mg tablets (A A H Pharmaceuticals Ltd)                             |
| Fluoroquinolone | 80642 | Levofloxacin 250mg tablets (Alliance Healthcare (Distribution) Ltd)                 |
| Fluoroquinolone | 60436 | Ciprofloxacin 250mg tablets (Almus Pharmaceuticals Ltd)                             |
| Fluoroquinolone | 82147 | Ciprofloxacin 500mg tablets (Medihealth (Northern) Ltd)                             |
| Metronidazole   | 56049 | Metronidazole 200mg/5ml oral suspension (Alliance Healthcare (Distribution) Ltd)    |
| Metronidazole   | 58219 | Metronidazole 400mg tablets (Phoenix Healthcare Distribution Ltd)                   |
| Metronidazole   | 49531 | Metronidazole 200mg tablets (Milpharm Ltd)  |
| Metronidazole   | 24696 | Vaginyl 200mg Tablet (DDSA Pharmaceuticals Ltd)                                     |

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| Metronidazole | 61832 | Metronidazole 200mg/5ml oral suspension (Waymade Healthcare Plc)  |
| Metronidazole | 80272 | Metronidazole 500mg tablets (Zentiva)   |
| Metronidazole | 1681  | METRONIDAZOLE 200 MG MIX  |
| Metronidazole | 8781  | METRONIDAZOLE TAB/NYSTATIN PES COMBIPACK  |
| Metronidazole | 78582 | Metronidazole 10% ointment  |
| Metronidazole | 7106  | Flagyl 1g suppositories (Sanofi)<br>Metronidazole 500mg/100ml infusion 100ml Macoflex bags (Maco Pharma (UK) Ltd) |
| Metronidazole | 56448 | Ltd)  |
| Metronidazole | 34405 | Metronidazole 400mg tablets (IVAX Pharmaceuticals UK Ltd)   |
| Metronidazole | 67218 | Metronidazole 400mg tablets (Sigma Pharmaceuticals Plc)   |
| Metronidazole | 46188 | Flagyl minibag plus 500mg/100ml Infusion (Baxter Healthcare Ltd)  |
| Metronidazole | 53959 | Metronidazole 200mg tablets (Phoenix Healthcare Distribution Ltd)   |
| Metronidazole | 61434 | Metronidazole 400mg tablets (DE Pharmaceuticals)  |
| Metronidazole | 80130 | Metronidazole 500mg/100ml solution for infusion bottles   |
| Metronidazole | 21059 | METRONIDAZOLE .9 % SOL  |
| Metronidazole | 33896 | Metronidazole 400mg tablets (Teva UK Ltd)   |
| Metronidazole | 50808 | Metronidazole 200mg tablets (Alliance Healthcare (Distribution) Ltd)  |
| Metronidazole | 29336 | Metronidazole 200mg/5ml oral suspension (Rosemont Pharmaceuticals Ltd)  |
| Metronidazole | 47990 | Metronidazole 400mg tablets (Almus Pharmaceuticals Ltd)   |
| Metronidazole | 45260 | Metronidazole 200mg tablets (A A H Pharmaceuticals Ltd)   |
| Metronidazole | 67676 | Metronidazole 500mg/5ml oral suspension   |
| Metronidazole | 7564  | FLAGYL LOT  |
| Metronidazole | 34306 | Metronidazole 400mg tablets (Mylan)   |
| Metronidazole | 29327 | Metronidazole 400mg tablets (Actavis UK Ltd)  |
| Metronidazole | 28452 | Metrozol 500mg/100ml Infusion (Parkfields)  |
| Metronidazole | 28245 | Elyzol 1g Suppository (C P Pharmaceuticals Ltd)   |
| Metronidazole | 15375 | Metronidazole 500mg/100ml infusion 100ml bags   |
| Metronidazole | 31531 | Metronidazole 200mg/5ml oral suspension (A A H Pharmaceuticals Ltd)   |
| Metronidazole | 32068 | Metronidazole 200mg tablets (Teva UK Ltd)   |
| Metronidazole | 21060 | Metrolyl 200mg Tablet (Sandoz Ltd)  |
| Metronidazole | 15372 | Flagyl 500mg/100ml infusion 100ml bags (Baxter Healthcare Ltd)  |
| Metronidazole | 16179 | Metronidazole 5mg/ml Infusion   |
| Metronidazole | 78326 | Metronidazole 200mg/5ml oral suspension (Sigma Pharmaceuticals Plc)   |
| Metronidazole | 40090 | Metronidazole 400mg tablets (Sandoz Ltd)  |
| Metronidazole | 22420 | Metrolyl 500mg suppositories (Sandoz Ltd)   |
| Metronidazole | 62878 | Metronidazole 200mg tablets (DE Pharmaceuticals)  |
| Metronidazole | 36757 | Metronidazole 200mg tablets (Mylan)   |
| Metronidazole | 15185 | Metronidazole 400mg tablets and Nystatin 100,000unit pessaries  |
| Metronidazole | 26834 | METRONIDAZOLE   |
| Metronidazole | 51910 | Metronidazole 200mg tablets (Crescent Pharma Ltd)   |
| Metronidazole | 80217 | Metronidazole 500mg tablets (DE Pharmaceuticals)  |
| Metronidazole | 12199 | METRONIDAZOLE POW   |
| Metronidazole | 59056 | Metronidazole 200mg tablets (Sigma Pharmaceuticals Plc)   |
| Metronidazole | 15216 | Metrolyl 1g suppositories (Sandoz Ltd)  |
| Metronidazole | 46933 | Metronidazole 1g Suppository (Sandoz Ltd)   |

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| Metronidazole | 27210 | Metronidazole 100mg/20ml solution for infusion ampoules  |
| Metronidazole | 5836  | Metronidazole 1g suppositories   |
| Metronidazole | 34596 | Metronidazole 200mg tablets (IVAX Pharmaceuticals UK Ltd)  |
| Metronidazole | 50234 | Metronidazole 100mg/5ml oral suspension  |
| Metronidazole | 4465  | Metrolyl 400mg Tablet (Sandoz Ltd)   |
| Metronidazole | 27584 | METRONIDAZOLE  |
| Metronidazole | 3499  | Flagyl 400mg tablets (Sanofi)  |
| Metronidazole | 30089 | Norzol 200mg/5ml oral suspension (Rosemont Pharmaceuticals Ltd)  |
| Metronidazole | 52636 | Metronidazole 200mg tablets (Kent Pharmaceuticals Ltd)   |
| Metronidazole | 61034 | Metronidazole 500mg tablets (Sigma Pharmaceuticals Plc)  |
| Metronidazole | 431   | Metronidazole 400mg tablets  |
| Metronidazole | 75734 | Metronidazole 200mg suppositories  |
| Metronidazole | 15575 | METRONIDAZOLE .5 % LOT   |
| Metronidazole | 63589 | Metronidazole 500mg/100ml infusion 100ml bags (A A H Pharmaceuticals Ltd)<br>Metronidazole 500mg/100ml solution for infusion bottles (Peckforton<br>Pharmaceuticals Ltd) |
| Metronidazole | 72801 | Pharmaceuticals Ltd)   |
| Metronidazole | 57159 | Metronidazole 200mg/5ml oral suspension (Zentiva)  |
| Metronidazole | 52481 | Metronidazole 400mg tablets (Kent Pharmaceuticals Ltd)   |
| Metronidazole | 41692 | Metronidazole 200mg tablets (Actavis UK Ltd)<br>Clarithromycin 500mg with metronidazole 400mg with lansoprazole 30mg triple<br>pack                                      |
| Metronidazole | 6497  | pack   |
| Metronidazole | 305   | Metronidazole 200mg tablets  |
| Metronidazole | 76909 | Metronidazole 200mg/5ml oral suspension (Dawa Ltd)   |
| Metronidazole | 65099 | Metronidazole 50mg/5ml oral solution   |
| Metronidazole | 59724 | Metronidazole 500mg tablets (Alliance Healthcare (Distribution) Ltd)   |
| Metronidazole | 4933  | Metronidazole 200mg/5ml oral suspension  |
| Metronidazole | 5461  | Metronidazole 500mg suppositories  |
| Metronidazole | 406   | Metronidazole Treatment pack   |
| Metronidazole | 449   | Flagyl 200mg tablets (Sanofi)  |
| Metronidazole | 22246 | Metronidazole 500mg tablets (Accord Healthcare Ltd)  |
| Metronidazole | 66324 | Metronidazole Oral solution  |
| Metronidazole | 76849 | Metronidazole 200mg/5ml oral suspension (DE Pharmaceuticals)   |
| Metronidazole | 17240 | Flagyl 500mg suppositories (Sanofi)  |
| Metronidazole | 3702  | Flagyl-S 200mg/5ml oral suspension (Zentiva)   |
| Metronidazole | 38544 | Metronidazole 200mg tablets (Sandoz Ltd)   |
| Metronidazole | 55666 | Metronidazole 400mg tablets (Alliance Healthcare (Distribution) Ltd)   |
| Metronidazole | 19205 | Metronidazole 400mg tablets (A A H Pharmaceuticals Ltd)  |
| Metronidazole | 29590 | Zadstat 500mg Suppository (Wyeth Pharmaceuticals)  |
| Metronidazole | 57554 | Metronidazole 100mg/5ml oral solution  |
| Metronidazole | 151   | Flagyl 5mg/ml Infusion (Aventis Pharma)  |
| Metronidazole | 67979 | Metronidazole 200mg tablets (Mawdsley-Brooks & Company Ltd)  |
| Metronidazole | 41669 | Metronidazole 1g Suppository (C P Pharmaceuticals Ltd)   |
| Metronidazole | 54262 | Metronidazole 400mg tablets (Crescent Pharma Ltd)  |
| Metronidazole | 21478 | Nystatin with metronidazole 100,000iu with 400mg vaginal insert and tablet   |
| Metronidazole | 1311  | Metronidazole 500mg tablets  |
| Metronidazole | 63765 | Metronidazole 200mg/5ml oral solution  |

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| Metronidazole  | 40994 | Metronidazole 200mg tablets (Almus Pharmaceuticals Ltd)                                     |
| Metronidazole  | 75009 | Metronidazole 200mg Tablet (Regent Laboratories Ltd)  |
| Metronidazole  | 59906 | Metronidazole 400mg tablets (Waymade Healthcare Plc)  |
| Metronidazole  | 57216 | Metronidazole 400mg tablets (Milpharm Ltd)  |
| Metronidazole  | 394   | Flagyl Compak (Hawgreen Ltd)  |
| Metronidazole  | 61619 | Metronidazole 200mg tablets (Waymade Healthcare Plc)  |
| Metronidazole  | 29183 | Cefuroxime 750mg with metronidazole 500mg infusion  |
| Metronidazole  | 65015 | Metronidazole powder  |
| Nitrofurantoin | 75257 | Nitrofurantoin 1mg/5ml oral solution  |
| Nitrofurantoin | 53638 | Nitrofurantoin 100mg tablets (Teva UK Ltd)  |
| Nitrofurantoin | 58469 | Nitrofurantoin 5mg/5ml oral solution  |
| Nitrofurantoin | 68651 | Nitrofurantoin 30mg/5ml oral suspension   |
| Nitrofurantoin | 79415 | Nitrofurantoin 5.5mg/5ml oral suspension  |
| Nitrofurantoin | 51726 | Nitrofurantoin 40mg/5ml oral suspension   |
| Nitrofurantoin | 60252 | Nitrofurantoin 50mg capsules (Advanz Pharma)  |
| Nitrofurantoin | 1825  | Macrochantin 50mg capsules (Advanz Pharma)  |
| Nitrofurantoin | 81869 | Nitrofurantoin 20mg/5ml oral suspension   |
| Nitrofurantoin | 2023  | Furadantin 50mg tablets (Advanz Pharma)   |
| Nitrofurantoin | 66013 | Nitrofurantoin 50mg tablets (Almus Pharmaceuticals Ltd)                                     |
| Nitrofurantoin | 53659 | Nitrofurantoin 25mg/5ml oral suspension   |
| Nitrofurantoin | 62647 | Nitrofurantoin 50mg Tablet (Biorex Laboratories Ltd)  |
| Nitrofurantoin | 48353 | Nitrofurantoin 25mg/5ml oral suspension sugar free  |
| Nitrofurantoin | 73593 | Nitrofurantoin 10mg/5ml oral solution   |
| Nitrofurantoin | 79801 | Nitrofurantoin 100mg capsules (Actavis UK Ltd)  |
| Nitrofurantoin | 7495  | NITROFURANTOIN 25 MG TAB  |
| Nitrofurantoin | 79614 | Nitrofurantoin 18mg/5ml oral solution   |
| Nitrofurantoin | 64389 | Nitrofurantoin 30mg/5ml oral solution   |
| Nitrofurantoin | 7525  | Macrobid 100mg modified-release capsules (Advanz Pharma)                                    |
| Nitrofurantoin | 78391 | Nitrofurantoin 75mg/5ml oral suspension   |
| Nitrofurantoin | 65207 | Nitrofurantoin 24mg/5ml oral suspension   |
| Nitrofurantoin | 81484 | Nitrofurantoin 50mg capsules (Tillomed Laboratories Ltd)                                    |
| Nitrofurantoin | 75997 | Nitrofurantoin 50mg/5ml oral solution   |
| Nitrofurantoin | 75365 | Nitrofurantoin 12.5mg/5ml oral suspension   |
| Nitrofurantoin | 71845 | Nitrofurantoin 100mg/5ml oral suspension  |
| Nitrofurantoin | 69479 | Nitrofurantoin 25mg/5ml oral suspension sugar free (Alliance Healthcare (Distribution) Ltd) |
| Nitrofurantoin | 272   | Furadantin 25mg/5ml oral suspension (Mercury Pharma Group Ltd)                              |
| Nitrofurantoin | 54325 | Nitrofurantoin 50mg tablets (Phoenix Healthcare Distribution Ltd)                           |
| Nitrofurantoin | 35850 | Nitrofurantoin 100mg tablets (A A H Pharmaceuticals Ltd)                                    |
| Nitrofurantoin | 57779 | Nitrofurantoin 50mg tablets (Waymade Healthcare Plc)  |
| Nitrofurantoin | 75366 | Nitrofurantoin 10mg/5ml oral suspension   |
| Nitrofurantoin | 67759 | Nitrofurantoin 50mg tablets (Mylan)   |
| Nitrofurantoin | 79870 | Nitrofurantoin 50mg capsules (Morningside Healthcare Ltd)                                   |
| Nitrofurantoin | 6370  | Nitrofurantoin 100mg modified-release capsules  |
| Nitrofurantoin | 67981 | Genfura 100mg tablets (Genesis Pharmaceuticals Ltd)   |

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| Nitrofurantoin | 81437 | Macrobid 100mg modified-release capsules (CST Pharma Ltd)              |
| Nitrofurantoin | 76427 | Nitrofurantoin 100mg tablets (Genesis Pharmaceuticals Ltd)             |
| Nitrofurantoin | 60795 | Nitrofurantoin 35mg/5ml oral solution                                  |
| Nitrofurantoin | 76738 | Nitrofurantoin 100mg capsules (Morningside Healthcare Ltd)             |
| Nitrofurantoin | 82098 | Nitrofurantoin 50mg tablets (Sigma Pharmaceuticals Plc)                |
| Nitrofurantoin | 778   | Nitrofurantoin 50mg tablets  |
| Nitrofurantoin | 70380 | Nitrofurantoin 100mg tablets (Mawdsley-Brooks & Company Ltd)           |
| Nitrofurantoin | 53094 | Nitrofurantoin 50mg tablets (A A H Pharmaceuticals Ltd)                |
| Nitrofurantoin | 20527 | FURADANTIN 50 MG SUS   |
| Nitrofurantoin | 65803 | Macrobid 100mg modified-release capsules (Waymade Healthcare Plc)      |
| Nitrofurantoin | 53171 | Nitrofurantoin 50mg tablets (Dr Reddy's Laboratories (UK) Ltd)         |
| Nitrofurantoin | 79857 | Nitrofurantoin 14mg/5ml oral solution                                  |
| Nitrofurantoin | 79598 | Nitrofurantoin 50mg capsules (Actavis UK Ltd)                          |
| Nitrofurantoin | 78209 | Urantoïn 50mg tablets (Dr Reddy's Laboratories (UK) Ltd)               |
| Nitrofurantoin | 51959 | Nitrofurantoin 50mg tablets (Alliance Healthcare (Distribution) Ltd)   |
| Nitrofurantoin | 56621 | Nitrofurantoin 25mg/5ml oral solution                                  |
| Nitrofurantoin | 71315 | Nitrofurantoin 100mg tablets (Alliance Healthcare (Distribution) Ltd)  |
| Nitrofurantoin | 466   | Nitrofurantoin 100mg capsules  |
| Nitrofurantoin | 65251 | Macrochantin 50mg capsules (Waymade Healthcare Plc)                    |
| Nitrofurantoin | 57248 | Nitrofurantoin 5mg/5ml oral suspension                                 |
| Nitrofurantoin | 64690 | Nitrofurantoin 100mg/5ml oral solution                                 |
| Nitrofurantoin | 2887  | Nitrofurantoin 100mg tablets   |
| Nitrofurantoin | 2541  | Furadantin 100mg tablets (Advanz Pharma)                               |
| Nitrofurantoin | 16284 | Urantoïn 100mg tablets (Dr Reddy's Laboratories (UK) Ltd)              |
| Nitrofurantoin | 75209 | Nitrofurantoin 100mg tablets (Waymade Healthcare Plc)                  |
| Nitrofurantoin | 57669 | Nitrofurantoin 50mg tablets (Genesis Pharmaceuticals Ltd)              |
| Nitrofurantoin | 73590 | Nitrofurantoin 50mg/5ml oral suspension                                |
| Nitrofurantoin | 41397 | Nitrofurantoin 100mg tablets (Actavis UK Ltd)                          |
| Nitrofurantoin | 70796 | Nitrofurantoin 50mg tablets (Teva UK Ltd)                              |
| Nitrofurantoin | 210   | Nitrofurantoin 50mg capsules   |
| Nitrofurantoin | 40164 | Nitrofurantoin 50mg tablets (Actavis UK Ltd)                           |
| Nitrofurantoin | 69434 | Genfura 50mg tablets (Genesis Pharmaceuticals Ltd)                     |
| Nitrofurantoin | 59497 | Nitrofurantoin 7mg/5ml oral suspension                                 |
| Nitrofurantoin | 61907 | Nitrofurantoin 50mg capsules (Alliance Healthcare (Distribution) Ltd)  |
| Nitrofurantoin | 61642 | Nitrofurantoin 100mg capsules (Alliance Healthcare (Distribution) Ltd) |
| Nitrofurantoin | 2036  | Macrochantin 100mg capsules (Advanz Pharma)                            |
| Nitrofurantoin | 35673 | Nitrofurantoin 25mg/5ml oral suspension sugar free (Advanz Pharma)     |
| Nitrofurantoin | 67762 | Nitrofurantoin 100mg tablets (Mylan)                                   |
| Nitrofurantoin | 60713 | Nitrofurantoin 100mg capsules (Advanz Pharma)                          |
| Nitrofurantoin | 75133 | Nitrofurantoin 100mg capsules (A A H Pharmaceuticals Ltd)              |
| Nitrofurantoin | 79573 | Nitrofurantoin 100mg capsules (Tillomed Laboratories Ltd)              |
| Nitrofurantoin | 74369 | Nitrofurantoin 100mg tablets (Sigma Pharmaceuticals Plc)               |
| Nitrofurantoin | 25078 | NITROFURANTOIN   |
| Nitrofurantoin | 74317 | Nitrofurantoin 100mg tablets (Phoenix Healthcare Distribution Ltd)     |
| Nitrofurantoin | 67095 | Nitrofurantoin 9mg/5ml oral suspension                                 |

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| Nitrofurantoin | 63588 | Nitrofurantoin 50mg capsules (A A H Pharmaceuticals Ltd)                                  |
| Nitrofurantoin | 80629 | Nitrofurantoin 12mg/5ml oral solution   |
| Nitrofurantoin | 73557 | Nitrofurantoin 8mg/5ml oral solution  |
| Nitrofurantoin | 2198  | Nitrofurantoin 25mg/5ml Oral suspension   |
| Phenytoin      | 21854 | Pentran 100mg Tablet (Berk Pharmaceuticals Ltd)   |
| Phenytoin      | 62181 | Phenytoin sodium 100mg tablets (Kent Pharmaceuticals Ltd)                                 |
| Phenytoin      | 14857 | Phenytoin 50mg chewable tablets   |
| Phenytoin      | 4175  | Epanutin 30mg/5ml oral suspension (Upjohn UK Ltd)   |
| Phenytoin      | 59082 | Phenytoin sodium 100mg capsules (Alliance Healthcare (Distribution) Ltd)                  |
| Phenytoin      | 60245 | Phenytoin 90mg/5ml oral suspension (Drug Tariff Special Order)                            |
| Phenytoin      | 53750 | Phenytoin sodium 50mg capsules (A A H Pharmaceuticals Ltd)                                |
| Phenytoin      | 59378 | Phenytoin sodium 100mg tablets (Wockhardt UK Ltd)   |
| Phenytoin      | 12469 | Epanutin Ready-Mixed Parenteral 250mg/5ml solution for injection ampoules (Upjohn UK Ltd) |
| Phenytoin      | 5587  | Phenytoin sodium 50mg capsules  |
| Phenytoin      | 60573 | Phenytoin sodium 50mg capsules (Alliance Healthcare (Distribution) Ltd)                   |
| Phenytoin      | 54984 | Phenytoin 300mg/5ml oral solution   |
| Phenytoin      | 27881 | PHENYTOIN   |
| Phenytoin      | 3068  | Phenytoin 300mg capsule   |
| Phenytoin      | 19326 | PHENYTOIN 25 MG SYR   |
| Phenytoin      | 75764 | Phenytoin sodium oral solution  |
| Phenytoin      | 58539 | Phenytoin 90mg/5ml oral solution  |
| Phenytoin      | 27541 | PHENYTOIN   |
| Phenytoin      | 8452  | PHENYTOIN 150 MG SUS  |
| Phenytoin      | 59520 | PHENOBARBITONE 50MG & PHENYTOIN 100MG MG CAP  |
| Phenytoin      | 6504  | Phenytoin sodium 100mg capsules   |
| Phenytoin      | 7498  | Epanutin 25mg capsules (Pfizer Ltd)   |
| Phenytoin      | 6594  | Phenytoin sodium 300mg capsules   |
| Phenytoin      | 34592 | Phenytoin sodium 100mg tablets (A A H Pharmaceuticals Ltd)                                |
| Phenytoin      | 50148 | Phenytoin sodium 25mg capsules (Flynn Pharma Ltd)   |
| Phenytoin      | 4490  | Phenytoin 30mg/5ml oral suspension  |
| Phenytoin      | 59467 | Phenytoin sodium 25mg capsules (Alliance Healthcare (Distribution) Ltd)                   |
| Phenytoin      | 2782  | Phenytoin sodium 50mg tablets   |
| Phenytoin      | 50147 | Phenytoin sodium 100mg capsules (Flynn Pharma Ltd)  |
| Phenytoin      | 74082 | Phenytoin sodium 100mg capsules (DE Pharmaceuticals)                                      |
| Phenytoin      | 2128  | Phenytoin 50mg capsule  |
| Phenytoin      | 1398  | Epanutin 100mg capsules (Pfizer Ltd)  |
| Phenytoin      | 74244 | Phenytoin sodium 250mg/5ml solution for injection ampoules (Alliance Pharmaceuticals Ltd) |
| Phenytoin      | 22286 | PHENOBARBITONE 60MG & PHENYTOIN 100MG MG TAB  |
| Phenytoin      | 31634 | PHENYTOIN SODIUM/ PHENOBARBITONE SODIUM TAB   |
| Phenytoin      | 78445 | Phenytoin 50mg Tablet (Berk Pharmaceuticals Ltd)  |
| Phenytoin      | 76613 | Phenytoin sodium 84mg/5ml oral solution   |
| Phenytoin      | 59293 | Phenytoin sodium 300mg capsules (Alliance Healthcare (Distribution) Ltd)                  |
| Phenytoin      | 68286 | Phenytoin sodium 100mg tablets (Almus Pharmaceuticals Ltd)                                |
| Phenytoin      | 17177 | Epanutin Infatabs 50mg chewable tablets (Upjohn UK Ltd)                                   |

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| Phenytoin    | 67841 | Epanutin 50mg capsules (Waymade Healthcare Plc)                              |
| Phenytoin    | 77399 | Epanutin 100mg capsules (Dowelhurst Ltd)                                     |
| Phenytoin    | 47014 | Phenytoin 90mg/5ml oral suspension   |
| Phenytoin    | 75575 | Phenytoin 50mg Tablet (IVAX Pharmaceuticals UK Ltd)                          |
| Phenytoin    | 15106 | PHENYTOIN 30 MG TAB  |
| Phenytoin    | 7804  | PHENYTOIN SODIUM/ PHENOBARBITONE CAP   |
| Phenytoin    | 63271 | Phenytoin 300mg/5ml oral solution (Special Order)                            |
| Phenytoin    | 107   | Phenytoin 25mg capsule   |
| Phenytoin    | 66347 | Phenytoin sodium 100mg capsules (Sigma Pharmaceuticals Plc)                  |
| Phenytoin    | 53846 | Phenytoin sodium 300mg capsules (A A H Pharmaceuticals Ltd)                  |
| Phenytoin    | 9678  | Phenytoin 90mg/5ml oral solution sugar free                                  |
| Phenytoin    | 67150 | Phenytoin 300mg/5ml oral suspension (Special Order)                          |
| Phenytoin    | 24637 | Phenytoin sodium 250mg/5ml solution for injection ampoules                   |
| Phenytoin    | 3882  | EPANUTIN + PHENOBARB CAP   |
| Phenytoin    | 59504 | Phenytoin sodium 100mg tablets (Alliance Healthcare (Distribution) Ltd)      |
| Phenytoin    | 61769 | Phenytoin sodium 25mg capsules (A A H Pharmaceuticals Ltd)                   |
| Phenytoin    | 30392 | Pentran 50mg Tablet (Berk Pharmaceuticals Ltd)                               |
| Phenytoin    | 59377 | Phenytoin sodium 100mg capsules (Actavis UK Ltd)                             |
| Phenytoin    | 34699 | Phenytoin 90mg/5ml Oral suspension sugar free (Rosemont Pharmaceuticals Ltd) |
| Phenytoin    | 49789 | Phenytoin sodium 50mg capsules (Flynn Pharma Ltd)                            |
| Phenytoin    | 56786 | Phenytoin sodium 100mg tablets (Milpharm Ltd)                                |
| Phenytoin    | 6624  | Phenytoin sodium 25mg capsules   |
| Phenytoin    | 79129 | Dilantin Infatabs 50mg chewable tablets (Imported (Canada))                  |
| Phenytoin    | 22131 | PHENOBARBITONE & PHENYTOIN 60 MG CAP   |
| Phenytoin    | 47670 | Phenytoin 100mg Capsule (Actavis UK Ltd)                                     |
| Phenytoin    | 2062  | Phenytoin sodium 100mg tablets   |
| Phenytoin    | 1370  | Phenytoin 100mg capsule  |
| Phenytoin    | 21632 | EPANUTIN INFATABS  |
| Phenytoin    | 10263 | Epanutin 300mg capsules (Pfizer Ltd)   |
| Phenytoin    | 3881  | Epanutin 50mg capsules (Pfizer Ltd)  |
| Phenytoin    | 34144 | Phenytoin sodium 100mg tablets (Actavis UK Ltd)                              |
| Phenytoin    | 27113 | Phenytoin sodium 100mg tablets (Teva UK Ltd)                                 |
| Phenytoin    | 62650 | Phenytoin 100mg Tablet (Berk Pharmaceuticals Ltd)                            |
| Phenytoin    | 53749 | Phenytoin sodium 100mg capsules (A A H Pharmaceuticals Ltd)                  |
| Phenytoin    | 50159 | Phenytoin sodium 300mg capsules (Flynn Pharma Ltd)                           |
| Phenytoin    | 66608 | Phenytoin sodium 100mg tablets (Waymade Healthcare Plc)                      |
| Trimethoprim | 34633 | Trimethoprim 200mg tablets (Sandoz Ltd)                                      |
| Trimethoprim | 340   | Trimethoprim 100mg tablets   |
| Trimethoprim | 24324 | Trimogal 200mg Tablet (Lagap)  |
| Trimethoprim | 57080 | Trimethoprim 100mg tablets (Waymade Healthcare Plc)                          |
| Trimethoprim | 65487 | Trimethoprim 200mg tablets (DE Pharmaceuticals)                              |
| Trimethoprim | 21805 | Triprimix 200 Tablet (Ashbourne Pharmaceuticals Ltd)                         |
| Trimethoprim | 50797 | Trimethoprim 200mg tablets (Alliance Healthcare (Distribution) Ltd)          |
| Trimethoprim | 65497 | Trimethoprim 200mg tablets (Mawdsley-Brooks & Company Ltd)                   |

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| Trimethoprim | 67361 | Trimethoprim 50mg/5ml oral suspension sugar free (Phoenix Healthcare Distribution Ltd)   |
| Trimethoprim | 50120 | Trimethoprim 200mg tablets (Accord Healthcare Ltd)   |
| Trimethoprim | 34878 | Trimethoprim 100mg Tablet (C P Pharmaceuticals Ltd)  |
| Trimethoprim | 81426 | Trimogal 200mg tablets (Ennogen Pharma Ltd)  |
| Trimethoprim | 34542 | Trimethoprim 100mg tablets (Teva UK Ltd)   |
| Trimethoprim | 226   | TRIMETHOPRIM 100 MG CAP  |
| Trimethoprim | 53276 | Trimethoprim 50mg/5ml oral suspension sugar free (Kent Pharmaceuticals Ltd)  |
| Trimethoprim | 62630 | Trimethoprim 200mg tablets (Ranbaxy (UK) Ltd)  |
| Trimethoprim | 8171  | Monotrim 200mg tablets (Abbott Healthcare Products Ltd)  |
| Trimethoprim | 34252 | Trimethoprim 50mg/5ml oral suspension sugar free (A A H Pharmaceuticals Ltd)   |
| Trimethoprim | 32906 | Trimethoprim 100mg tablets (A A H Pharmaceuticals Ltd)   |
| Trimethoprim | 34392 | Trimethoprim 200mg tablets (Actavis UK Ltd)  |
| Trimethoprim | 53599 | Trimethoprim 200mg tablets (Phoenix Healthcare Distribution Ltd)   |
| Trimethoprim | 14367 | Ipral 50mg/5ml Liquid (E R Squibb and Sons Ltd)  |
| Trimethoprim | 81909 | Trimogal 100mg tablets (Ennogen Pharma Ltd)  |
| Trimethoprim | 41544 | Trimethoprim 100mg Tablet (IVAX Pharmaceuticals UK Ltd)  |
| Trimethoprim | 43545 | Trimethoprim 100mg tablets (Actavis UK Ltd)  |
| Trimethoprim | 75766 | Trimethoprim 100mg Tablet (Celltech Pharma Europe Ltd)   |
| Trimethoprim | 477   | Trimethoprim 50mg/5ml oral suspension sugar free<br>Monotrim 100mg/5ml solution for injection ampoules (Abbott Healthcare Products Ltd)                          |
| Trimethoprim | 13306 | Ltd)   |
| Trimethoprim | 51510 | Trimethoprim 200mg tablets (Bristol Laboratories Ltd)  |
| Trimethoprim | 58490 | Trimethoprim 100mg tablets (Alliance Healthcare (Distribution) Ltd)<br>Trimethoprim 50mg/5ml oral suspension sugar free (Alliance Healthcare (Distribution) Ltd) |
| Trimethoprim | 53275 | (Distribution) Ltd)  |
| Trimethoprim | 280   | Monotrim 50mg/5ml Liquid (Solvay Healthcare)   |
| Trimethoprim | 39933 | Trimethoprim 200mg tablets (Almus Pharmaceuticals Ltd)   |
| Trimethoprim | 15081 | Ipral 100mg Tablet (E R Squibb and Sons Ltd)   |
| Trimethoprim | 36622 | Monotrim 50mg/5ml oral suspension (Chemidex Pharma Ltd)  |
| Trimethoprim | 60808 | Trimethoprim 50mg/5ml oral suspension sugar free (Almus Pharmaceuticals Ltd)   |
| Trimethoprim | 34455 | Trimethoprim 200mg Tablet (C P Pharmaceuticals Ltd)  |
| Trimethoprim | 52669 | Trimethoprim 200mg/5ml oral solution   |
| Trimethoprim | 53793 | Trimethoprim 50mg/5ml oral suspension sugar free (Almus Pharmaceuticals Ltd)   |
| Trimethoprim | 27048 | Syraprim 300mg Tablet (Wellcome Medical Division)  |
| Trimethoprim | 34379 | Trimethoprim 200mg tablets (Kent Pharmaceuticals Ltd)  |
| Trimethoprim | 29532 | Trimogal 100mg Tablet (Lagap)  |
| Trimethoprim | 53828 | Trimethoprim 50mg/5ml oral suspension sugar free (Actavis UK Ltd)  |
| Trimethoprim | 61714 | Trimethoprim 50mg/5ml oral suspension sugar free (Pinewood Healthcare)   |
| Trimethoprim | 34488 | Trimethoprim 100mg tablets (Kent Pharmaceuticals Ltd)  |
| Trimethoprim | 8073  | Trimethoprim 300mg Tablet  |
| Trimethoprim | 21640 | Trimopan 100mg tablets (Teva UK Ltd)   |
| Trimethoprim | 53720 | Trimethoprim 100mg tablets (Almus Pharmaceuticals Ltd)   |
| Trimethoprim | 13325 | Monotrim 100mg tablets (Abbott Healthcare Products Ltd)  |
| Trimethoprim | 56267 | Trimethoprim 100mg tablets (Bristol Laboratories Ltd)  |
| Trimethoprim | 14998 | Ipral 200mg Tablet (E R Squibb and Sons Ltd)   |



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| Trimethoprim | 153   | Trimethoprim 100mg/5ml solution for injection ampoules                       |
| Trimethoprim | 45246 | Trimethoprim 100mg tablets (Sandoz Ltd)                                      |
| Trimethoprim | 49592 | Trimethoprim 100mg tablets (Phoenix Healthcare Distribution Ltd)             |
| Trimethoprim | 57116 | Trimethoprim 50mg/5ml oral suspension sugar free (Waymade Healthcare Plc)    |
| Trimethoprim | 57981 | Trimethoprim 200mg tablets (Waymade Healthcare Plc)                          |
| Trimethoprim | 75085 | Trimethoprim 240mg/5ml oral solution   |
| Trimethoprim | 10046 | Trimopan 200mg tablets (Teva UK Ltd)   |
| Trimethoprim | 27255 | Trimethoprim 200mg tablets (A A H Pharmaceuticals Ltd)                       |
| Trimethoprim | 57642 | Trimethoprim 20mg/5ml oral solution  |
| Trimethoprim | 51725 | Trimethoprim 20mg/5ml oral suspension  |
| Trimethoprim | 53284 | Trimethoprim 50mg/5ml oral suspension sugar free (Sigma Pharmaceuticals Plc) |
| Trimethoprim | 22199 | IPRAL PAED   |
| Trimethoprim | 73626 | Trimethoprim 7mg/5ml oral solution   |
| Trimethoprim | 25497 | Syraprim 100mg Tablet (Wellcome Medical Division)                            |
| Trimethoprim | 33997 | Trimethoprim 200mg tablets (IVAX Pharmaceuticals UK Ltd)                     |
| Trimethoprim | 64028 | Trimethoprim 200mg tablets (Crescent Pharma Ltd)                             |
| Trimethoprim | 43505 | Trimethoprim 200mg Tablet (Numark Management Ltd)                            |
| Trimethoprim | 78888 | Trimethoprim 50mg/5ml oral suspension sugar free (DE Pharmaceuticals)        |
| Trimethoprim | 67147 | Trimethoprim 100mg tablets (Mawdsley-Brooks & Company Ltd)                   |
| Trimethoprim | 29351 | Trimethoprim 50mg/5ml oral suspension sugar free (Teva UK Ltd)               |
| Trimethoprim | 43537 | Trimethoprim 200mg Tablet (Celltech Pharma Europe Ltd)                       |
| Trimethoprim | 31227 | Trimethoprim 200mg Tablet (Regent Laboratories Ltd)                          |
| Trimethoprim | 7616  | Trimopan 50mg/5ml Liquid (Berk Pharmaceuticals Ltd)                          |
| Trimethoprim | 67596 | Trimethoprim 100mg tablets (DE Pharmaceuticals)                              |
| Trimethoprim | 68225 | Trimethoprim 100mg tablets (Crescent Pharma Ltd)                             |
| Trimethoprim | 32908 | Trimethoprim 200mg tablets (Teva UK Ltd)                                     |
| Trimethoprim | 37    | Trimethoprim 200mg tablets   |
| Trimethoprim | 56259 | Trimethoprim 100mg tablets (Sigma Pharmaceuticals Plc)                       |
| Trimethoprim | 55986 | Trimethoprim 200mg/5ml oral suspension                                       |
| Trimethoprim | 78999 | Trimethoprim Oral solution   |

**ICD-10 code lists**

| <b>Condition</b>   | <b>ICD-10 code</b> | <b>Description</b>   |
|--------------------|--------------------|--|
| Retinal Detachment | H33.0              | Retinal detachment with retinal break  |
| Retinal Detachment | H33.5              | Other retinal detachments  |
| Retinal Detachment | H33.2              | Serous retinal detachment  |
| Retinal Detachment | H33.4              | Traction detachment of retina  |
| Uveitis            | H32.0              | Chorioretinal inflammation in infectious and parasitic diseases classified elsewhere |
| Uveitis            | H20.2              | Lens-induced iridocyclitis   |
| Uveitis            | H30                | Chorioretinal inflammation   |
| Uveitis            | H22                | Disorders of iris and ciliary body in diseases classified elsewhere                  |
| Uveitis            | H32                | Chorioretinal disorders in diseases classified elsewhere                             |
| Uveitis            | H30.2              | Posterior cyclitis   |
| Uveitis            | H30.1              | Disseminated chorioretinal inflammation  |
| Uveitis            | H30.8              | Other chorioretinal inflammations  |
| Uveitis            | H20.9              | Unspecified iridocyclitis  |
| Uveitis            | H30.9              | Unspecified chorioretinal inflammation   |
| Uveitis            | H30.0              | Focal chorioretinal inflammation   |
| Uveitis            | H22.1              | Iridocyclitis in other diseases classified elsewhere                                 |
| Uveitis            | H20.0              | Acute and subacute iridocyclitis   |
| Uveitis            | H22.0              | Iridocyclitis in infectious and parasitic diseases classified elsewhere              |
| Uveitis            | H44.1              | Other endophthalmitis  |
| Uveitis            | H20.8              | Other iridocyclitis  |
| Uveitis            | H32.8              | Other chorioretinal disorders in diseases classified elsewhere                       |
| Uveitis            | H20                | Iridocyclitis  |