



# **High Technology Medicine in Practice: The Organisation of Work in Intensive Care**

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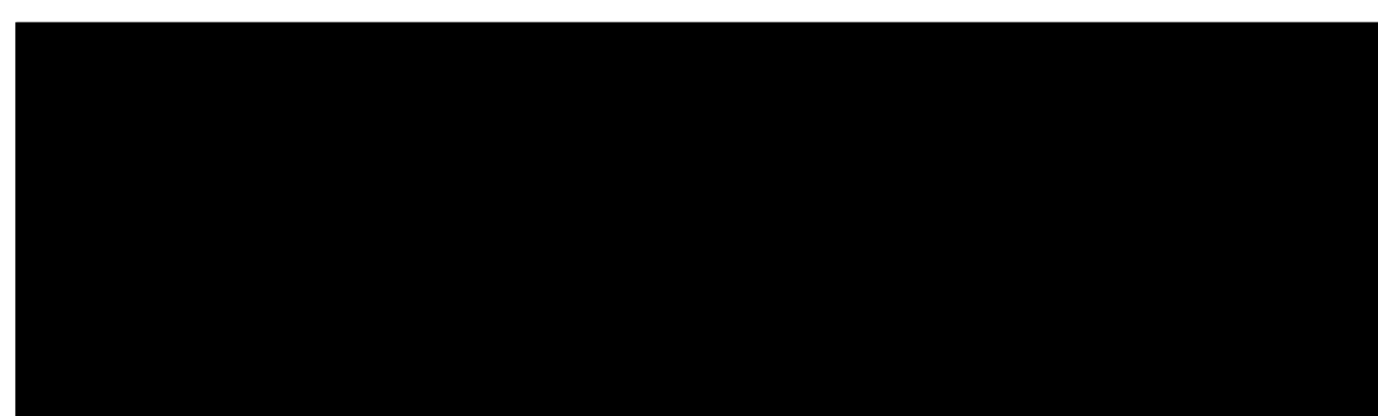
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## Declaration

I declare that the work presented in this thesis is my own.

Signed

A solid black rectangular box used to redact the signature of Simon H.M. Carmel.

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24th October 2003

## Abstract

The aim of this thesis is to develop a grounded understanding of the practice of high technology clinical work and how it is organised. It combines systematic empirical analysis of the clinical locale of intensive care with scholarly work in medical sociology and the related fields of health services research, medicine, nursing and social studies of science and technology. The empirical data were obtained through fieldwork on three intensive care units (ICUs). The methods comprised periods of detailed observation, informal conversational interviews in the field and tape-recorded semi-structured interviews.

The substantive contribution of the thesis is an analysis of contemporary and traditional themes in medical sociology: medical uncertainty; clinical knowledge in practice; inter-occupational relationships; the material and social character of medical and nursing work; and the organisational 'reality' of one clinical site within the modern hospital. In particular, the thesis demonstrates the utility of 'craft' as a metaphor for understanding medical work in ICU; provides a critical empirical review and reformulation of nursing theory as it has been applied to ICU; and proposes a new conception of the relationship between medicine and nursing in the grounded situation of clinical work.

Two subsidiary contributions are also made: one methodological and one theoretical. In terms of methodology, I provide concrete examples of how ethnographic analysis can explain findings which have been derived from other health services research methods and thereby inform the future direction of such research. In terms of theory, I illuminate current debates at the interface of medical sociology and social studies of science and technology about the appropriateness of a post-structural style of analysis. In conclusion, I specify in what ways our understanding of health care work is - and is not - enhanced by the adoption of Actor-Network Theory.

# Contents

	<i>Page</i>
<b>Abstract</b>	1
<b>Contents</b>	2
<b>Acknowledgements</b>	5
<b>Common Abbreviations</b>	6
<b>Chapter One. Introduction</b>	7
A thesis on intensive care	9
History and context for intensive care	15
HSR and organisational studies	21
Sociological study of organisations	28
Multi-disciplinary research	32
<b>Chapter Two. Review of Empirical Studies</b>	38
Evaluative studies of ICU organisation	39
Ethnographic studies of acute health care	57
Summary	65
<b>Chapter Three. Methodology</b>	67
The strengths of ethnography	68
Theoretical perspectives	70
Generalisation and sampling	77
Data collection and analysis	84
Gaining access	86
Presentation and management of self	93
Summary	96
<b>Chapter Four. A Day in the Life of ICU</b>	97
Initial impressions	98
Early morning	102
Day time	104
Night time	106
Differences between ICUs	109
Summary	111



	<i>Page</i>
<b>Chapter Five. Medical Uncertainty in ICU: the Contours of Clinical Knowledge</b>	<b>112</b>
Early observations of medical uncertainty in ICU	113
Sociological conceptions of medical uncertainty	115
Uncertainty in the knowledge base of medicine	123
Uncertainties in patient treatment	130
Implications of uncertainty: clinical knowledge	136
<b>Chapter Six. The ‘Craft’ of Medical Work in the ICU</b>	<b>139</b>
Evidence, judgement and science	140
Sociological conceptions of ‘craft’	146
Application of knowledge	153
Interaction with the material world	160
Summary: practical reasoning, practical skills	175
<b>Chapter Seven. Nursing Perspectives in Intensive Care</b>	<b>177</b>
Nursing’s contribution: ‘care’	178
Sociological conceptions of intensive care nursing	185
Intra-nursing communication	191
Points of dissonance and conflict between doctors and nurses	196
Similarities between medical and nursing work	202
Summary	207
<b>Chapter Eight. Controlling the Organisation</b>	<b>209</b>
Incorporating ICU nurses	210
Professional and organisational boundaries	218
Discussion	228
Summary	231
<b>Chapter Nine. Summary, Implications and Conclusion</b>	<b>232</b>
A sociological contribution to Health Services Research	232
Contribution to medical sociology	240
Alternative directions for sociological research on ICU	245
Conclusion: theorising the practice of high technology medicine	250

	<i>Page</i>
<b>Appendix One.</b> ‘Variation in intensive care unit outcomes: a search for the evidence on organizational factors’ (Carmel and Rowan, 2001)	253
<b>Appendix Two.</b> Research Protocol (for Local Research Ethics Committees)	267
<b>Appendix Three.</b> Information Sheet (for participants)	269
<b>References</b>	270

### **Tables**

<b>Table 3.1.</b> Sample of ICUs	82
<b>Table 3.2.</b> Occupations and grades	83
<b>Table 3.3.</b> In-depth interviews	84
<b>Table 6.1.</b> The hierarchy of evidence-in-practice in the ICU	156
<b>Table 7.1.</b> Comparison of medical and nursing work in ICU	208

### **Figure**

<b>Figure 6.1.</b> Haemofiltration machine and ECG trace interference	173
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<sup>1</sup>A footnote for the whole thesis: ‘I am grateful to Judy Green for many of these points’.



## Common Abbreviations

A&E	Accident and Emergency
ANT	Actor-Network Theory
BNF	British National Formulary
CMA	Case-mix adjusted / Case-mix adjustment
CMPD	Case Mix Programme Database (managed by ICNARC)
DGH	District General Hospital
DH	Department of Health (UK)
EBM	Evidence-based medicine
HDU	High Dependency Unit
HSR	Health Services Research
ICNARC	Intensive Care National Audit & Research Centre
ICS	Intensive Care Society
ICU	Intensive Care Unit
LREC	Local Research Ethics Committee
LSHTM	London School of Hygiene and Tropical Medicine
NHS	National Health Service (UK)
O and M	Organisation and management
RCT	Randomised, controlled trial
SHO	Senior House Officer (a grade of junior doctor)
SMR	Standardised Mortality Ratio
SpR	Specialist Registrar (an experienced junior doctor, in specialist training)
SSST	Social studies of science and technology
UK	United Kingdom
USA	United States of America



## Chapter One

### Introduction

Popular images of intensive care portray a dramatic yet serious environment, replete with life and death situations. The beginning of one episode of the popular police drama *The Bill*, for example, used the term ‘intensive care’ as a synonym for ‘very serious injury’, with an implication that a murder investigation might ensue:

Arrested suspect: “She’s having you on, I never touched her”.

Sergeant Gilmore: “Yeah, yeah, that’s why they put her in intensive care, I suppose they need to fill the beds.”

Other police and detective dramas often include a scene on an intensive care unit (ICU), where a lone nurse or doctor consoles a tearful relative from behind a screen (implying that the patient needs to be protected in a sterile room). The prevailing hushed atmosphere is interrupted only by intermittent beeping from high technology equipment.

Sergeant Gilmore’s sarcastic “I suppose they need to fill the beds” also conveys the sense of ICU as a hard-pressed service, where there is a continual pressure on resources. In this way ICU has also appeared in headline news, as in the “winter crisis” (Christmas and New Year period) of 1999-2000. A shortage of intensive care unit (ICU) beds in England was widely reported in the national press<sup>1</sup>: at one point, out of a total of 1400 ICU beds in England, only eleven were available for new patients<sup>2</sup>. Commentary and leader articles at the time commented on the lack of planning and funding for intensive care. The shortage of ICU beds was portrayed as symptomatic of under-funding of the British National Health Service (NHS) and emblematic of the difficulties faced by ‘front-line’ staff.

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<sup>1</sup>*The Daily Telegraph, The Independent, The Times, The Mirror, The Mail, The Express* (29 December 1999).

<sup>2</sup>*The Daily Telegraph* (6 January 2000).



In-depth media accounts have also used the ICU as emblematic for the NHS. ICU was the topic of the first episode of a five part television documentary about a large acute NHS Trust (*The Trust: Intensive Care* 2002). This programme highlighted staff shortages, falling nurse morale and the difficulties encountered by two senior staff (the Nurse Manager and a Consultant Anaesthetist) in ‘juggling’ patients and beds, and finding an adequate complement of nurses for subsequent shifts.

Fictional representations of ICUs seem to have influenced this documentary. The regular bleeps of medical technology were used as an audible marker of ICU, and the documentary’s background theme music was based on the sound of alarms, although such sounds could only be heard intermittently when recordings were made on the ICU itself. Likewise, the opening comments of the programme highlighted the life and death drama aspect of intensive care’s public profile:

If a critically ill patient is to have any chance of survival, they need a bed on intensive care. 90% are unconscious on arrival on the unit. Some remain in a coma for weeks. Some never wake up. (*The Trust: Intensive Care* 2002).

ICU connotes severely ill patients, complex, life-saving technology and the emotions and drama of life and death situations, as well as the general difficulties at the front line of health care work.

In regard to these connotations and representations, I should point out that through my ethnographic research on three ICUs I found the work was not usually dramatic. Emergency interventions, for example, usually occur before patients are admitted to the unit itself. Without disputing the specific ‘facts’ for the ICU featured in *The Trust: Intensive Care*, it is worth noting that the comments above cleverly move from ‘unconscious’, to ‘coma’, to ‘never waking up’, intensifying the sense of drama. (I would point out that national clinical audit data indicate that 80% of patients are sedated (*i.e.* ‘unconscious’) during their first 24 hours in ICU, while the proportion in a *coma* at admission is only 8%<sup>3</sup>). It is as patients are admitted to ICU that the noise of medical technology is most audible. Normally, ICUs are not hushed, as there is the general noise of discussions amongst the many staff and the ‘clatter’ of equipment being used.

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<sup>3</sup> Data from the Case Mix Programme Database (CMPD). The Case Mix Programme is the national, comparative audit of patient outcomes co-ordinated by the Intensive Care National Audit & Research Centre (ICNARC). CMPD data in this thesis are based on data for 204,333 admissions to 159 adult ICUs in based in NHS hospitals geographically spread across England, Wales and Northern Ireland. For more information on the representativeness and quality of these data, please contact ICNARC.



When alarms sound they are immediately responded to and usually switched off. The overall ambience is very different from, for example, a series of beeps in time with a heart rate. I would, though, in general terms, support the representation of ICUs as separated and cut-off from the rest of the hospital, a theme to which I return at various points in this thesis.

Following admission, which is the time when most visible activity and audible electromechanical noise is observed, most patients stay in ICU for up to two days, although some stay for much longer (the median length of stay in ICU is 1.8 days; the 90% reference range is 0.2 – 19.0 days<sup>4</sup>). Patients are admitted in situations of extreme physiological distress, for a wide range of diseases and conditions. The seriousness and life and death situation of intensive care is demonstrable: on average, one-quarter (24.8%) of admissions die in ICU, and one-third (33.1%) of all ICU admissions die at some point in their hospital stay<sup>5</sup>.

ICU is a well demarcated, often closed off and a sterile area in the modern acute hospital, with physical and organisational access closely guarded. The physical and organisational definition of ICU makes an analysis of the work and organisation of ICU feasible. That is the topic of this thesis.

### **A thesis on intensive care**

This thesis is an ethnographic analysis of the ICU as a particular site of high technology medicine. Its main contribution is to medical sociology. As I describe in this section, though, the research project originated within the field of health services research (HSR), and the thesis also makes a distinctively sociological contribution to HSR.

The original aim of this research was to identify ‘organisational factors’ which may impact on patient outcome following intensive care. From an HSR perspective this is a legitimate question since there are differences in patient outcome following intensive care: the rate of hospital mortality following intensive care ranges from 18.2% to

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<sup>4</sup> ICNARC Case Mix Programme Database.

<sup>5</sup> ICNARC Case Mix Programme Database.



55.4%<sup>6</sup>, and differences appear to remain significant even after adjustment for the case-mix of admissions (Rowan *et al.*, 1993). However, studies which have been undertaken in this area have been inconclusive. On the one hand, I felt troubled by an implied conflation of patient outcome, health care quality and organisational performance in these studies. (Although I accept that clinical effectiveness is the most important aspect of health care quality, its appropriate measurement is another matter entirely). On the other hand, it also gradually became clear that qualitative observation was a necessary (but not sufficient) component in linking organisational factors to patient outcome. Overall, in reviewing evaluative studies which fell into a broad category of ‘organisation of ICU’, I detected a rather simplistic approach to measuring ‘performance’. The field of HSR itself, while providing conceptual clarity with regard to measures of performance and health care quality, lacked a corpus of knowledge concerning micro-organisational phenomena – something which the discipline and traditions of medical sociology do provide.

As I discuss in chapter two, there are some observed differences in organisation which do seem to have an impact on patient outcome, although the evidence is largely equivocal. Even where the evidence is not equivocal, there remains the problem that the mechanisms causing differences are not understood, and indeed little systematic attempt seems to have been made to identify them. I discerned a need for research at a more fundamental level: my rationale for adopting a sociological approach became to provide one answer to the question ‘what is intensive care?’ rather than the question ‘how might intensive care be improved?’

One approach I considered was to locate the research in organisation theory/studies. But here I encountered another problem: the vastness of the theoretical literature on organisations and the large number of different disciplinary foci, including, for example, social psychology, management studies, sociology and economics; organisation studies therefore is undoubtedly a *social scientific* endeavour but lacks a single disciplinary perspective. I decided therefore to place the research within the context of medical sociology. There remained, though, two particular problems associated with restricting theoretical insights to sociology. The first was that more recent sociological literature has a focus on discursive practices and the identification of disciplinary power which, although interesting areas for research, are hardly oriented towards improving

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<sup>6</sup> ICNARC Case Mix Programme Database.



organisational effectiveness. The second was that sociology is only one discipline among several involved in organisational studies of health services. I discuss these issues in later sections of this chapter.

At a more personal level, two aspects of my personal biography account for the research topic and the approach I took. For three years prior to starting my PhD I worked at the Intensive Care National Audit & Research Centre (ICNARC). Connections with the Centre, and, through its work, to intensive care practitioners, facilitated the identification of a substantive area to study for a doctorate. Preceding and then overlapping my period at ICNARC I was introduced to sociology through a Master's course at the University of Surrey. I found this introduction to the discipline of sociology, as it was presented there, an interesting balance (and interaction) of empirical, theoretical and critical investigation of the social world. This thesis is critical in the sense of being 'constructively critical' of HSR. In regards to its empirical and theoretical character, I have steered a 'middle course' between abstracted empiricism and grand theory (Mills 1959) which tends to an empirical (but I would argue not empiricist) approach. In later sections of this chapter I discuss the disciplinary location for this study, commenting on the relationships between HSR, organisational research and medical sociology. In brief, my view is that sociology offers a more basic understanding.

I therefore turned to sociological studies of health care in general, and ICU in particular. These tended to be theoretically informed, but had not, for example, tried to analyse ICU as an organisation. Rather, where ICU has been investigated it has been used as a *vehicle* for investigating something else. To some extent my thesis could be construed similarly, since through ethnographic work I have identified themes for in-depth analysis; however my aim throughout was towards 'understanding the organisation'. So the modified aim of the thesis was to describe ICU as an organisational unit in an empirically adequate way. I felt that logically this should entail not only 'understanding' ICU as an organisational unit but also 'understanding' intensive care as *work* (Strauss *et al.* 1997[1985]). This understanding is demonstrated by developing concepts applicable to intensive care work. In principle, once this is done, concepts could be developed for the ICU as an organisational unit, and I offer suggestions for taking this forward in chapter nine. Thus the thesis examines the work of ICU, and organisational aspects of this are discussed towards the end of the analysis (principally,



in chapter eight). The change of aim reflects a change in conceiving the thesis from an 'HSR' thesis to a 'sociology as applied to medicine' thesis, with a contribution to HSR. The main argument of the thesis is sociological: sociological concepts, themes and arguments are addressed; but it can also be read as oriented towards HSR.

There are three contributions the thesis makes: methodological; substantive; and theoretical. First, methodological: I provide further reasons for applied and policy-oriented research (such as HSR) to include ethnographic analysis (Bloor 1997, Murphy *et al.* 1998, Murphy 2001, Griffiths 2003). Empirically derived description of organisations is important currently, as there is an increasing research interest in 'service delivery and organisation' (SDO) (Fulop *et al.* 2001a). SDO's institutional proximity to policy-makers (the SDO programme is funded by the Department of Health) could result in wrongly predicated policy recommendations, unless accurate understandings of the grounded 'reality' of clinical work in particular settings have been derived and are used in the formulation of policy and policy-oriented research.

The second - and main - contribution is in a sociological analysis of this particular site of modern technological medicine. I analyse the meaning of clinical knowledge in practice, inter-occupational relationships and the organisational 'reality' of ICU as a workshop within the modern hospital. In particular, I develop 'craft' as a useful metaphor for understanding medical work and I remedy shortcomings of nursing theory as applied to ICU. The thesis is within the ethnographic tradition within medical sociology and addresses both traditional and contemporary themes (*e.g.* cross-occupational working relationships; medical technology in practice).

Third, I have a minor contribution to social theory. I evaluate current debates at the interface of medical sociology and social studies of science and technology (SSST) about the appropriateness of a post-structural style of analysis. In particular, I specify points where our understanding of health care is, and is not, enhanced by the adoption of Actor-Network Theory (ANT).

The rest of this chapter is concerned with three tasks: first, to provide a chapter-by-chapter overview of the thesis; second, to place ICU in context; third, to justify the disciplinary basis for the thesis. The third task takes three sections: one on the relationship between HSR and organisational studies; one on the relationship between



organisational studies and sociology (with particular reference to medical sociology); and a third on overcoming tensions and difficulties in multi-disciplinary work.

### Overview of the thesis

This chapter continues with an overview of the historical development and current situation for intensive care, focused particularly on the United Kingdom (UK). Then, in the context of discussing the disciplinary basis for this thesis, I identify my first problematic: aspects of HSR can be under-theorised, or at least neglectful of organisational ‘reality’. Since I regard sociology as an empirical and theoretical endeavour, I consider how the sociological approach I have adopted can be related to findings from other perspectives and approaches to studying organisations.

Chapter two contains a review of two groups of empirical literature. The first group consists of quantitative empirical studies of ICU organisation, largely located in the biomedical literature. The second group consists of ethnographic studies of health care and ICU in particular. The chapter therefore provides more substance on the move from an HSR thesis to a medical sociology thesis. Other literature is reviewed and incorporated into my argument at appropriate points elsewhere in the thesis. For example, I discuss literature at the intersection of SSST and medical sociology, which I found highly relevant to methodological perspectives, in chapter three; literature relevant to the concept of uncertainty in chapter five; literature relevant to a craft metaphor for medical work in chapter six and relevant nursing theory in chapter seven.

Chapter three presents the methodology of the study with a more precise specification of the theoretical perspective for the study. I considered a number of theoretical perspectives, all compatible with an ethnographic approach, and finally settled on a contemporary incarnation of a *practice-theoretical* approach (Schatzki *et al.* 2001). In this chapter I also discuss some of the practical difficulties encountered in undertaking the study.

There then follow five chapters of empirical analysis. The first of these is chapter four, a short, generalised description of ‘a day in the life’ of ICU which highlights some aspects of work routines in ICU for readers unfamiliar with this clinical locale.



Chapter five uses the theme of ‘medical uncertainty’ to analyse how medical knowledge is used in practice. I explore the medical sociological ‘debate’ about uncertainty and present data on different kinds of situated uncertainty in ICU medical work. Using my data on the responses to these different kinds of uncertainty, I infer different levels of saliency to ICU medical practitioners and different statuses for the categories of underlying knowledge.

In chapter six I advocate ‘craft’ as a highly appropriate metaphor for medical work in ICU. Building on my findings in the previous chapter on the nature of knowledge-in-practice, I present the argument that ICU medicine is very craft-like in terms of the *application of knowledge* and its *material nature*. This chapter draws on sociological theories of work and occupations and the inter-disciplinary area of SSST.

Chapter seven analyses intensive care nursing. I found that nursing perspectives as applied to ICU were inadequate, so the chapter contains a critique of the nursing literature as it pertains to ICU, in particular a theoretical neglect of patients’ relatives. In comparing nursing and medical work in ICU, I found more similarities than differences between the two occupations. My explanation is that nursing and medical perspectives in ICU are parsimoniously explained at an organisational level.

I stay with an organisational level of analysis and inter-occupational relationships in chapter eight, where I analyse how ICU consultants control the work of their staff and negotiate with other areas of the hospital. Consultants can be seen to use various rhetorical and institutional devices to enhance their authority.

Chapter nine contains the summary, discussion and conclusion. The implications are considered in three parts: the implications for HSR; the contribution to medical sociology; and a consideration of social theory. For HSR, I consider the how explicit ‘models’ and metaphors might best be used in evaluative research. I reiterate the utility of ethnography as a research method for both critiquing these models and giving due regard to the ‘reality’ of work ‘on the ground’. For medical sociology I extrapolate and speculate from my results to consider broader implications of my findings. Finally, I specify the usefulness of ANT, a theoretical-methodological approach which at one stage appeared very appropriate to the field of study, for medical sociology.



## History and context for intensive care

The first modern ICU is generally thought to have been implemented in Copenhagen in 1952 (Hilberman 1975, Weil *et al.* 1989, Mizock and Weil 1993, ICS 2003). During a polio epidemic, radically reduced mortality rates were obtained by having an attendant, usually a junior doctor, continuously at the bedside who was able to effect artificial ventilation. This led to the development of more sophisticated mechanical ventilators and monitoring equipment, which enabled intensive care to be practised on a heterogeneous group of patients. Many authors note a lineage for intensive care and monitoring back through field hospitals in World War II, a fire in Boston in 1942, neurological monitoring in 1923, to Florence Nightingale in the Crimean War (1854-6). Nightingale is believed to be the first person to establish a separate area for close monitoring of postoperative patients, indicating both how intensive care units were originally formed as intensive *nursing* units and how aspects of the ‘philosophy’ of intensive care have been around for many years. Some advanced medical technology, also, has been around for a century or more: the newborn incubator was invented in the 1880s (Baker 1996) and the mechanical ventilator in 1904 (Snider 1989).

ICUs became a standard feature of acute care in the 1960s (D. Campbell *et al.* 1967, Wiklund 1969, R. Young *et al.* 1974, ICS 2003), and rapidly expanded in both size and numbers from that time. In terms of medical involvement, ICU has been, and remains, a multi-specialty endeavour, combining respiratory and anaesthetic knowledge (patients are required to be anaesthetised so that they can have a tracheostomy<sup>7</sup>).

The concept of critical illness<sup>8</sup> developed throughout the 1970s and 1980s, and a prioritisation and treatment of *physiological distress*, rather than disease entities, is now a key focus of ICUs (ICS 2003). This could be related to the proximity of intensive care and anaesthesia in terms of education, training and history (Safar and Grenvik 1977). Intensive care, like anaesthesia, requires close physiological monitoring of the whole body. ICUs tended to be set up by anaesthetists for close monitoring after

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<sup>7</sup> Tracheostomy: making an opening in the throat in order to insert a tube to enable mechanically assisted breathing (‘mechanical ventilation’). In conversation it is abbreviated to ‘tracky’, which can also refer to the tube itself.

<sup>8</sup> The meanings of *critical illness* and *critical care* overlap with *intensive care*, but have a slightly broader definition. The current UK Health Policy preference is to use the term *critical care* (see ‘Current policy issues’, below). In this thesis I use the terms *intensive care* and *ICU*, except where I cite or refer to published work which has used alternative terminology.



serious surgery, and today, around 95% of intensive care doctors have anaesthesia as a ‘parent specialty’, with virtually all of the remainder being physicians<sup>9</sup>. The creation in 1999 of an Inter-Collegiate Board for Training in Intensive Care Medicine (Soni and Wyncoll 1999, ICS 2003) signalled the move towards medical specialty status in the UK. Formal specialty status does not exist in every country where intensive care medicine is practiced, notably including the USA (Kelley 1988, Fisher 1997).

Medically, intensive care can be defined as

a service for patients who have potentially recoverable conditions, who can benefit from more detailed observation and invasive treatment than can be provided safely in an ordinary ward or high dependency area. It is usually reserved for patients with threatened or established organ failure. (ICS 1997)<sup>10</sup>

The use of the term ‘service’ is indicative: while all acute care can be thought of as a ‘service’, ICU notably provides a service of “detailed observation and invasive treatment” to other providers of acute care. The definition above also hints a construction of difference from ‘ordinary wards’, a feature of ICU as a medical and nursing specialisation which I discuss further in chapters seven and eight.

From a clinical perspective, single or multiple organ failure is a critical marker of ICU treatment, and Smith and Nielsen (1999) explained that the most commonly supported organ is the lung. Intensive care is therefore considered appropriate for patients requiring advanced respiratory support, patients requiring support of two or more organs, or patients with chronic impairment of one or more organs who also require support for acute reversible failure of another organ. Reversibility is a key clinical criterion, as otherwise ICU treatment might be construed as futile (S. Atkinson *et al.* 1994), although establishing the reversibility of organ failure is not straightforward in practice. The need for support of organs can arise, according to the ICS (1997), as a “result or complication of an acute illness or trauma, or as a predictable phase in a planned treatment programme”. In practice, the unforeseen aspects of patients’ trajectories predominate both numerically (four-fifths (81%) of admissions to ICUs in the UK are unplanned<sup>11</sup>) and in terms of medical staff’s involvement (as I discuss in chapter five).

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<sup>9</sup> R. Kishen, personal communication, 22 September 2003, based on ICS Manpower Database.

<sup>10</sup> Very similar definitions can be found in reports by the Royal College of Anaesthetists (Stoddart 1993), the Association of Anaesthetists of Great Britain and Ireland (1988) and the Department of Health (1996).

<sup>11</sup> ICNARC Case Mix Programme Database.



There are differences between the relative provision of intensive care in the UK compared with elsewhere in Europe and North America: the UK is estimated to have one twentieth of the *per capita* provision of intensive care beds of the USA (Bennett and Bion 1999). These differences were highlighted by news media during the “Winter crisis” of 1999-2000, although they are partly due to differing definitions of an intensive care bed. In the UK the standard has been to allocate one nurse per patient, whereas elsewhere in Europe and in the USA the ratio is often one nurse for two or three patients, so care is needed in interpreting cross-country statistics. Assuming nurses are allocated according to ‘clinical need’, this would indicate that ICUs in the UK tend to treat sicker patients, an inference which was supported by Vincent and colleagues’ (1997) survey – it is possible that there is the same level of provision for the most sick patients. Vincent and colleagues also reported that ICUs in the UK tend to be smaller than elsewhere in Europe. It is unclear why there are these differences between the UK and the rest of Western Europe and the USA, but it is of note that the clinical definition of intensive care has been, up to now, more stringent in the UK than elsewhere.

### Current policy issues

Intensive care is expensive: the cost of intensive care is estimated to be around £1000 per patient day (Bennett and Bion 1999), and the interventions are not widely evaluated (Shiell and Griffiths 1991, Gunning and Rowan 1999). ICU is sometimes characterised as an expensive and unplanned resource (King’s Fund 1989, Audit Commission 1999, Department of Health (DH) 2000) which, having relied on local clinicians to develop it, has not been distributed equitably (Metcalf and McPherson 1995). The expense of intensive care results in debates about ‘rationing’ and ‘triage’ recurring from time to time (Singer *et al.* 1983, Jennett 1984a, Kalb and Miller 1989, Shiell 1991, Bion 1995, Metcalfe *et al.* 1997, Sprung *et al.* 1999).

In an effort to ensure that the future development of intensive care is not haphazard, *Comprehensive Critical Care* (DH 2000) (a report of the ‘National Expert Group on Intensive Care’) proposed a broadening of the definition from ‘intensive care’ to ‘critical care’. The term ‘critical care’ is not new (most USA journals in the field contain the phrase ‘critical care’ in their title), and this policy move seems to be bringing British intensive and critical care more in line with North American and



European definitions. The report and recommendation were about more than definitions, however: patients' needs are now to be "determined according to the level of care their condition requires" (*ibid.*: 3). Four levels were defined (*ibid.*: 10), ranging from 'normal ward care in an acute hospital' (level 0) to 'advanced respiratory support or support of two or more organs' (level 3: broadly equivalent to the earlier definitions of 'intensive care'). Patients requiring 'detailed observation or intervention or support of a single organ' were deemed to be at level 2 (roughly equivalent to what had formerly been called 'high dependency'). The key point of the report was that 'critical care' should also encompass 'level 1': patients on a general ward who are "at risk of deteriorating but whose needs can be met with advice and support from the critical care team" (*ibid.*: 10). The organisational implications of this are potentially far-reaching, as the aim is for 'intensive care expertise' to be available to general wards, through the setting up of 'outreach teams' (Lee *et al.* 1995, ICS 2002). I do not comment in detail on policy endeavours in this thesis, but this is one which I could hardly avoid, and I return to it in the light of my analyses in chapters seven, eight and nine.

A survey by the Audit Commission (1999), *Critical to Success*, provided a comprehensive overview of intensive and critical care in England and Wales, as it included ICUs, High Dependency Units (HDUs), mixed (ICU/HDU) units, and specialist (for example coronary care units and neurosurgical) units. For a subset of units the data were linked to ICNARC's Case Mix Programme Database (CMPD). The results of the evaluative component are reported in the next chapter; here I use the descriptive component to contextualise ICUs in the British NHS.

The survey included a number of organisational questions about, for example, the size of unit (the number of beds), its staffing arrangements and its activity. ICUs in England and Wales were found to vary considerably, the variation being reported in terms of inputs, structures, processes and outcomes. Variation in inputs was manifested in the case mix of admissions. Structural differences were found in the scale and size of units and in the configuration of intensive care (that is, for example, whether care is provided in specialist or general units, whether there is an associated high dependency unit and, if so, whether it is adjacent or integrated). Processes which varied included patient and unit management, communication among staff, the humanity of care and efficiency. Outcomes which were found to vary included survival rates (including patient outcomes, adjusted for case-mix) and the quality of life of survivors.



Anticipating the key idea behind *Comprehensive Critical Care, Critical to Success* noted that general ICUs are part of a network of acute hospital care which includes specialist units, HDUs, Accident and Emergency, Operating Theatres (and Recovery) and general wards. As a service, ICU is closely associated with emergency acute care and with Operating Theatres. The configuration of these services and communication between them is likely to be important, as is assessing the ‘demand’ for intensive care. Many factors influencing the use of ICUs were identified, including the availability of facilities, the existence of specialist units, severity of illness and clinical judgement as to the level of care required. This results in the pattern of workload varying across units, and the size of unit was identified as a factor in the availability of facilities at times of increased referrals to intensive care. All this ‘variation’ made me wonder about the feasibility of assessing performance and linking ‘organisational factors’ to outcomes, since it seemed to me that there would always be local factors which could be construed as unique to a particular ICU.

*Critical to Success* made the comment that ICUs can be stressful places for patients, relatives and staff, and another ‘variation’ identified was how well staff were “supported to cope with this very stressful environment” (Audit Commission 1999: 4). Staff often have contact with near-to-death patients and with grieving relatives. Regarding ICUs as stressful places for staff is a recurring theme in the literature (Downey 1972, Guntupalli and Fromm 1996, Goodfellow *et al.* 1997, Fontes Pinto Noaves *et al.* 1999, Sagie and Krausz 2003), although I found comparatively little evidence of this as a general feature of the ICUs I visited. My analysis focuses on the experiences of staff in ICU, and I did not detect stress in terms of their routine work: rather, ICUs are generally very controlled environments.

However, it should be noted that while intensive care may be successful at saving or prolonging life it can also prolong the process of dying. Highly invasive procedures and interventions may prolong suffering without benefit (Jennett 1984b). Quality of life for patients, both in the unit itself and after intensive care, can be poor. It has been observed that ICUs can be quite noisy places, and many patients under sedation can hear. *Critical to Success* noted that special consideration also needs to be given to the care of relatives of those in intensive care, both in terms of the likelihood of bereavement and also because many intensive care patients are unable to communicate.



In focussing on clinical and organisational work this thesis neglects perhaps the most important aspect of intensive care – patients’ experiences. (The main reason for the comparative lack of visibility of patients and their relatives in this thesis is that during the design phase of the study I was overwhelmed by the popular image of intensive care as dramatic, serious and emotionally complex). It is, though, worth noting two sets of comments from the wife of an ex-ICU patient, interviewed on *The Trust: Intensive Care*:

I think I feel more devastated [now] than I did when he was in intensive care. Because the adrenaline does keep you going and they have a personal nurse and everything is very in your face and you can get the answers that you want. Suddenly he was on the ward. It’s not one-to-one care.

With ICU you expect to be called at any time saying your relative is going to have the machine turned off or your relative’s died or can you come in because we need to do something... I never got any of those calls. I always expected them and I still expect them. But they haven’t happened. It’s a strange place to be in.

These comments capture a paradox of ICU: it is undoubtedly a stressful and difficult time for patients’ relatives, yet they are reassured by the medical and (especially) nursing presence. Compared with a general ward, the general climate is controlled and sedate, and, in spite of the highly technological environment, nursing work includes time for reassuring and caring for relatives (as I discuss in chapter seven).

ICUs feature not only medical technology but also information technology, with computer equipment used for recording many clinical readings. The information-rich environment of intensive care and an associated ‘data collecting culture’ (Endacott 2000), coupled to the expense of ICU, has enabled clinical audit to be particularly well developed for this area (Eddleston *et al.* 1996). This usually involves the use of case-mix adjustment (CMA) methods, which for intensive and critical care are the most sophisticated in health services<sup>12</sup>. However, their use in assessing organisational or clinical ‘performance’ is both politically sensitive and statistically problematic, as I discuss in the next section.

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<sup>12</sup> Case-mix (or ‘risk’) adjustment is a way of accounting for differences in health status in a study population. A case-mix adjustment (CMA) method is a mathematical model which, given certain data, can be applied to groups of individuals. Rowan (1997) provided an overview and history of the major CMA methods for intensive care.



## **HSR and organisational studies**

In this section I discuss the relationship between organisational studies and HSR. I intend, through this sociological study of a particular health care service, to maintain a dialogue with the comparatively new area of service delivery and organisation (SDO) research, a subspecialty of HSR (Fulop *et al.* 2001b). My view is that HSR/SDO tends to adopt an organisation and management (O and M) perspective on organisations, the reason being that, like O and M, it has a prescriptive orientation: ‘how to do things better’. The problem with this approach is that some fundamental aspects of organisation, which may have practical or theoretical utility, could be overlooked in the drive towards ‘improvement’ and the adoption of a managerial perspective. A related aim of O and M is to provide models for management. This enables both managers to be ‘taught’ how to manage better and the development of quantitative models (*e.g.* in operational research), and explains the field’s association with Business Schools. I now present three examples from the O and M literature which illustrate its managerialist approach and a preoccupation with ‘models’. I subsequently identify how these approaches are incorporated into HSR and the problems with such an incorporation.

### Perspectives from Organisation and Management

A frequently cited example of a managerial perspective in organisational studies is “Scientific Management”, pioneered by the engineer FW Taylor (1990[1912]). In seeing much labour as inefficient, Taylor sought to advocate what he called “systematic management”, derived from laws, principles and rules, themselves inducted from very detailed analysis and specification of each job. This was necessary, in part, because it is the natural inclination of people to do as little as possible. Work was to be standardised and individualised (Taylor saw work groups as suppliers of negative peer pressure) with incentive schemes defined purely in economic terms. Managers were seen as people who have intellect and a specialised set of skills regarding the organisation of work and the supervision of labour. “Taylorism” can be seen as a contributor to the alienation of workers (Sofer 1973), as Taylor seemed to treat human behaviour as a set of obstacles to be overcome, and has been criticised for being narrowly economic and employer-centred. Motivation for work is not just a question of remuneration – it involves complex interactions of human community, society and personal factors, as brought out



in the celebrated Hawthorne studies.

The studies of the Hawthorne plant of the Western Electric Company in Chicago, undertaken by Elton Mayo and colleagues (1990[1949]), are traditionally cast as contrasting with ‘Scientific Management’<sup>13</sup>. In particular, their results highlighted the workplace as a social system, the importance of informal group membership and the existence of subgroups within an industrial workplace. Thus Mayo and colleagues saw workplaces as more than places of economic reward. However, they have been criticised for adopting a manipulative and superficial managerial sociology which took little account of external factors: they investigated only variables which management could change, neglecting structural or institutional variables which might have had greater explanatory power. In addition, it may be that Mayo and colleagues exaggerated the contribution of teamwork to the economic well being of the factory (Sofer 1973).

A secondary O and M interest is to construct ‘models’ of organisations. The pre-eminent example of this is Mintzberg’s (1983) review and synthesis of research on organisational structure. Mintzberg defined organisational structure as the sum total of the ways in which labour can be divided into distinct tasks and the co-ordination achieved between them. Problems of organisational structure and design arise out of the need to standardise once an organisation has grown beyond a ‘Simple Structure’ (where co-ordination is by direct supervision). According to Mintzberg, work processes, outputs or skills may be standardised, resulting in ideal type structures he called ‘Machine Bureaucracy’, ‘Divisonalized Form’ and ‘Professional Bureaucracy’, respectively. A fifth ideal type, ‘Adhocracy’ is characterised by “sophisticated innovation” rather than standardisation. It is the organisational form of ‘Professional Bureaucracy’ which Mintzberg claimed applies to medical work. The particular case of ICU can also be seen as having features of an ‘Adhocracy’ (Reis Miranda *et al.* 1998: 82), so I will briefly mention the features of both these ideal types.

A ‘Professional Bureaucracy’ (Mintzberg 1983: chapter 10) is characterised by ‘pulls’ to ‘professionalise’ and ‘autonomy’ and the external standardisation of skills through training and indoctrination (a slightly pejorative term which conveys the sense that for a

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<sup>13</sup> The studies are perhaps most famous for the ‘Hawthorne Effect’ – the idea that the study itself, in particular the logic of a controlled experiment combined with detailed observation, contributed to the results which were themselves highly unexpected (Shwartzman 1993).



professional worker to function as such he or she must learn to accept certain ideas uncritically). Mintzberg commented that ‘Professional Bureaucracy’ does not deal well with unconscientious or incompetent professionals, and that the structure tends to be well suited to producing standard outputs but ill-suited to the production of new ones. In organisations such as hospitals, a tension can arise between those inside the profession and those outside. Those outside the profession may attempt either to supervise the work directly or to standardise processes or outputs, but this can both impede the incentive to innovate (in any case weak in a Professional Bureaucracy) and dampen professional conscientiousness. Mintzberg (1983: 211) commented

the fact is that complex work cannot be effectively performed unless it comes under the control of the operator who does it.

This, if followed literally, would render public health and HSR meddling in health care rather problematic.

An ‘Adhocracy’ (*ibid.*: chapter 12) is characteristic of project and research based organisations. Its most significant feature is the flow of information between collaborating groups of highly trained staff. The key coordination mechanism is mutual adjustment. Rather than controlled by ‘professionals’ (as in ‘Professional Bureaucracy’), Mintzberg characterised an ‘Adhocracy’ as controlled by ‘experts’.

I return to Mintzberg’s models, in the light of my analysis, in chapter nine, but for now I will make one general point. Mintzberg’s impressive synthesis is coherent, but he himself cautioned against over-application of his models: “the configurations do not exist... they are just words and pictures on pieces of paper, not reality itself” (*ibid.*: 283). In other words, how they are to be used, for example in evaluative research, requires justification.

### HSR and Organisation and Management

HSR follows O and M’s concern with ‘how to manage things better’ through evaluating performance, assessed in terms of health care quality and efficiency. Similarly, it seems to follow O and M in deriving organisational models. Clinical outcomes are considered the most important aspect of organisational performance (Luft and Hunt 1986), although there has been conceptual development in the area of health care quality to



consider other dimensions (such as equity and humanity). Even so, there remain problems with translating indicators of health care quality to organisational research.

The first problem is that equating case-mix adjusted (CMA) mortality to organisational performance, a common practice in 'evaluating' organisations (see chapter two), is controversial among some clinicians (Boyd and Grounds 1994, Lamb *et al.* 1997) and regarded as unsatisfactory by statisticians (Goldstein and Spiegelhalter 1996). It should be noted that the original purpose of developing CMA methods was for epidemiological risk adjustment for *groups* of patients. Recently, however, additional uses have been proposed for CMA methods: evaluative research; clinical management of individual patients; and assessing organisational performance (Angus and Pinsky 1997, Mourouga *et al.* 2000).

Flood (1994) elucidated the principal problems with operationalising organisational effectiveness as the SMR (Standardised Mortality Ratio) (*i.e.* average CMA mortality). She commented that this neglects other dimensions of organisational performance (such as organisational survival, profitability, teaching) and may confound levels of analysis (*i.e.* patient, unit, hospital, region). Importantly, there are philosophical differences between the SMR as used in epidemiology and the SMR in performance assessment. The purpose of the SMR in epidemiology is to find risk factors and assess, for each 'factor', its statistical contribution to the outcome of interest. But there is an additional feature of its use in performance assessment. Once explanatory 'factors' have been identified, a philosophical, theoretical and moral judgement is needed to determine which factors should be statistically adjusted for and which should be 'assessed'.

Flood (1994) also noted that dimensions of quality of care other than effectiveness should be incorporated into performance assessment. Specifically for the case of ICU, for example, it may on occasion be considered appropriate to admit a patient to ICU for a more humane death than would be the case in a cramped Recovery room. Conceptual development in HSR therefore tends to take several dimensions of 'quality of care' and incorporate them into composite measures of 'organisational effectiveness' (Shortell *et al.* 1994, Rotondi *et al.* 2000). There are many indicators, definitions and dimensions for 'quality of care' (*e.g.* Donabedian 1988, Steffen 1988, S. Campbell *et al.* 2000, Pronovost *et al.* 2001).



Indicators of health care quality often utilise Donabedian's (1974[1966]) structure-process-outcome model. However, Flood (1994) commented that Donabedian's model is not to be understood as three independent measures of quality; rather structure-process-outcome are linked in an underlying model. If this model is treated simplistically analytical problems may arise. For example, relating

organisational factors directly to outcome measures... [potentially] bypasses an understanding of the processes whereby structure affects outcomes.  
(Flood 1994: 388).

Flood noted that the causal order may be the reverse to that expected. 'Better outcomes' could, for example, lead to an organisational structure being construed as having "caused" the good outcomes. But a plausible intervening mechanism is that health care practitioners, purchasers or patients disproportionately choose organisations with "good reputations". Analysing the 'factors' which are related to 'organisational performance' (even if measured according to an array of 'quality indicators') in too much of a rationalistic framework is fraught with potentially flawed findings.

Flood (1994) and Sheldon (1998) have further commented that indicators of quality themselves can be problematic. There is a paradox that monitoring quality may actually reduce quality, for example by displacing informal internal mechanisms for quality control. In a similar vein, organisations must change in order to make them auditable (Power, 1997). There are important questions about analysing evaluation and monitoring as social processes: there are "non-economic and non-rational factors involved in evaluating health care and organizational performance" (Flood and Fennel 1995:163). Performance indicators may cause an unhelpful "myopia", examining measurable rather than important factors, and there is also the danger of 'gaming' (manipulating results). It is also important to note that complete specification of work processes for quality assessment may be difficult; indeed it has been argued that very detailed specification of work is harmful when the tasks undertaken are very complex such as those undertaken in medical care (Flood 1994:398ff, Mintzberg 1983:210-3).

Whilst data collection and statistical adjustment methods have become more sophisticated in HSR, there remains the danger that organisations are still conceptualised rationalistically, following an epidemiological style of adjusting for measurable factors. Sheldon (2000) identified an increasing complexity in effectiveness studies, seeing the analysis of organisational context as a 'third dimension' following



original measures of crude averages and the subsequent use of effect modifiers and case-mix adjustment. He observed that meta-analyses of studies of volume and outcome have shown that the better adjusted the study, the less the effect detected. From an HSR perspective, the increasing importance of studying organisations is reinforced by findings on variations in practice, increasing reporting of medical errors, and differing outcomes and costs between differing systems of delivery. But how the need to study organisations translates to research effort can lack subtlety. Sheldon (2001:4) noted, for example, that while ‘organisational culture’ can be perceived as a potential lever for change, questions remain as to the precise definition of culture, how cultures and subcultures evolve in an organisation and whether and how they are modifiable.

Micro-level (including ethnographic) analyses could, in principle, enable the local organisational contexts to be made visible. Ethnographic work would also be useful in critiquing organisational ‘models’ for evaluative research, a second way in which HSR/SDO follows an O and M approach.

### Models of organisation in HSR

A problem with using ‘models’ in organisational HSR is that they may be either misapplied (in evaluative research) or reified (in policy endeavours). My first example is a current topic for organisationally-related health policy in the UK: the notion that medical work can benefit from safety measures such as those employed in the airline industries. A whole issue of the *British Medical Journal* was devoted to this topic in March 2000 (Reinerstein 2000), following its discussion by several influential clinicians (Blumenthal 1994, de Leval 1997), and it has been advocated with regard to intensive care in particular. The topic seemed so current and apposite that I decided to trace its origins.

What seems to have happened is a confluence of several trends. The first is a matching of the HSR problematic of variations in ‘quality of care’ (Mitchell and Shortell 1997) and a ‘quality management’ approach which makes unfavourable comparisons of health care with other industries (Berwick 1989, Laffel and Blumenthal 1989, Chassin 1998). A second is a Human Factors Engineering approach to ‘medical mishaps’ (Leape



1999[1994], Vincent and Reason 1999) with a link to patient safety (Schaefer *et al* 1994, Barach and Small 2000, Barach 2001). Related to this is an advocacy of less blame allocation in viewing medical errors (MacIntyre and Popper 1983), as these are often held to be ‘system’ (rather than individual) errors. The Human Factors Engineering approach, particularly, claims clear benefits to the work of anaesthetics during the last couple of decades through a safety-critical analogy (Allnutt 1987, Gaba 2000, Helmreich 2000, Sexton *et al.* 2000).

With the overwhelming majority of intensive care doctors being anaesthetists, the importation of a Human Factors Engineering approach into the intensive care arena is easily facilitated (Girotti *et al.* 1987, Wright *et al.* 1991, Hart *et al.* 1994, Donchin *et al.* 1995, Beckman *et al.* 1996, Gunning, 2000). I would speculate that characterising the ICU as ‘safety-critical’ has had “user-appeal”. However, there remain debates about the systems orientation of the ‘safety critical organisations’ approach. An alternative approach - ‘highly reliable organisations’ (Rochlin 2000) – stresses human agency and focuses on human beings’ abilities to overcome ‘gaps’ in continuity of care (R. Cook *et al.* 2000). Furthermore, the normative judgement that intensive care – indeed any kind of medical care – can benefit from such an approach is predicated on an assumption that intensive care work is similar in important and relevant ways to theatre anaesthetics.

‘Models’ for organisations may be helpful in portraying certain of their features, but their appropriateness for evaluative research can be questioned. As mentioned earlier, another model which has been mentioned as relevant to ICU is a combination of Mintzberg’s (1983) ‘Professional bureaucracy’ and ‘Adhocracy’. The same research team also characterised ICU as an ‘uncertainty reducing unit’ (van Rossum 1998). Mitchell and colleagues (1996) characterised ICU as a ‘discretionary-type operating pattern’ (as opposed to either a ‘systematized’ or a ‘developmental’ operating pattern). These models have not so far succeeded in explaining variation in ICU outcomes (see chapter two), which would be a purpose of evaluative research. One could infer that the models – derived from various ‘theories’ – have been either inappropriate or inadequately operationalised.

An alternative approach is to build models from empirical data. For example, systematic empirical investigation of hospital work was undertaken by Strauss and colleagues (1997[1985]) to develop their metaphor of the hospital as a “collection of



variegated workshops”. One research participant told me that he viewed ICU as a ‘Central sorting office’ which rang true at the time as a highly appropriate conception. However, metaphors, while having intuitive appeal, are also inevitably limited at some point. My view is that, at the least, a model or metaphor needs empirical validity. Furthermore, different models (or metaphors) may be useful for some purposes but not others. In any event, systematic empirical investigation is required to ascertain their validity to avoid the dangers of misapplication or reification.

Overall, then, HSR/SDO has tended to adopt a “modified positivist” or “functionalist” theoretical perspective (Alderson 1998), which can decontextualise organisations, and, rather than seeing organisations as social, unstable or creative entities, they are treated somewhat mechanistically with an emphasis on risk factors, measurable entities and variables for manipulation. Indicators of ‘quality’ or ‘performance’ can be applied without an adequate understanding of the ‘grounded reality’ of clinical work.

Axiomatic to this thesis is that either developing a ‘model’ (or metaphor, or analogy) or using quality indicators can only work if they are built on systematic empirical data. It is vital to capture not just what practitioners or experts say their work is like, but also what work gets done and how. Finally, we can note that there is a normative expectation in both HSR (SDO) and O and M, with both fields wanting to make recommendations for improvement. In turning to sociology’s relationship to this area of study, I noted that sociology has a greater emphasis on explanatory description than normative prescription.

### **Sociological study of organisations**

Sociological approaches to studying organisations, in contrast to O and M theory, have a more analytical than practical focus, considering more basic questions such as “what is an organisation?” The central question in O and M, “how can an organisation work better?” is reformulated into the (logically prior) question “what makes an organisation work (at all)?”. Such an analytic focus led a disciplinary founder such as Weber (1990 [1924]), to consider the nature of authority and power in organisations. Following Weber, work in medical and organisational sociology continued in parallel, with some individuals making significant contributions in both fields. It is alleged that more recently the connections have to be made by the reader of medical sociology literature



(Griffiths 2003). Davies (2003) noted an absence of a sociology of organisations from medical sociology (at least so far as the journal *Sociology of Health and Illness* represents the sub-discipline of medical sociology), but it is important to note that a general distancing of mainstream sociology from organisational studies was also identified by Parker (2000).

Earlier medical sociology built on Weber's analyses of authority in organisations. He outlined three ideal types of 'legitimate authority': traditional, charismatic and rational. It is the rational, or bureaucratic, form of legitimate authority which is said to characterise modern organisations. There are two facets to this form of authority. The first is that authority is vested in the *office* (job) of a bureaucrat, with specified chains of command and rules of behaviour. The second is that superiority is attained by the role of technical knowledge. Bureaucracy can be regarded as a technically superior form of organisation. Parsons (1974[1957]) pointed out that Weber failed to distinguish between the authority of administrative office and the authority of expertise or profession, so the trend to bureaucratisation is limited in medical environments. In his study of a mental hospital Parsons differentiated between administrative and operative systems: the administrative function was organised around the definition of the "psychiatrist as *par excellence* the competent expert in mental illness" (*ibid.*: 93). That is to say, the psychiatrist has authority as a member of a professional group. However, Freidson (1988[1970]) contended that the expertise of professions is institutionalised into something similar to bureaucratic office, and he resisted the implicit assumption that 'technical expertise' is in any way functionally neutral. With regard to health service organisation, Freidson commented that it is not just the fact that health care organisations are larger (and therefore more 'bureaucratic') which is responsible for dehumanising care, but also that professional practices themselves contribute to the unhappy experience of the patient.

Where sociology links most conspicuously with organisational studies is in terms of theory. Theoretical developments within 'organisational theory' are correlated with wider trends in social theory and theories of work and employment; there are therefore strong parallels between how society is viewed and how organisations are viewed (Silverman 1970, Reed 1992). The field of organisational studies and organisational theory is a fractured and disparate one (Reed 1999[1996], Clegg and Hardy 1999[1996]), and there are many ways of viewing the field.



Reed's (1992) overview of the sociology of organisations pointed out an oscillation between focusing on structure and focusing on agency, and a general move from the study of 'formal organisations' to a study of 'organising' (*i.e.* an 'ethnomethodological turn'). Reed identified a number of sociological perspectives on organisations which provide conceptual and analytical devices for investigating and theorising organisations. Three in particular, which had the potential to feed into this study, were organisations as: social structures; negotiated orders; and sites of social practices.

The perspective of organisations as 'social systems' regards organisations as social units directed to the achievement of collective goals (Parsons 1974[1957], Perrow 1976[1961], Sofer 1973, Etzioni 1975). Parsons commented that it is having a specific, collective goal which distinguishes an organisation from another kind of group, for example, a community or association. Perrow distinguished between official and operative goals. Official goals are purposively vague, often for public consumption and in general inadequate for explicating organisational behaviour. Operative goals are a combination of "policies" which may or may not be derived from the official goals: in some cases it may be necessary to prioritise between goals. For example, a teaching hospital is involved in patient care, teaching and research, three activities which are not always compatible. Perrow commented that the discernment of operative goals is difficult, requiring analysis of decisions, personnel practices and alliances in each organisation studied. In addition, the shared goal in a hospital is somewhat vague, being something along the lines of "to return patients to the outside world in better shape than when they came in", so the appeal to a superordinate goal does not assist individual carers in their negotiations over a single patient (Strauss *et al.* 1963).

The often ambiguous nature of goals enables different interpretations, hence what has become a dominant perspective in sociological studies of health care organisations, the 'negotiated order' perspective. As Strauss and colleagues (1963) recognised with hospitals, organisations are inherently disordered places. There is a contrast here with 'systems theory', where structures are seen as possessing a developmental logic which imposes order on individuals and groups. Fundamental to the perspective of negotiated order is the idea that the organisation has no separate existence as an entity independent of its grounding in social interaction. Thus Silverman (1970) emphasised the 'action frame of reference' and accused 'systems theory' of reifying organisations.



In the same spirit, Strauss and colleagues' (1963) work on the negotiation inherent in hospital work contended that organisational studies, at least up until that point, over-estimated the stable features of organisation and underplayed the processes of organisational change. The hospital is an inter-relation of professionals and non-professionals within a professionalised locale. Different professions have different ideologies as well as different practices. Work rules must be agreed upon; they periodically fall into disuse until some or other disaster occurs; "too rigid a set of rules would only cause turmoil and affect the hospital's overall efficiency" (Strauss *et al.* 1963:153). When negotiations break down there may be a number of resources employed – one example being an appeal to authority, for example a senior manager. According to Strauss and colleagues, a hospital can be visualised as a place where numerous agreements are made or forgotten and continually established, renewed, reviewed, reworked or revised.

The more formalised 'permanent conventions' set partial limits on the scope of what may be negotiated day-by-day by providing the background; however the negotiated order must be continually worked at. All this was an attempt to recognise the political bargaining, stakeholding and coalitions incumbent in the utilization of, and competition for, scarce resources. The power structure is merely a shorthand for the patterning of negotiated outcome; Strauss and colleagues termed this "structure in process". It is seen particularly in places with professional and semi-professional staff. A criticism of this perspective is that it seems to emphasize the freedom within which social order works. That is to say, further modification of the theory to account for the "structuring of processes" is required (Reed 1992).

A less common sociological perspective is to see organisations as 'sites of social practices'. This perspective attempts to overcome the theoretical duality between 'structure' and 'process'. In this perspective administrative mechanisms, whereby managers realise effective regulation and control of performance, embody both structural resources (for example organisational rules, hierarchy) and processural facilitators (for example ideologies, coalitions, cultures). Both structural resources and processural facilitators become the focal points for power struggles – these power struggles form the underlying dynamic for change. In general organisations are conceptualised as heterogeneous, non-unitary, dispersed and fractured entities – there can be no unambiguous or fully coherent meta-narrative. Knowledge is seen to serve



particular interests; discursive practices surround subjective calculations and assessments.

This perspective offers some promise for empirical analysis, and is a version of the perspective that I adopt as the broad theoretical backdrop to this study (which I discuss in chapter three). Recent formulations ‘practice theory’ embraces “embodied understanding” (Schatzi 2001:8). Organisational and social theoretical perspectives can often seem abstruse or intangible, which perhaps highlights the difficulty of discerning the ‘organisation’ itself. Rather than engaging in research which could be construed as unduly ephemeral, I felt that I should, at the very least, account for empirical research findings in the broader literature. One problem with this is that many of these empirical findings have been based on studies from other disciplinary perspectives. This is an issue I address in the next section.

### **Multi-disciplinary research**

This thesis is intended as a sociological understanding of the practice of high technology medicine. It is further intended as a contribution to the academic and scholarly discourse about health services organisation, the main focus of which is research published in the field of HSR. HSR, as a subspecialty of public health, is an applied multi-disciplinary research area focussing on the quality and efficiency of health services. Gibbons and colleagues (1994: chapter one) alleged that multi-disciplinary research is becoming more common, in part due to increasing accountability, quality control and involvement of ‘users’. Most empirical studies of the organisation of intensive care have not been sociological, and it was clear from the outset that in producing this thesis I would need to evaluate findings from other disciplinary perspectives. But these different perspectives (inevitably) have quite different concerns from medical sociology.

Most importantly, in this context, are the perspectives of medicine (including public health) and nursing. Both these have a patient-level, individual focus – hence in seminars and presentations there are often individual patients as stories and examples. This reinforces nursing’s and medicine’s self-perceptions as inherently moral endeavours. But the values assumed within nursing and medicine may not be



conducive to scholarly inquiry from a range of other perspectives. Latour and Woolgar (1986: 16), for example, presented an intriguing example of basic scientists becoming frustrated with medics delving into their fields:

...Bill and Mary come in suddenly. They are at the end of a discussion. "I don't believe this paper," says Bill. "No, it's so badly written. You see, it must have been written by an M.D." They look at Spencer and laugh... (excerpt from observers notes).

It is not so much that medicine is a 'hard science' and therefore feels superior to social science, which is how a putative problematic relationship between medical and qualitative research is often characterised. Rather, medicine, as inherently moral, can be construed as 'too important' to be discussed only in 'academic' terms, and this could be seen to apply to HSR (a subspecialty of public health, which is itself a medical specialty).

My interests, however, were academic, and I was more concerned with explaining what is than with recommending what should be. I therefore preferred to try to take a dispassionate approach to my research (I discuss this further in chapter three). There are undoubtedly tensions between producing knowledge for its own sake and doing research which has a pre-defined utility value. Nevertheless, there are both theoretical and practical grounds for adopting an approach which is primarily knowledge production rather than utilitarian. My main comment is that research does not have to be pre-defined as useful in order to have important applications. The challenge for this study is for its findings to reflect the complexity of the organisation of intensive care, yet also have a simplifying and clarifying function so that the results and interpretations can be meaningfully applied.

The processes of simplification and clarification necessary for application (which is an HSR requirement) can be achieved by integration with theoretical ideas and explanations. 'Theory' is best understood as "a set of explanatory concepts chosen on account of their usefulness" (Silverman 1998: 109). That is to say, theory can be considered as a way of viewing the data, which is relevant to the particular problem being studied. All academic research must draw a balance between a theoretical and empirical approach. While theoretical ideas can be exciting, a systematic empirical dimension is what makes the research sociological. In saying that this research is *empirical* I would want to resist the label 'empiricist'.



Williams (2000b) discussed the issue of empiricist research in relation to *social research*, and several of his comments can be transferred to HSR. He alleged that often social research is practiced with little or no ‘theoretically driven investigation’ - thus there is little or no connection to traditional disciplines. His main concern was that research practitioners may be being trained with “little or no knowledge of sociological or political theory (etc.)” (*ibid.*: 163). Thus the *technical focus* of social research practice emerges: ‘answering questions’ and ‘solving problems’. He argued that the focus on ‘problem-solving’ calls into question the disciplinary status of social research:

missing... are the ontological foundations that are present in ‘traditional’ substantive disciplines and are able to generate theory to be tested by research. (*ibid.*: 163)

The related problems of empiricism and technicism, which Williams identified in social research, are exacerbated in HSR. Like social research, HSR features an emphasis on ‘problem-solving’. But, more importantly, it appropriates particular disciplinary approaches with a distinctly pragmatic orientation to methodology. It thereby has become primarily a trans-disciplinary methodological project (Pilgrim and May 1998:51), with little concern for the “deep structures” (Rowland *et al.* 1998:135) of disciplines. As Pilgrim and May argued, in such a disciplinary context, explanation is subordinated to description and there is the threat (for social scientists in particular) that the security provided by one’s ‘parent discipline’ can be lost.

The problem identified with HSR is not wholly its *multi-disciplinary* character. For example, G. Cooper (1999: 6.2) remarked that in social studies of science and technology “theoretical development is often non-disciplinary”. Pilgrim and May (1998:49) commented:

In principle, [multi-disciplinary working] could be the basis of the development of exciting interdisciplinary projects and the fruitful construction of a new, transdisciplinary model of research practice.

However, with HSR, where multi-disciplinary research is also practically oriented (Hammersley 2000) explanation can be subordinated to description (Pilgrim and May 1998). The practical orientation of HSR is linked to a dominant prescriptive and normative framework: as already discussed, HSR is oriented towards ‘improvement’ in health care quality and efficiency.

Social scientists might be hesitant to criticise or avoid this normative discourse for



institutional reasons, or because it seems churlish to criticise the putative medical mission of human betterment. Now, while it can be argued that cross-disciplinary work can achieve new insights, it seemed to me that without a secure disciplinary base I would be vulnerable to a dominant public health discourse asking too frequently ‘what are the practical implications of your research?’ It is not that I do not want the research to be useful, but that is not its primary objective. The primary objective of this research is, therefore, understanding: the logic of inquiry is towards *exploration* and *explanation* (see chapter three) rather than the *evaluation* of HSR.

The discipline of sociology is always likely to have an ambivalent relationship with the object of its analysis, but this seems particularly marked in medical sociology (Strong 1979b, Pilgrim and May 1998), often summarised as the tension between “sociology of medicine or sociology *in* [or *for*] medicine” (Straus 1957, 1999). As Armstrong (1987) commented, the contribution of sociology to medicine could be undermined if it becomes incorporated into “biopsychosocial medicine”. In a similar way, the capture of organisational research by “narrow managerialist agenda” could lead to a divorce from its basic disciplines. As a result, the field of study may have little “intellectual sparkle” (Ferlie 1997:184).

Several examples of health research which take explicitly sociological and theoretical approaches show their potential benefit. The first example is Wood and colleagues’ (1998) paper, which examined the difficulties of innovation in a clinical context by utilising theoretical ideas derived from post-structuralism and Actor Network Theory (ANT) (Latour 1987, Law 1992). An analytical feature of ANT is that the world is made of ‘hybrids’, in which politics, science and technology are mixed (Latour 1993[1991]). This makes it difficult to maintain analytical distinctions between nature and culture. Applied to the area of evidence-based medicine, Wood and colleagues showed that there was no simple entity “the body of evidence” – there were simply more or less competing reconstructions of evidence able to support a number of different positions. The authors concluded that there is a greater need to tap the tacit and experiential knowledge of practitioners and to incorporate evidence and practice in a more immanent relationship.

A second example of a sociological contribution to understanding of health care organisation comes from Pope’s (1991) paper concerning the organisation of surgical



waiting lists. Pope reviewed the existing conceptualisations of waiting lists as pools or queues, and through an ethnographic study was able to provide evidence that a better conceptualisation would be of a 'store'. She found that the "low level bureaucrats" responsible for administering the waiting lists on behalf of the hospital managers were more often actually working on behalf of the surgeons. They could be thought of as 'storekeepers', and hospital management were their 'customers'. Thus the politically useful (for managers) conception of waiting lists as a 'backlog' was undermined and an intriguing new metaphor with policy and managerial relevance can be developed.

General concepts can be derived from ethnographic research, also. In organisation studies, for example, the concept of 'uncertainty' is a fundamental component in the perspective of 'Structural Contingency', a perspective which has been called the "normal science" of organisational research (Donaldson 1999[1996]). But 'uncertainty' itself was only recognised as important through Crozier's (1964) landmark organisational analysis. Crozier related uncertainty to the control of power by technical staff in bureaucratic organisations, an idea which was taken up by Thompson (1967) in his synthesising work: he argued that organisations have a technical core which must be protected against uncertainty. Thus an ethnographic finding was formative in what became the 'dominant perspective' in organisational studies.

These examples show how the careful and meaningful integration of theoretical ideas with empirical data can achieve the aim of relevant and practical research findings. In developing concepts and theories through an in-depth organisational investigation of ICU, my analysis is oriented towards, but not constrained by, the concerns of SDO researchers and health care practitioners. One challenge for this study, therefore, is for its findings to reflect the complexity of the organisation of intensive care, yet also have a simplifying and clarifying function so that the results and interpretations might be meaningfully applied. The processes of simplification and clarification will be achieved by integration with theoretical ideas. Following Silverman (1993, 1998), theories allow links, via abstract concepts, to be made to other similar situations or problems. The primary purposes of theoretical and conceptual development as it is played out in this thesis, exploration and explanation, are thus different to the primary purposes of theoretical and conceptual development as it is played out in HSR, which is evaluation.

In chapter two I add substance to these ideas, with reference to empirical studies. I



summarise a large volume of quantitative evaluative studies of the organisation of ICU, which have identified organisational ‘factors’ which are associated with ‘effectiveness’. It is apparent that the ‘factors’ which have been identified are those which are most easily measured and quantified. Furthermore, notwithstanding the HSR conceptualisations of health care quality, nor reservations about the equation of ‘clinical performance’ with ‘organisational assessment’, the reports of many empirical studies assume rather simplistic mechanisms relating ‘factors’ and ‘effectiveness’.

In principle, such mechanisms could be identified through ethnographic work, as I illustrate through a review of ethnographic studies in acute health care. The potential contribution of ethnography to HSR in this way was important in my reformulation of this research, and in changing the focus of the research question. Nevertheless, the fulfilment of ethnography’s potential is this thesis’ sociological contribution to the broad field of organisational HSR.



## Chapter Two

### Review of Empirical Studies

This chapter provides more detail on my move from an HSR study to a study in the field of medical sociology. This process was crystallised through reviewing substantive empirical literature relevant to the organisation and work of intensive care. The studies reviewed fall into two groups: quantitative studies which have attempted to evaluate organisational effectiveness (for these I restrict my review to intensive care) and qualitative (mainly ethnographic) studies of acute health care. My move from HSR to medical sociology was partly a result of recognising of the shortcomings of the first group of studies, and the methodological contribution of this thesis in arguing that some of these shortcomings can be overcome by ethnographic research.

The quantitative studies, which attempted to measure an organisational factor or test an organisational intervention, were published in biomedical, nursing and health services research journals. There is a large volume of these studies, which can be attributed to the ‘data collecting culture’ (Endacott 2000) of intensive care, the development of sophisticated case mix adjustment (CMA) methods (Rowan 1997) and an assumption that ‘organisation’ is a missing factor which can explain differences between ICUs of CMA outcomes (M. Young *et al* 2000). A few studies developed or tested a theoretical framework, but these tended to be based on normative expectations rather than properly empirical descriptions of intensive care work *in situ*. Indeed, many of the studies cannot properly be considered ‘HSR’ since ‘organisational performance’ and measures of health care quality have been rather simplistically equated.

In response to these shortcomings, I therefore reviewed ethnographic research in acute health care. Sociological studies, with one notable exception (Strauss *et al.* 1997[1985]), have tended not to be concerned with ‘organisation’ *per se* (Griffiths 2003, Davies 2003), but have yielded important results, which are indicative of



ethnography's potential. In my own analysis several broad themes which were pertinent to organisational analysis emerged, and in these cases, where social scientific findings are especially relevant to my analysis, I have incorporated them into my empirical chapters.

### **Evaluative studies of ICU organisation**

There is a relatively large number of organisational studies of ICUs. A tabulated summary of the empirical findings on organisation and outcome has been published elsewhere (Carmel and Rowan 2001, reproduced in Appendix one), where the search strategy used to identify studies was reported. Here I provide a more interpretative review of that evidence, firstly reviewing the methods and findings of the three major studies, and then summarising the findings of the others. The studies were undertaken mainly in North America and Europe, adopted quantitative approaches and attempted to relate 'organisational factors' to patient outcome.

In reviewing these studies, a preliminary question is: is it legitimate to regard ICU as an entity? Provisionally, the answer is 'yes', as there are physical boundaries which clearly mark out the territory of ICU. It is worth commenting that ICUs are part of a network of acute and critical care, and are fully embedded within the hospital. Thus, an ICU's 'organisational performance' (however assessed) is inextricably intertwined with the 'organisational performance' of the hospital of which it is part. (Most CMA methods for outcomes following intensive care implicitly acknowledge this as they take in-hospital mortality as their primary outcome measure).

Three major large scale studies have specifically examined the organisation and management of intensive care, by analysing patient-, staff-, and unit-level quantitative data. The first, the APACHE III study (Shortell *et al.* 1994, Zimmerman *et al.* 1993), collected data from 42 ICUs across the USA (26 ICUs were randomly selected, the remainder volunteered to participate). The second (Mitchell *et al.* 1996) collected data from 25 ICUs in the Pacific Northwest region of the USA. The third, the EURICUS-I study (Reis Miranda *et al.* 1998), collected data from 89 ICUs across Europe.



A number of other studies have also reported on relationships between organisation and outcome. I present an overview of these results without discussing the studies in detail, as they either comprised small sample sizes (one or two ICUs) or, where sample sizes were larger, the ‘organisational’ finding was incidental to the main purpose of the study.

The three major studies used survey methods for obtaining data from staff and leaders and individual patient data to adjust for case-mix, all aggregated to ICU-level for analysis. Two of the studies also utilised a limited amount of qualitative observational and interview methods. This was most extensive in the APACHE III study (Zimmerman *et al.* 1993), where four researchers conducted interviews and observations for two days each at nine ICUs. For EURICUS-I, the qualitative component, lasting two days at each unit, was really an extended project administration visit with little analytical value. The interviews conducted as part of these visits may have shed some light on the quantitative results, but one is left with the feeling that the qualitative research was not approached with the sophistication and rigour apparent in the quantitative surveys and collection of clinical data in the same study.

The quantitative approaches raise the issue of the *meaning* of the Standardised Mortality Ratio (SMR) at the level of the ICU (as discussed in chapter one). Each study took a different theoretical approach and this was reflected in the justification (or otherwise) of using the SMR for the purpose of assessing performance. In both the APACHE III study and the study by Mitchell and colleagues (well conceptualised HSR studies), the importance of other measures of organisational performance was recognised, although the meaning of the SMR was not discussed in depth. In the EURICUS-I study, on the other hand, there was quite a sophisticated theoretical and statistical background, but this did not translate well into the empirical analysis. So the researchers used a version of case-mix adjusted (CMA) mortality as a proxy for ‘clinical performance’, but stated:

Used in this way, clinical performance merely reflects a ranking of ICUs and cannot be interpreted as being indicative of quality.  
(Reis Miranda *et al.* 1998: XX)

Reading between the lines, there seemed to have been either some confusion about the issue, or tensions within the research team about using the SMR for assessing ‘clinical performance’.



## Key findings of APACHE III (1993-4)

Turning first in detail to the design and main findings of the APACHE III study, Shortell and colleagues (1994, Knaus *et al* 1993) collected survey data on organisational and management factors and clinical data on 17,440 patients. Prior to the study, a detailed conceptual and analytic model was drawn up, whereby five indicators of 'organisational performance' were related to organisational factors (Shortell *et al.* 1994: 510-513). Organisational performance was measured in terms of: clinical effectiveness (hospital mortality adjusted for case mix using the APACHE III method); efficiency of utilisation (ICU length of stay adjusted for case mix); technical quality of care (self-evaluated); ability to meet family member needs (evaluated by ICU staff); and ICU staff satisfaction, which was operationalised as nursing turnover. It is important to note that organisational performance was considered more broadly than both patient outcome solely or even broader 'quality of care' measures, which would tend to keep the unit of analysis at the level of individual patient. However, one problem with some of the measures used was that they were self-evaluated so could amount to little more than practitioners' perceptions. Such perceptions are important, but need to be interpreted as such.

Four hypotheses were tested, relating four organisational factors (technological availability, task diversity, nurse staffing and 'caregiver interaction') to the five measures of organisational performance. Caregiver interaction was estimated using a measure combining culture, leadership, coordination, communication and conflict management abilities. Organisational performance was hypothesised to be positively associated with greater levels of available technology, higher nurse: patient ratios and greater levels of caregiver interaction. It was hypothesised to be negatively associated with greater number of conditions being treated in the ICU (greater 'task diversity').

Overall, there was partial support for all study hypotheses and a number of positive and negative results were found. The five performance measures were not highly correlated with each other, indicating their several utility, and different factors were associated with different aspects of 'organisational performance'. Task diversity and technological availability were associated (in the expected directions) with CMA mortality (a measure of clinical effectiveness).



Nurse staffing ratios and caregiver interaction were not associated with clinical effectiveness. However, caregiver interaction was negatively associated with CMA ICU length of stay (a measure of efficiency) and positively associated with ‘evaluated quality of care’ and ‘evaluated ability to meet family needs’. ICU staff satisfaction (nursing turnover) was negatively associated with ‘evaluated quality of care’, ‘evaluated ability to meet family needs’. It could be argued that the ‘[self]-evaluated’ measures were all inter-related to a notion such as ‘staff morale’. Although negative findings might be due to problems of measurement, it seems interesting and plausible that some aspects of organisational functioning (such as caregiver interaction and nursing levels), while not impacting overall clinical *effectiveness*, could have an impact on *efficiency*. The implication would be that for patients in extreme physiological distress (such as in ICU), successful treatment is affected mainly by individual medical decision-making. But how well the ICU relates to other organisational subunits, discharging patients in a timely manner, for example, could be dependent on internal interactions (Shortell *et al.* 1994: 517).

Between a year and eighteen months after the initial collection of patient and survey data, a series of case studies were undertaken on nine ICUs to identify “superior organisational practices” (Zimmerman *et al.* 1993:1443). The nine ICUs were purposively sampled according to their clinical outcomes (CMA hospital mortality), thereby demonstrating the normative intentions and expectations of the investigators. The investigators were ‘blinded’ to the CMA hospital mortality rates (they knew how units were selected for case study but not which units were which). They interviewed up to twenty respondents per site, including the medical director, the head nurse, the hospital director of nursing and samples of nurses on each shift. Interviews were semi-structured and lasted about ninety minutes. Topics under discussion included, for example: unit strengths and weaknesses; teamwork; perceived effectiveness; administrative responsiveness; problem-solving; communication; and special issues including triage and ‘Do Not Resuscitate’ orders. An unspecified period of time was also spent in observing daily routines, such as ward rounds and changes of shift and interactions among physicians, nurses and families. Given that the visits lasted two days, included time for interviews and involved four researchers, it seems as though approximately three or four person-days were spent observing the work of each ICU.

The study investigators then compiled a composite report and collaboratively ranked the



units according to their “anticipated ranking” of CMA hospital mortality. That is, they ranked the units according to their perception of the units’ clinical effectiveness. The researchers’ ‘predictions’ bore no relation to the ‘objective’ measures of clinical effectiveness (CMA hospital mortality) nor efficiency (CMA length of ICU stay).

Despite this, the authors stated that

Superior organisational practices... were related to a patient-centred culture, strong medical and nursing leadership, effective communication and coordination and open, collaborative approaches to solving problems and managing conflict. (Zimmerman *et al.* 1993: 1443)

They claimed that “superior organisational practices” resulted in a greater sense of collegiality and a patient-centred culture. They also stated that effective leaders (nursing and medical managers and nursing shift leaders) exhibited the following characteristics: clinical credibility (*i.e.* technical skills); presence on the unit; a supportive approach; timely decision-making; a commitment to continuous learning; and involvement in hospital activities (*e.g.* Ethics Committees). Throughout Zimmerman and colleague’s (1993) paper there is an implied link between ‘superior organisational practices’ and high organisational performance, but a close reading shows that this is not supported by the empirical data.

The authors noted that their failure to rank correctly may have been due to differences between ‘effectiveness’ and ‘efficiency’ which may have been difficult to disentangle in the observational study. They concluded:

This failure may, in part, be due to the many factors that are relevant to organisation performance... performance assessment cannot be based on structural or organisational questionnaires alone. (*ibid.*: 1450).

The APACHE III investigators thereby found empirical support for their initial approach - that assessing ‘organisational performance’ needed to be determined along several different dimensions. But in addition, the difficulty of disentangling these in qualitative observation was important for me in seeking to develop a more exploratory, observational approach.



## Key findings of Mitchell and colleagues (1996)

Mitchell and colleagues (1996) attempted to link “structures, processes, and organizational and clinical outcomes” for 25 critical care units in 14 hospitals in the Pacific Northwest region of the USA. They characterised ICUs as a *discretionary-type operating pattern*, postulating that

a discretionary pattern of organizational structure and process factors is predictive of critical care unit performance, *i.e.* desirable patient and organizational outcomes (Mitchell *et al.*, 1996: 353).

The conceptual basis for their research was a general model concerning the relationship between organisational structures and tasks which had been developed by Van de Ven and Delbecq (1974). Van de Ven and Delbecq had assumed that “the kind of work is the determining factor of work-unit structure” (*ibid.*: 183), and used questionnaire data on ‘task difficulty’ and ‘task variability’ to statistically explain “structural variations between work units”. They thereby empirically derived three “unit-level operating patterns” (*ibid.*: 184-5): *systematised* (low variability tasks, highly detailed work steps and specifications); *discretionary* (medium variability tasks, specified outputs with a “repertoire of means” to guide tasks); and *developmental* (high variability tasks, completely unspecified means of achieving objectives).

Mitchell and colleagues used Van de Ven and Delbecq’s model, and characterised ICUs as a *discretionary-type* operating pattern, by reference to earlier research on ICUs (Overton *et al.* 1977, Leatt and Shneck 1981). However, there are at least two difficulties with Mitchell and colleagues’ approach. The first is that the models and reports on which Mitchell and colleagues relied had been based on questionnaire data, therefore potentially limited in scope. The second (more fundamental) issue is that their application of Van de Ven and Delbecq’s model seems to me to be questionable. For while Van de Ven and Delbecq discussed *task* in terms of difficulty and variability, Overton and colleagues (1977) and Leatt and Shneck (1981) investigated *technology* in terms of uncertainty, instability and variability. As ‘technology’ was taken to include both raw materials and *techniques*, a theoretical connection between ‘technology’ and ‘task’ is reasonable. However, these latter two studies found empirical support for characterising ICU technology as ‘high instability’, ‘high uncertainty’ and ‘low variability’. Translating this to Van de Ven and Delbecq’s model, ICUs would be characterised as ‘high task difficulty’ and ‘low task variability’. ICUs would then fall



into Van de Ven and Delbecq's category of *systematised* mode, rather than *discretionary* mode as contended by Mitchell and colleagues.

Notwithstanding these difficulties, I now summarise Mitchell and colleagues' analysis and findings. They operationalised "discretionary-type operating pattern" into four dimensions: task standardisation; nursing expertise; discretion; and information flow. In terms of their empirical findings, Mitchell and colleagues did not find any association between any of their measurements and clinical effectiveness (CMA ICU mortality). There were, though, associations with organisational variables, such as nurse retention. With regard to the negative finding for CMA ICU mortality, they commented,

What we may have seen is the effect of nurses and physicians buffering patients from ill effects of problematic interpersonal or organizational aspects of unit functioning (Mitchell *et al.* 1996: 362).

The idea of 'buffering' is an intriguing one, and I return to it in my discussion on the findings on 'error' in ICU, below.

### Key findings of EURICUS-I (1998)

The third major organisational study, EURICUS-I (Reis Miranda *et al.* 1998), consisted of five sub-studies: Patients and Facilities; Organisation; Personnel; Culture; and Finances. Eighty-nine ICUs from twelve European countries participated, but the ICUs were selected neither randomly nor as representative of the country (the ICUs for each country were in one region; for the UK this was eight ICUs in the Northern and Yorkshire region). Each sub-study was conducted by a different team and concentrated on a particular set of concepts, although a systems approach (inputs, throughputs and outputs) was common to all the sub-studies.

A brief discussion of ICUs' organisational structures (Reis Miranda *et al.* 1998: 81ff) referred to two of Mintzberg's (1983) ideal-types: 'Professional Bureaucracy' and 'Adhocracy' (as discussed in chapter one, pp.22-3). Unfortunately, there was little justification for describing ICUs in these terms and the study findings were not related to these types. In chapter nine I return to this matter: in brief my point is that Reis Miranda and colleagues were right to characterise ICU in this way, but could have made more of it in their study.



Overall, results of the study showed that type and size of hospital were significantly associated with ICU characteristics and that there was variation both within and between ICUs. In general, Reis Miranda and colleagues reported that planning was not tailored to meet volume or type of patients. In interviews with ICU leaders, the professionalism of the team, teamwork, quality of work developed in caring for families and the sense of organisation were identified as strengths; organisation and staffing issues (lack of training, high staff turnover, staff shortage, staff conflicts), inappropriate buildings and lack of resources were identified as weaknesses. It ought to be noted that there is possibly a degree of rhetoric in these responses, although Reis Miranda and colleagues' analysis went no further than reporting these responses.

The study attempted to relate aspects of organisation to 'medical performance', operationalised using a measure of CMA hospital mortality. The results were inconclusive. The authors noted that this may be partly due to the levels of analysis. 'Medical performance' was measured at an individual (patient) or inter-individual (doctors and nurses) level, whereas organisation and management attributes were generally measured at a collective level (ICUs). Distinguishing between these levels is not always straightforward. Notwithstanding the reservation that "ranking of ICUs cannot be indicative of quality" (Reis Miranda, *et al.* 1998: XIX), the authors tested various organisational attributes against 'medical performance'. Due to apparent difficulties of analysis, they divided the patients into 'low risk' and 'high risk' according to the predicted probability of hospital mortality. Results from each of the sub-studies were reported and then the two most significant variables from each sub-study were placed in a combined model. I will highlight the approach and findings of the three sub-studies on organisation, personnel, and culture first.

The theoretical basis of the organisational analysis was rather opaque:

The starting point... is the assumption that ICUs can, from the point of view of organisational analysis, be considered as uncertainty reducing units (van Rossum 1998: 153).

It was not stated why this particular viewpoint was adopted, although, as I mentioned in chapter one, 'structural contingency theory', the "dominant paradigm" in organisational studies, regards 'uncertainty' as a key variable to be explained (Donaldson 1999[1996]). Even so, as van Rossum in fact noted, a theorem within 'structural contingency theory'



is that increased technology is one means whereby organisations reduce uncertainty (Thompson 1967). However, for ICUs the reverse is the case: an increase in medical technology is likely to mean that a greater variety of conditions can be treated, which may *increase* the ‘uncertainty’. It is disappointing that no attempt seems to have been made to analyse the ‘deviant case’ of ICU further in this regard.

Nevertheless, uncertainty was operationalised in several ways: the number of patients to be treated related to their length of stay in ICU; the occupancy rate; the length of stay; and the proportion planned, scheduled and suddenly deteriorating admissions (obtained by surveying the physicians).

With respect to ‘low risk’ patients there were three findings: the degrees of task differentiation and centralised decision-making were both negatively associated with the medical performance of the ICU, and the level of work standardisation was positively associated with medical performance. Notably, the level of nurse qualifications was not related to ‘medical performance’. No associations were found for high risk patients. The authors concluded that a “team-like structure” (*i.e.* low task differentiation and low centralisation) was associated with a better clinical performance.

The Personnel sub-study (Schaufeli and Le Blanc 1998) consisted of an analysis of the job of intensive care nursing, including staff characteristics, job-related stress and risk factors for burn-out. A model was constructed on the relationship between ICU nurses’ workload (input), their job-related stress (throughput) and the performance of the ICU (output). Results were aggregated to ICU level and both subjective measures (from a ‘well-being at work’ questionnaire) and an ‘objective’ measure (Nine Equivalents of Manpower Use Score (NEMS) – Reis Miranda *et al.* 1997) were used. Using principal component analysis from the ‘well-being at work’ questionnaire, the investigators derived human resource outcomes of ‘morale’, personal accomplishment, perceived unit performance, job involvement and organisational commitment. The objective measures (NEMS, CMA hospital mortality) were non-significantly associated with subjective measures (perceived workload, perceived performance). The main result was that high objective workload correlated with emotional exhaustion.

The Culture sub-study investigators adopted a somewhat controversial perspective that “unless one is able to measure it, studying and talking about organisational culture has



no meaning” (Sanders and van der Veen 1998: 209), although I suspect that this is in deliberate opposition to the management literature on organisational culture rather than, say, the anthropological literature. That said, their operationalisation of culture into ‘practices’ (visible) and ‘values’ (unconscious, non-discussable, non-observable) did enable some measurements to be made via written questionnaires and some interesting findings emerged.

Of six dimensions of organisational practices investigated, three were found to vary among ICUs and three did not. The ‘practice dimensions’ which were found to vary among ICUs were: process-oriented versus results-oriented (whether there is a concern for means or goals); employee-oriented versus job-oriented culture (e.g. whether people feel their own situation or the job is important); and open system versus closed system (whether the work unit is or is not welcoming to newcomers). The three practice dimensions which were found not to vary among ICUs were: parochial versus professional (whether the primary identification is local organisation (parochial) or profession); loose control versus tight control (degree of monitoring); and pragmatic versus normative (degree of ‘customer focus’). Three dimensions of values, identified in the same earlier study, were elucidated as: need for security (living in clear, well-defined circumstances); centrality of work; and need for authority. Among these, only the ‘need for security’ was found to vary amongst ICUs.

No significant association was found between ‘medical performance’ (CMA hospital mortality) and culture when taking the whole study data. However, this was attributed to the very large variation between countries. When disaggregated into ‘countries’ (although note that ICUs were not representative of the ‘country’ and the average sample size for each country was less than seven ICUs), analysis of covariance revealed a significant association between the results-process-oriented dimension and ‘country’ taken together and CMA hospital outcome. This seems to represent a weak argument against standardising work processes through protocols. (There may, though, be some specifying factors: the organisation sub-study reported that greater ‘work standardisation’ was associated with better outcomes for ‘low risk’ patients). No significant correlations were found between the results-process-oriented dimension of culture and the other organisational characteristics which were measured.

Finally, medical performance was tested as an dependent variable against ten



independent variables, two from each sub-study, plus the variable ‘country’. Following a multiple regression analysis, the following variables were found to be statistically significantly associated with CMA hospital outcome: ‘country’; number of beds (nine optimum); organizational commitment; results-oriented culture; and “elementary organisational framework” (a composite measure encompassing written job descriptions, regular staff meetings about both clinical and non-clinical issues, existence of formally written protocols to guide care activities and regular evaluation of staff). Disentangling these different factors is a major aim of a follow-up study, EURICUS-II (Nap *et al.* 2000).

### Key findings of other organisational studies

Previously published work (Carmel and Rowan 2001) reviewed fifty-four published studies on organisational factors in ICU and patient outcome. As with any review of the literature on evaluative research, there were several sources of potential bias (for example, reporting, publication, and English language bias). There were, in addition, particular problems with this particular review, which I will highlight before commenting on the findings reported in the review itself.

No formal attempt was made to assess the methodological quality of the studies. However, even when seen in combination, the results should be seen as indicative of trends and associations rather than explanatory or causal. This is because of several more sources of bias, apart from the biases mentioned above. First, in some studies of organisational interventions, several changes were made at the same time, making it difficult to disentangle putative causes of beneficial effects. Second, as the organisational studies were often observational, it is difficult to account for the possibility of confounding or of secular trends. Third, many single-centre organisational studies appeared to be run by enthusiasts or advocates of a particular organisational strategy.

Based on the studies retrieved, categories of ‘organisational factors’ were derived. A further possible problem (and one reason why the combined results should be seen as only indicative) is that there may have been





differential retrieval of the published evidence according to the different categories, with the evidence in some categories being more nearly complete than in others. (Carmel and Rowan 2001: 293)

Finally, there was some indication that some areas, studied in greater detail, were those where “it was easier to quantify or categorise the organisational factor” (*ibid.*: 290). The categories should therefore certainly not be regarded as prescriptive of the kinds of things which could be identified in an ethnographically-oriented piece of work. I now turn to the findings themselves, which are discussed in terms of nine categories previously derived from the empirical literature: management and personnel issues; medical staffing; nursing staffing; teamwork; volume and pressure of work; protocols; technology; structure; and error. After presenting these findings I comment on ways in which ethnographic research methods might be a more fruitful approach, and subsequently review ethnographic studies in acute care settings.

With regard to management and personnel issues, while the APACHE III and EURICUS-I studies found few associations between employee- or job-centred culture, nurse burnout, level of job security, level of staff turnover or level of caregiver interaction and CMA patient outcome, EURICUS-I and one other study did find an association between CMA hospital outcome and having standardised procedures and protocols for management and personnel, admission, evaluation of staff (Kern and Cox 1999, Reis Miranda *et al.* 1998). This is one important facet of the deployment of protocols in intensive care, and I report on treatment protocols shortly.

Medical staffing has been investigated quite widely. A number of North American studies have shown that where an ICU was led by a doctor trained in critical care there were better outcomes. This is important in terms of the current policy endeavours in the UK, where medical management in ICUs is currently categorised as either ‘closed’ or ‘open’. Closed units are where the responsibility for clinical management of patients is transferred from a referring consultant. Open units are where patients remain under the care of the referring consultant and the ICU doctor’s role is considered to be an advisory one. The balance of evidence seems to indicate that “closed” ICU management structures have better outcomes than “open” ones (Li *et al.* 1984, Reynolds *et al.* 1988, Pollack *et al.* 1988, Brown and Sullivan 1989, Rowan 1992, Pollack *et al.* 1994, Marini *et al.* 1995, Carson *et al.* 1996, Multz *et al.* 1998, Ghorra *et al.* 1999), although no



association was reported in three studies (Teres *et al.* 1983, Tai *et al.* 1998, Hanson *et al.* 1999).

The data from these studies on closed and open units have been combined in a systematic review and meta-analysis by Pronovost and colleagues (2002), who divided the earlier findings into low- and high- intensity of ICU physician staffing. They reported a statistically significant reduction in the risk of hospital mortality associated with “high-intensity staffing”, and commented:

A conceptual model explaining these findings is that physicians who have the skills to treat critically ill patients and who are immediately available to detect problems and institute therapies will prevent or attenuate morbidity and mortality (Pronovost and colleagues, 2002: 2151).

I return to this explanation, in the light of my findings, in chapter nine. But it is also notable that the Audit Commission (1999), having identified that 80% of UK units were ‘closed’ (*ibid.*: 35), did not report evaluative findings on closed versus open units. A secondary analysis of their data on this matter, related to outcome, would provide more robust evidence than a systematic review of studies with all the potential biases identified above. Having said that, Pronovost and colleagues’ meta-analysis also reported improvements in *efficiency* of ICUs (in terms of reduction in length of ICU stay) – an aspect of organisational performance which was neglected in Carmel and Rowan’s (2001) synthesis.

The provision, and by whom, of out-of-hours medical cover could also be an important issue. ICU-trained doctors are reckoned to improve outcome (Rafkin and Hoyt 1996, Tenner *et al.* 1999, Blunt and Burchett 2000), as is dedicated consultant out-of-hours cover (Rowan 1992). Pronovost and colleagues (1999), in a retrospective observational study on 46 hospitals (2987 patients undergoing abdominal aortic surgery), found that not having a daily round by an ICU-physician was associated with a three-fold increase in in-hospital mortality.

Associations between the pattern of medical working and outcome have been found. The Audit Commission (1999) reported better outcome associated with week-on/weeks-off consultant cover rather than same session each week. Rosenfeld and colleagues (1999) reported improved outcome with access to remote intensivist. Increasing the number of doctors has also been shown to improve patient outcome (Pezzi *et al.* 1997,



Barnett *et al.* 2000) – however the Audit Commission (1999) found no association with level of medical staffing nor skill mix, and Kelley and colleagues (1990) found no difference in outcome following an increase in the number of ICU dedicated doctors.

The actual presence on the ICU of senior medical staff may also make a difference. Manthous and colleagues (1997) found an improvement in outcome upon the introduction of a full-time critical care director. Mallick and colleagues (1995), in a secondary analysis of a census of critical care units in the US, found that the presence of a “working” medical director (that is, one who is fully involved in the working of the ICU) led to increases in the efficiency of the ICU (there were no data for patient outcome). Li and colleagues (1984) found an improvement in outcome with on-site physicians, but Teres and colleagues (1983) found no difference.

The effect of nurse staffing on patient outcome appears to have been investigated less and produced very little in terms of a detectable relationship. One positive finding was Reis Miranda and colleague’s (1998) association between improved outcome and higher levels of nursing autonomy. No associations have been found between level of nurse qualifications, skill mix, staffing ratios and CMA outcome (Solsona *et al.* 1993, Shortell *et al.* 1994, Bastos *et al.* 1996, Reis Miranda *et al.* 1998, Audit Commission 1999). One might presume that the total nursing requirement for a unit is in any case in some kind of dynamic equilibrium with the number and severity of the patients admitted.

The evidence concerning teamwork, for example the impact of collaborative practice, on patient outcomes following ICU is mixed. A recent prospective, randomised, multi-centre and multi-national study, currently reported only as a conference abstract, found that protocols introducing collaborative practice had a significant and beneficial effect upon clinical outcomes in the ICU (Nap *et al.* 2000). However, a number of earlier observational studies found no impact on outcome of collaboration (Pollack *et al.* 1994, Shortell *et al.* 1994, Mitchell *et al.* 1996, Mitchell and Kussy 2000). Baggs and colleagues (1992, 1999) investigated nurse-physician collaboration over discharge from ICU in three units by means of a survey instrument. They found that nurses’ reports of nurse-physician collaboration on decisions about unit discharge was associated with patient outcome for a medical ICU. This is in contrast to doctors’ reports of those interactions, and nurses’ reports of interactions in a surgical ICU and a general ICU, which were not associated with patient outcome. In a study of thirteen ICUs, Knaus and



colleagues (1986, Draper 1987) reported improved outcome with higher levels of collaboration, although this widely cited 'finding' was a *post hoc* explanation.

The evidence on volume and pressure of work is slightly less equivocal. Workload has been operationalised variously as admissions per year, per month, per week or per day; daily nurse-patient ratios; and the level of nursing requirement at discharge. Several studies have reported a positive relationship between increased workload and worse outcomes (Reis Miranda *et al.* 1998; Smith *et al.* 1999, Barnett *et al.* 2000, Goldfrad and Rowan 2000a, 2000b, Tarnow-Mordi *et al.* 2000, Tilford *et al.* 2000). These fairly recent findings contrast with two earlier studies (Pollack *et al.* 1994, Jones and Rowan 1995) which both found no association.

One aspect of the volume and pressure of work is the diversity of tasks performed, and 'task diversity' has been operationalised as the level of diagnostic diversity (*i.e.* the variability of admitting diagnoses). This has been measured in several studies (Shortell *et al.* 1994, Bastos *et al.* 1996, Mitchell *et al.* 1996), with only the APACHE III study reporting an association with patient outcome. These studies were conducted when there was much policy-related discussion about 'volume and outcome' and the possible meaning of a relationship between them (for example that specialised surgical units might have better outcomes). Other HSR studies, using more sophisticated CMA methods, subsequently detected less of an effect (Sheldon 2000), which may have contributed to the disappearance of this issue from future research and policy discussions.

There is very mixed evidence regarding the adoption of protocols. Most studies have reported no difference in patient outcome with the introduction of protocols relating to the processes of care (D. Roberts *et al.* 1993, Mitchell *et al.* 1996, Kollef *et al.* 1997, Pilon *et al.* 1997, M. Young *et al.* 1998, Marx *et al.* 1999), although some of these studies and others have reported a reduction in costs with the introduction of such protocols (Kollef *et al.* 1997, McAlpine *et al.* 1997, Mehari *et al.* 1997, Pilon *et al.* 1997, Kern and Kox 1999). Rowan (1992) even found improved outcome was associated with a *lower* reported level of protocol use. Where the introduction of protocols has been associated with a beneficial effect on patient outcome, several different types of protocol, including personnel issues as well as patient care issues have been introduced at the same time (Reis Miranda *et al.* 1998, Kern and Kox 1999, Nap *et*



*al.* 2000). It seems that written policies and procedures relating to personnel policies and collaboration might have a positive measurable impact on patient outcome, whereas protocols relating to processes of care have at best a minimal impact and may even be harmful. This ties in not only with the findings on teamwork and collaboration but also with some of Reis Miranda and colleagues' (1998) findings on organisational culture (that a results-oriented, as opposed to process-oriented, culture was positively associated with patient outcome).

Intensive care is a high technology area. Two studies have found that the presence in the ICU of "available, recommended technology" is associated positively with patient outcome (Shortell *et al.* 1994, Bastos *et al.* 1996). In some cases low technology care might be considered more humane, and Rudy and colleagues (Daly *et al.* 1991, Rudy *et al.* 1995) found no difference in outcome when "chronically critically ill" patients were managed in a low technology area. Mitchell and colleagues (1996) reported no association with level of perceived technology. Siegel and colleagues (1980) reported that the introduction of a computer-based system improved outcome over an eight-year period. More recently, Rosenfeld and colleagues (1999) reported improved outcome with telemedicine access to a remote intensivist.

Several studies have investigated 'organisational structure', such as size of ICU and the teaching status of the hospital in which the ICU is located. Reis Miranda and colleagues (1998) found that optimal outcome was associated with nine beds, but Pollack and colleagues (1994) found no association between outcome and the number of ICU beds for paediatric units. In the same paper Pollack and colleagues reported an association between teaching status and patient outcome, with non-teaching hospitals faring better. On the other hand, Knaus and colleagues (1986) reported no association between teaching status and patient outcome. Similarly, Bach and colleagues (1998) reported no difference between non-university and university based intensivist teams.

A recent innovation in the organisation of critical care has been the introduction of high dependency units (HDUs). These are sometimes referred to as "step-down units", as they provide higher level care than on the ward and are often the unit to which ICU patients are discharged when they are deemed to no longer need intensive care.

Apostolakos and colleagues (1999) investigated the introduction of a respiratory step-down unit in their hospital – this made no difference to CMA outcome. Other studies



on HDUs have been conducted which have not measured outcome. Dhond and colleagues (1998) observed the effect of opening an HDU adjacent to the ICU, and found that there was little impact on the workload of the ICU. Edwards and Stockwell (1996) observed that the provision of high dependency beds may increase the severity of illness of patients admitted to the ICU.

Several studies have focussed on medical error. McQuillan and colleagues (1998) reportedly found that 'suboptimal' prior general ward care affected outcome following intensive care. A detailed reading of their paper reveals that this over-interprets their results; an alternative interpretation is that intensive care acted as a "buffer" (*cf* Mitchell *et al.* 1996: 362) between poor care in the hospital and poor outcomes. Similarly, McGloin and colleagues (1999) reported a significant difference in ICU and hospital mortality between patients deemed to have received 'suboptimal' prior ward care and those who had received adequate care. Giraud and colleagues (1993) recorded the level of iatrogenic complications for admissions to intensive care for two ICUs. They found no associations with outcomes for all admissions, although there was an association for admissions staying more than twenty-four hours.

Studies which have not found a relationship between errors and patient outcome would seem to support the notion that the effect of medication errors, while serious, may not be detectable at the level of ICU in terms of patient outcome. Sexton and colleagues (2003) conducted an empirical test of a human factors engineering approach, analysing attitudes of ICU staff towards teamwork and safety. They found wide variation in staff attitudes towards teamwork and safety, but negative attitudes were not associated with 'poorer, risk adjusted patient outcomes'. Several prospective observational and anonymised critical incident analysis studies have described the pattern of errors in ICU. Girotti and colleagues (1987) found that medication errors happened at times that the ICU was busiest (during the daytime); Wright and colleagues (1991) reported that 80% of errors were 'human error'. Beckmann and colleagues (1998) performed a search of narrative keywords and contributing factors on an anonymous, voluntary database of 'incidents', which identified that nursing staff shortages were associated with incidents. The consequences of these incidents appear not to have resulted in measurable differences in patient outcome. That errors are bad is common sense. What is possibly indicated by these studies is that staff can cover the 'gaps' in patient care,



and perhaps experienced staff do act as buffers for poor organisational attributes and compensate for and recover from errors.

## Summary

I would like to make three comments by way of summary and conclusion to this section on quantitative studies of ICU organisation. These comments point to ethnography as the method of choice for this thesis.

First, there is some, albeit limited, evidence that particular organisational structures and patterns of working are more effective than others, although firm implications are difficult to identify given the variable methodological quality of studies undertaken. Medical leadership by a doctor trained in intensive care and resident senior medical staff have been persistently associated with improved patient outcome. A 'closed' ICU appears to be more effective than an 'open' ICU. On the other hand, nursing skill mix has not had a demonstrable impact on patient outcome adjusted for case mix, whilst attempts to measure teamwork or collaboration have found, at most, a marginal impact on patient outcomes. A general comment, however, is that whether or not associations are well established in terms of empirical findings, identifying the mechanisms of such associations is something which ethnography could achieve.

Second, there are issues around measurement of both 'outcomes' and 'factors'. Patient outcome, even where adjusted for case-mix, may not be a sensitive enough measure to identify important organisational factors. For example, Pollack and colleagues (1999) investigated perceptions of 'good managerial practice' in neonatal ICUs, and found that that mortality was not associated with these perceptions whereas several measures of morbidity were. There also seems to have been more research on easily measurable organisational factors, rather than non-measurable ones, identifiable in ethnographic research, which may have more theoretical power or practical use.

Third, organisational performance needs to be examined in more ways than just patient outcome. Some organisational interventions might affect efficiency or humanity or equity of care rather than its effectiveness. As the ICU is embedded within a 'network of acute care', a 'clinically effective' (in terms of patient outcome) but *inefficient* ICU



could reduce the effectiveness of other, organisationally linked, subunits. There is a lack of theoretical underpinning to evaluative research, which is highlighted by the lack of conceptualisation and representation of the ICU both as an organisational sub-unit and as a work-unit in its own right. Unfortunately, even where there has been a firm theoretical underpinning to specifically organisational studies, the justification for the adoption of a particular conception has been questionable.

Such qualitative observational research that has been done so far in this area has been of an illustrative, shedding-light, ‘vignette’ variety. A detailed observational study should, in principle, be able to provide an empirical basis for characterising and conceptualising adequately the work and organisation of ICUs. The potential for observational research is illustrated by earlier ethnographies of acute care within the traditions of medical sociology, and the next section briefly reviews key work in these traditions.

### **Ethnographic studies of acute health care**

Medical sociology has existed as a recognisable sub-discipline of sociology, at least in the USA, for around half a century (Straus 1957, 1999). Early medical ethnographies concentrated on medical training and socialisation (R. Fox 1979[1957], Becker *et al.* 1992[1961]) and psychiatric institutions (Goffman 1968[1961], Strauss *et al.* 1963, 1974[1964]). The latter focus perhaps reflected a perceived epistemological link at that time between sociology and social psychology (Roth 1963) or psychotherapy (Parsons 1951) – a link which seems quite anomalous today.

Bloor (2001:177) commented that both Goffman’s (1968[1961]) *Asylums* and Becker and colleagues’ (1992[1961]) *Boys in White* have a “fame and influence far beyond the boundaries of medical sociology”. In part this may be because hospitals (and associated medical schools) were among the earliest institutions to open their doors to sociologists doing organisational ethnography. Freidson (1963) identified several reasons for this. First, even when ‘for-profit’, they are still responsible to the state, and morally “part of the public domain”. Second,

they are generally identified with the universalism of science [therefore] they cannot easily excuse themselves from study by reference to competitive trade secrets. (Freidson 1963: ix)



Third, having “ameliorative aims”, they might see social scientific research as a means of self-improvement.

Strauss was evidently a major beneficiary of the willingness of hospitals to open up to outside academic study, engaging in ethnographic work in medical institutions over several decades. One of his early studies (following *Boys in White*) was of two psychiatric hospitals (Strauss *et al.* 1963, 1974[1964]). He and his colleagues (1963) advocated the study of hospitals as a ‘negotiated order’ (as discussed in chapter one), stemming from a symbolic interactionist tradition. Bloor (2001) highlighted that the early American ethnographies tended to be in this tradition, and he commented that symbolic interactionist *theory* was often more of an influence than ethnographic *methods* (I discuss symbolic interactionism as a theoretical approach further in chapter three). In addition, Strauss and colleagues (1974[1964]) engaged in an empirical critique of psychiatric ideologies. Perhaps understandably, this can be taken as criticism by research ‘subjects’, especially if, as in the case of Rosenhan’s (1973) paper, the ethical basis of a study is controversial. Rosenhan, a professor of psychology, along with seven others, engaged in covert participant-observation, posing as “pseudopatients”. His findings highlighted the powerlessness and depersonalisation experienced by psychiatric inmates, but perhaps at some cost in view of the criticisms by psychiatrists of the research methods (Fleischman *et al.* 1973).

Less controversial in terms of method, but perhaps just as critical in terms of some of his findings, were Roth’s examinations of tuberculosis clinics (1957, 1963) and hospital emergency departments (1974[1972]). In tuberculosis clinics he identified and examined the difficulties staff faced in obtaining information from patients. He commented:

A normative approach is likely to miss what is intrinsic to a situation. Labelling staff members incompetent or lazy when they fail to obtain [useful] information... overlooks the built-in effects of the organization of the treatment setting (Roth 1963:316)

Roth had also posited that organisational status, rather than scientific knowledge, was the key explanation of who wore protective clothing and when. He termed the way that patients only sometimes needed to wear protective clothing as “institutional magic”. In his work on emergency departments he followed in the tradition of *Boys in White* and questioned the idea that medical treatment was morally neutral. Roth’s work shows



how ethnographies in medical settings have often been critical of either medical practitioners or medical “science”.

Jeffery (1979), like Roth, demonstrated how A&E staff morally categorise patients. His schema, “good patients” and “normal rubbish”, was later extended by Dingwall and Murray (1983) to include ‘children’ (who fell into neither category). A British medical sociological concentration on doctor-patient relationships and interactions is perhaps best exemplified by Strong’s (1979a) analysis of the “bureaucratic format” of medical consultations. Strong argued that this format originated from a combination of ‘medical dominance’ and ‘medical gentility’, and represented the “victory of bourgeois medicine” (Strong 1979a: 216-20). Silverman (1990[1984]) expanded on Strong’s work, and, in comparing NHS and private oncology consultations, highlighted an increasingly common element of ethnography in medical settings – the method of comparison. Through researching both settings he was able to identify the differences between the formats of private and NHS consultations. He found, for example, that in private consultations the doctor-patient relationship was more ‘equal’ – private patients more often took the initiative in the consultation, could move around the consulting room more, and seemed to take more responsibility for their treatment.

The concentration on ‘doctor-patient interaction’, has latterly been criticised (Berg 1992, Casper and Berg 1995). To some extent the concerns seem justified: Strong (1979a: ix), for example, introducing his monograph on interactions in children’s outpatient clinics, wrote:

[This book] says nothing about the medicine involved.

However, I want to question whether critics such as Casper and Berg have exaggerated medical sociology’s “neglect” of “the heart of medicine” (Berg 1992). As counter-examples, there are health care ethnographies from the 1970s and 1980s which did not take ‘doctor-patient interaction’ as their primary topic of analysis. Bloor’s (1976) paper, while reporting on doctor-patient interactions, was primarily an analysis of the decision rules and “disposal” of patients by different practitioners (in his case, ENT specialists assessing children for possible adeno-tonsillectomy). Two more acute care ethnographies from the late 1970s further illustrate that the topics addressed by medical sociologists were more varied.



Bosk's (1979) ethnography of surgeons identified four classifications of error and two sets of responses to them. Failures of techniques (which he termed technical or judgemental failure) were responded to by senior surgeons with much less seriousness than moral failures (which he termed normative or quasi-normative). Thus in the social context of surgery, 'technical performance' was subordinated to 'moral performance' (Bosk 1979: 168), giving support to the view that doctors perceive their work as moral first and foremost.

Bosk's study also demonstrated the possible benefits of introducing a comparative element to ethnographic sampling. He had assumed that because of

different leadership styles [and] different... services I would have a natural comparison of the ways errors were detected, coded, and redressed... However, no interactionally significant differences emerged. (*ibid.*: 13)

That is, finding 'no differences' between teams which were assumed to be different was analytically important, since it increased the likelihood that his findings were generalisable.

Around the same time, D. Hughes' doctoral study also shifted focus onto *intra*-clinical relationships and decision-making. His ethnographic study of a casualty (A&E) department (1980, 1988) found that nurses' work in the processes of patient categorisation moved close to the medical tasks of diagnosis and treatment. This theme was later taken up by Allen (1997), who identified ways that nurses organised activities which were officially medical (for example the prescription of drugs), even though they formally asserted their separate jurisdiction ("*de facto* boundary-blurring" – Allen 1997: 511). Allen added rich data which enabled the notion of "interplay" between doctors and nurses as a "negotiated order" (Svensson 1996) to be properly scrutinised. She expanded the concept to include nurses' 'negotiations' and drawing of boundaries not just with doctors but also with other classes of health care workers (*e.g.* managers, health care assistants) and patients (Allen 2002[2000], 2001b).

Whereas early British acute care ethnographies had tended to be based in A&E or outpatient clinics, two studies in the 1990s took medical sociology further into the hospital. N. Fox (1993, 1994) examined the work of operating theatres and highlighted the differences between anaesthetists' and surgeons' views of the body. He



demonstrated how tensions in the operating theatre arise out of fundamentally different conceptualisations of a surgical operation:

An operation represents, for the surgeon, the *desirable reduction in Illness* of a patient. For the anaesthetist it represents the *undesirable reduction in Fitness*. In any surgical procedure there will be a trade-off between reduction in Illness and reduction in Fitness. (N. Fox 1994: 10, emphases in original)

In explaining the paradoxical ‘the operation was a success but the patient died’, Fox highlighted a subtle differentiation between medical specialities, rather than a crude characterisation of a ‘biomedical worldview’.

Atkinson (1995) also noted that medicine was a very differentiated profession. In an argument parallel to that of Casper and Berg (1995), he suggested that medical sociology’s preoccupation with doctor-patient interactions had been partly due to its concern with the ‘social’, as opposed to the ‘natural’ of biomedicine (Atkinson 1995: 31ff). This, Atkinson argued, had hampered the development of a ‘sociology of medical knowledge’. His own ethnography of the hospital specialty of haematology attempted to develop just this. In doing so, he used detailed empirical data on doctor-doctor interaction to demonstrate how the “production of medical knowledge” was embedded in the shared “liturgy of the clinic”. Which is to say, the socially shared environment of medical work is organised around the talk of medical practitioners. Atkinson’s tape-recorded data enabled this fine-grained analysis. My own results address some similar concerns (e.g. medical knowledge and embodiment), although at a different level of analysis, with less emphasis on recordable *talk* and more emphasis on observable *practice*.

The most comprehensive, methodologically “sumptuous” (Green 1998: 2145) sociological study of hospital organization must be that conducted by Strauss and colleagues (1997[1985]). They put *work* at the analytic centre of their research, and brought several analytic devices to bear on the understanding of work in hospitals. The first was the characterisation of hospitals as collections of multiple, differentiated, worksites: “variegated workshops”. Another was the conception of periods of chronic illness as “trajectories”. The period of the trajectory in hospital, regarded as an acute period, involves many different kinds of work. Strauss and colleagues categorised and analysed several types of work, including: error work; information work (including written work which they claimed was often down-played by sociologists as being ‘self-serving’); body work (that is, whether clients are regarded as ‘objects’ or ‘participants’);



teamwork and machine work. The theme of 'body work' recurred throughout their text, and Strauss and colleagues devoted a chapter of detailed empirical analysis to 'machine work'. (In typical fashion, they presented a "partial list" of the different properties of "medical machines" (*ibid.*: 43-4) – a list which ran to no fewer than thirty-six items). Such a focus on 'machines' and 'bodies' was apparent in an earlier paper (Weiner *et al.* 1979), where they had analysed the high technology site of the intensive care nursery in terms of the "biographies" of the ward, machines, medical specialty, hospital, staff and infant. Such attention to the material nature of a medical care setting perhaps demonstrates how the accusation that medical sociology has exclusively focused on the 'social' (Berg 1992, Casper and Berg 1995, Atkinson 1995) has been overstated.

From an organisational perspective it is Strauss and colleagues' observations regarding 'articulation work' which are most pertinent. They commented that there are inherent difficulties in rationalising and bureaucratising "medical production". Compared with industrial production, for example, fewer aspects of medical work are rationalisable. In particular, illness trajectories are disruptive; there is an interaction between different kinds of work; the competition for different kinds of resource is complex; and even on specialised wards the patients are at different stages of their respective trajectories. All this means that articulation and co-ordination work by health care providers requires a great deal of effort, which Strauss and colleagues related back to his earlier work on 'negotiated order'.

It is perhaps not surprising, given the amount of his working life that Strauss spent in hospitals, that he and colleagues were among the first to conduct sociological research on intensive care (Strauss *et al.* 1997[1985]: 227-37). This particular analysis of ICU, however, was not concerned with the substantive themes of the rest of the monograph (workshops, trajectories and categories of work). Rather, the historical evolution of ICU was used to illustrate a rather laboured argument that the relationship between local organisational forms and societal structures (and micro-macro relationships in general), are reciprocal and complicated.

Following Strauss and colleagues' study of the intensive care nursery (Wiener *et al.* 1979), two further sociological analyses of this locale were undertaken in the 1980s (Guillemin and Holmstrom 1986, Anspach 1987). For both, an element of comparison was introduced into the sampling of sites for analysis. Guillemin and Holmstrom



broadened out their research on a major referral centre to include fourteen sites elsewhere in the USA and in Europe. With children (and perhaps especially with neonates) the relationship between patients' relatives and clinical staff is evidently an important topic for analysis. This is an area which, based on my findings in chapter seven, I think has possibly been neglected for adult intensive care, but could be an interesting direction for future research. Because of the high nursing presence and involvement in neonatal ICUs, both these studies also analysed the role of nurses and, in Anspach's case, nursing's relationship with medicine.

British medical sociology also broadened its critical gaze from *doctor-patient* interaction to interactions between patients and other health care workers (May 1992). This perhaps reflected the move of nursing into higher education, and pressure on British nursing academics from their American counterparts during the 1980s to develop nursing theory, nursing science and nursing 'models' (Traynor 1999: 67-73). For the particular case of ICU, nurses and ex-nurses have been active in producing social scientific research, although sociologists and sociology-minded nurses have tended to 'use' ICU as a vehicle to investigate topics other than the ICU itself. For example, Zussman (1992), D. Cook and colleagues (1999) and Melia (2001) all used the ICU as the site of investigation for ethical issues, especially concerning withdrawing or withholding treatment. Harvey (1992, 1995, 1996, 1997) and Porter (1991, 1992b, 1993), adopting critical perspectives, used ICU to investigate power relations in individual and ideological terms. Groen's (1995) thesis, an ethnographic study of technology, work and organisation in eight Dutch ICUs, demonstrated considerable affinity in analytic interests with my own, although her research was concerned exclusively with the interaction between these topics and nursing processes. More recently, the relationship between ICU and palliative care has been investigated by Asch and colleagues (1997), Seymour (2000), and Happ (2000). These varied studies show how intensive care can be analysed from many perspectives, and can provide a rich resource on inter-related issues.

Harvey's (1992, 1995, 1996, 1997) and Zussman's (1992) studies are the major sociological and ethnographic studies of ICU, although Harvey presented little observational data in her analyses (utilising mainly interview data). As with Guillemin and Holmstrom's (1986) and Anspach's (1987) research on neonatal ICUs, both studies had an element of comparative analysis. Harvey juxtaposed data from ICU with data



from maternity wards and Zussman conducted research on ICUs in two different hospitals – one in a suburban location and the other in a city centre teaching hospital. Harvey’s and Zussman’s findings feature most strongly in my analysis, although relevant findings from all aforementioned studies are discussed at appropriate moments in my results chapters.

As this thesis is an analysis of ICU as an organisational unit and place of work, it does not specifically address patients’ experiences. I should, though, pay tribute to three recent but contrasting sociological accounts of the experience of being a patient in intensive care. Robillard (1999: 48-63), an ethnomethodologist, reported on the communication difficulties he experienced during an acute phase of his illness with motor neurone disease (he spent around three months in ICU in Hawaii). Robillard was critical of the nursing staff who asked him to be a “good boy” (*ibid.*: 35-9). In his frustration in pursuing what this actually meant, he was eventually reduced to sarcasm: “Is being a ‘good boy’ leaving you free to eat doughnuts?” (*ibid.*: 36). In part, the problematic relationship was related to a cultural gap with the “flying nurses” over from the US mainland on short-term contracts (*ibid.*: 53-6). But more generally, Robillard pointed out that Parson’s argument, that the ‘sick role’ entailed being exempt from responsibility, was at odds with the nurses’ talk:

What does it mean to be a ‘good boy’? It means to be a patient who does not express symptoms requiring the attention of a nurses. Such reasoning trades on an assumption that patients have some motivational control of their symptoms, or at least should have. (Robillard 1999: 36)

As Rier (2000: 69) later noted, Robillard’s experience in particular being conscious and retaining his mental faculties throughout his stay in ICU, made “his experience of critical illness a highly atypical one.” Rier’s own “inadvertent ethnography” took a rather different approach to analysing his own stay in an ICU in Israel. He was unable to communicate verbally for long periods and so used a notebook. Later he was able to analyse his own notes and piece together aspects of his own period in ICU. Contrary to Robillard, and indeed contrary to his own earlier teaching of medical sociology, he argued that the post-Parsonian critique of the “sick role” was inappropriate for critical care patients, for whom

full disclosure of information... [and] collaboration with physicians are of minimal relevance. (Rier 2000: 68).

Rier’s experience of nursing staff also rather contrasted with Robillard’s viewpoint:



According to both my own recollections and those of my wife, the staff were consistently patient and kind, as well as cheerful. Both doctors and (especially) nurses took great pains to preserve my ‘personhood’, which task, one nurse later explicitly informed me, they considered part of their job. (Rier, 2000:78-9).

The evident discrepancy between Rier’s and Robillard’s experiences and interpretation is fascinating. These differences were neither noted nor explored by Rier, who stated that Robillard “interpreted his experience via postmodernism” (2000: 69) – although Robillard (1999:63) explicitly rejected a postmodernist interpretation of his experiences. Differences in local and national cultures could constitute a partial explanation. The very different viewpoints put forward by Rier and Robillard highlight the traditional difficulty in ethnography (whether autobiographical or not) of ideographic description.

Richman (2000: 98), like Rier, commented that he had to revise his medical sociology teaching following a seven-week period in ICU (in Manchester). He was unconscious for most of this period, and his paper was concerned with an analysis of the vivid and bizarre dreams he had had while in intensive care and the “intensive care syndrome” he experienced as he began his recovery. Intensive care syndrome is shorthand for a group of deliriums experienced by patients after intensive care (Richman commented that he “displayed psychotic and paranoid symptoms”, *ibid.*: 87). Richman’s literature review on the subject identified that intensive care syndrome is not monocausal, but has a number of contributory factors including the after-effects of anaesthetics, the “organic effects of surgery” and the noise and alien appearance of ICU. Richman also suggested that patients in ICU often miss proper sleep due to the activity in the unit.

The latter three accounts of ICU, combining as they do sociologists’ knowledge with experiences as patients, and published over the course of this research project, provided a timely admonition that patients (and their relatives) needing care are at the heart of intensive care work (or should be). This obviously remains the case even where the focus of analysis is on ICU as an organisational unit and place of routine work.

## Summary

Analyses of the organisation of ICU have taken largely evaluative, quantitative approaches. There is a danger that ICUs have been conceptualised rather rationalistically, and those aspects of ICU which have been evaluated are those which



have been easiest to measure. Where there has been a conceptual basis to organisational analysis, this has largely followed a normative approach derived from a health care quality agenda.

Qualitative and ethnographic research in other acute areas has demonstrated non-rationalistic and non-measurable aspects of work, organisations and knowledge in hospitals. It has often highlighted the situated practice in health care settings. Such research has sometimes taken an overtly ‘critical’ approach, but this is not fundamental to ethnography. Indeed, a constructively critical ethnographic approach could, in principle, identify less easily measurable factors which affect ‘organisational performance’.

A trend identified in acute care ethnographies is an increasing visibility of a formal comparative component to either analysis or sampling. This contrasts with a traditional ethnographic aim of ‘ideographic’ description, but could add weight to findings (even if the comparison only demonstrates similarities between different locales). I discuss this methodological issue, along with theoretical perspectives on ethnographic research and practical problems I encountered, in the following chapter.



## Chapter Three

### Methodology

In this chapter I report on the methodology of this study. Insofar as it might be appropriate to translate a natural science model of inquiry to ethnography, its most prominent feature is that the researcher is the ‘instrument’. I therefore describe the methodology of this thesis in quite personal terms. While inevitably being a *post hoc* justification of the approaches I took to data collection and analysis, I nevertheless try to give an honest account and analysis of the processes involved.

In the first section of this chapter I state the putative strengths of ethnography. Then, in ‘theory and method’ I describe how I considered several social theoretical perspectives over the course of the project, only serendipitously discovering an apposite ‘social theory’ after completing most of the analysis. In ‘generalisation and sampling’ I consider some aspects of the logic of analysis, including the issue of generalisation from ethnographic research. Then follows a short section on the mechanics of data collection and analysis, before I move on to practical and personal aspects of the research: gaining access and how I presented and managed myself.

Underlying this chapter is the theme that the primary purpose (and, perhaps, logic) of ethnography is *exploration*. While all research is exploratory to some degree, this motif is particularly salient in ethnography:

One of the defining characteristics of ethnographic research is that the investigator goes into the field... to learn about a culture from the inside out.  
(Schartzman 1993: 3-4)

Ethnographic research adds to general human knowledge, but crucially this process is facilitated through individual ethnographers gaining first-hand experience of milieus of which they had little first-hand knowledge prior to embarking on the research.



## The strengths of ethnography

The very anonymity of the interviews, though it may yield knowledge of personal contexts yet deprives the research of the possibility of relating statements to their actual industrial context; that is, to the actualities of a particular industrial situation. A final innovation of the method seeks accordingly to study the individuals of a working group simultaneously by interview and direct observation. (Mayo 1933, cited in Sofer 1973: 68)<sup>1</sup>

The most complete form of the sociological datum... is the form in which the participant observer gathers it: An observation of some social event, the events which precede and follow it, and explanations of its meaning by participants and spectators, before, during and after its occurrence. Participant observation can thus provide us with a yardstick against which to measure the completeness of data gathered in other ways, a model which can serve to let us know what orders of information escape us when we use other methods.  
(Becker and Geer 1957: 28)

The basic strength of ethnography (or participant-observation) is in the collection of observational, *in situ* data, where there is a concentration on what people do at least as much as what they say (they do). This emphasis on ‘what people *do*’ is in tune with critiques of using the interview as a stand-alone method (*e.g.* Silverman 1998). Such critiques are a return to earlier comments on social research methodology, such as those of Mayo and Becker and Geer.

Not only is it vital to include direct observations of the work *in situ*, but also, in trying to understand and interpret a workplace, it is important to try to obtain the interpretation of events by those in the working situation. Such “insider accounts” (Hammersley and Atkinson 1995), obtained in in-depth interviews or *ad hoc*, in the context of the work situation, should be neither privileged nor treated ironically (for example, by juxtaposing contrasting interview and observational data). Interview data represent an important part of the overall picture, as either resource or topic for analysis.

Mayo and Becker and Geer seem to have asserted that an ethnographic approach is the best method of social research. But to say that ethnography can make a claim to greater validity than other social research methods is not to say that there is *no* problem with validity. Hammersley’s (1992) critique of ethnography provided an important corrective to the notion that ethnography is a better method overall. However, he came close to *understating* ethnography’s strengths:

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<sup>1</sup> Sofer’s reference: Elton Mayo (1933), *The Human Problems of an Industrial Civilisation*. Boston: Harvard Business School, Division of Research, page 164.



I do not believe that there are reasonable grounds for concluding that its findings are more likely to be true in some general and invariant fashion than those of quantitative research (p.133)

But ethnography does provide a *proximity* to the activities analysed, opportunities to try to see participants' perspectives, and to collect data prospectively. The data are undoubtedly 'filtered' through the researcher, his or her own interests, preconceptions and, perhaps, prejudices. But by paying close attention to collect data at a low level of inference (Patton 1990: 239ff), they are more likely to be accurate. The traditional method of data collection (written notes) results in data that are not as accurate as, say, tape-recorded information (Seale 1999: 151ff). However, if care is taken to record data at a low level of inference, greater confidence can be placed in their accuracy. A high level of accuracy in the data can increase the level of confidence in the theoretical inferences made from them, thereby increasing the level of confidence in the validity of the study findings as a whole.

Because I endeavoured to record, in as much detail as possible, behaviours and actions as they occurred, I want to argue that they are close to 'reality', and thereby available for analysis adopting a perspective of 'subtle realism' (Hammersley 1992: chapter 3; Murphy *et al.* 1998: 69ff). The key component of this philosophical position is that:

there are phenomena independent of our claims about them, which those claims may represent more or less accurately... though... we can never be *certain* that any knowledge claim is true. (Hammersley 1992: 51, original emphasis)

Hammersley went on to say that while social research can represent reality, this is not reproducing reality ('representing in its own terms'). And although there is an assertion that there are "independent, knowable phenomena" (*ibid.*: 52),

representation must always be from some point of view which makes some features of the phenomena represented relevant and others irrelevant. Thus there can be multiple, non-contradictory and valid descriptions of the same phenomenon (*ibid.*: 51).

'Subtle realism' accepts that all knowledge is, at some level at least, a "human construction", but stops short of a fully relativist and constructivist position which would argue that the research process itself has created the phenomena which are reported and analysed. In my data collection I was mindful of an ethnomethodological (and, for that matter, Millsian) critique of too 'grand' a theoretical perspective. I accept that I have my own prejudices, interests and prior viewpoints which both informed precisely which data I collected and the way I perceived them. However, to account for



all of these would not be possible:

[Many of] the values, prejudices or subconscious desires of the researcher... are by definition not available for explanation by the person who has been influenced by them. (Seale 1999: 163)

In attempting to reflect back on my findings, I was informed by Lynch's (2000) 'inventory of reflexivities' and, especially, Pels' (2000:3) advocacy of "one step up reflexivity". This aims to add:

only one level or dimension of self-reference, not more, in order to display the narrative's hermeneutic point of departure and point of return.

A consequence, Pels argued, is that "reflexivity can never be comprehensively executed by the individual knower" (p.17), but should be delegated to "our friends, or rather: to our best enemies" (p.18). Which is to say, an individual researcher can only go so far in explicating his or her own findings in terms of personal reflexivity. One must rely on the community of research practitioners to properly scrutinise one's own findings in terms of personal biases.

Nevertheless, in the vein of guarding against the opposite accusations that I either displayed 'insufficient reflexivity' or collected merely 'impressionistic anecdotes', I wanted to ensure that the data, on which my analysis would be based, were detailed, reliable and plausible. This is in keeping with 'subtle realism', an approach which can be criticised for being unduly empiricist, lacking a means of accounting for hidden structures and effects. For example, as Porter (1993) showed with racism in a Northern Irish ICU, *critical* realism provides a more powerful means of analysing hidden injustices and issues. However, the starting point for a critical approach is that these particular injustices are present in the locale under study. Given the primary motif of personal and academic *exploration*, I did not want to presuppose the topics of analysis, which would be necessary in a study which adopts a critical realist perspective.

### **Theoretical perspectives**

In contrast to my assertion that data can be in some sense 'real', I take the view that social theories are neither 'true' nor 'real'. Rather, they can provide a useful resource for analysis, and ways of viewing phenomena (Silverman 1993). Since sociology has a theoretical component, it is said that 'theory' needs to inform all aspects of research,



including the selection of methods. Some methodologists have questioned the supposed link between “abstract philosophical issues and questions of research practice” (Bryman 1984: 79), but the problem remains that social research, and especially ethnography, is itself a social activity. If ‘theory’ is to be generated by research, the selection of research methods and analytical approaches require at least some theoretical input.

Prior to data collection I therefore considered two theoretical-methodological perspectives: ethnomethodology and symbolic interactionism. After a short period of data collection, I found that the appropriateness of these was questionable. I then considered a third perspective, Actor-Network Theory (ANT), which seemed to be a highly suitable approach. Unfortunately, during later concentrated periods of data analysis, I became increasingly dissatisfied with this perspective as I could not see how it would ‘fit’ in a useful way with the data. My unease at not having a ‘theory’ in which to locate the analysis was resolved when I chanced upon *The Practice Turn in Contemporary Theory* (Schatzki *et al.* 2001), where a number of leading scholars articulated a set of theoretical perspectives which generally had a closer alignment with my analytical concerns. In considering the perspectives of symbolic interactionism, ethnomethodology, ANT and ‘Practice theory’, I noted a number of similarities as well as differences. I will firstly highlight the key features (and shortcomings as far as this thesis is concerned) of symbolic interactionism, ethnomethodology and ANT.

Symbolic interactionism seeks to understand the perspectives of different social actors and thereby explicate the ‘inner logic’ of the ‘interaction order’ (Goffman 1983) and how it is constituted. It emphasizes the contingency of social interactions and actors’ everyday practices. In this perspective, the apparent stability of, say, an organisation is seen as a “negotiated order” (Strauss 1963). That is, formal and established organisational arrangements are subject to informal reinterpretation and review by organisational actors. The problem for this perspective, as I wanted to apply it to ICU, was that it seems to de-emphasise material reality (although in terms of the substance of empirical work, the most well-known ‘symbolic interactionist’, Anselm Strauss, notably did not focus only on the ‘social’, as I discussed in chapter two).

The ethnomethodological critique of symbolic interactionism was summarised by Cuff and colleagues (1990: 187):

In the sociology of work... one can find many studies of occupations, from



working on a factory assembly line to being a jazz musician. But one looks in vain in these studies to find any detailed description and analysis of the actual *work* itself, in its real world, experienced character.

Ethnomethodology (Garfinkel 1967) has a focus on the formal accounting methods, mechanisms and procedures utilised by social actors. It tends to focus on how ‘accounts’ are produced, rather than the substantive meanings to which the accounts pertain. A particular aspect of ethnomethodology is its strong empirical basis, which can be considered both a strength and weakness. I am sympathetic to a critique of theories which seem to be unobservable (and, in some cases, untestable). However, the focus on interpreting data in terms of how participants make themselves accountable together with the emphasis on practical reasoning in specific local contexts, logically result in ethnomethodology forming “hybrid disciplines” (Pollner and Emerson 2001): for this study, an “ethnomethodology of ICU practitioners”. So I ‘took’ from ethnomethodology a concern for accuracy of data, but I had the feeling that my analysis would not be fully ethnomethodological as I did want to my research to be generalisable to more than intensive care (as I discuss in the next section).

Having done a small amount of field work, I investigated Actor-Network Theory (ANT) as a potential theoretical approach, and at one time it seemed highly appropriate for several reasons. For example, ICU is a high technology area, replete with high technology machinery, computers and monitoring equipment. The work of ICU is knowledge-based, which raises the question of what counts as valid knowledge in this particular clinical context. Most notably, the materiality of the locale is very evident: even the patient in ICU is a primarily an asocial body rather than an interacting individual.

There has been considerable advocacy of and interest in ANT in recent medical sociology (Casper and Berg 1995, Mol and Berg 1998, Timmermans and Berg 2003). Whilst it has been used to examine the production of epidemiological knowledge (Bartley *et al.* 1997), there has been considerable medical sociological research on medical technologies, which have taken “an inclusive definition of technology, from CAT Scans to Calpol” (Elston 2003). Thus medical technologies can be regarded as ‘hard’, material artefacts, for example the metered dose inhaler (Prout 1996), medical decision support tools (Berg 1997b) or ‘telemedicine’ hardware (May and Ellis 2001). Alternatively, medical technologies might be ‘softer’, for example medical protocols



(Berg 1997a, 1997b, 1998, Timmermans and Berg 1997) or particular clinical routines and practices (Berg 1996, May and Ellis 2001). The approach clearly offers a valuable way to “re-conceptualise the relationship between technology and practice whilst avoiding a technological or social determinism” (Heath *et al.* 2003: 79). ANT-influenced research has demonstrated the complexities and inter-meshing of the social, material, natural and technological, how they all need to be managed and are mutually constitutive. It has been especially useful in analysing the introduction of new technologies into particular clinical settings.

Two key features of ANT (Latour 1987, Law, 1992) are the metaphor of the *heterogenous network* and the principle of *symmetry*, features which arose through developments in social studies of science and technology (SSST). Law (1992:381) noted that ANT can be seen as analytically radical in that it posits scientific knowledge as the product of

‘heterogeneous engineering’ in which bits and pieces from the social, the technical, the conceptual and the textual are fitted together... into a set of equally heterogeneous scientific products.

Various material objects (and networks) therefore are said to “*participate* in the social. They *shape* it” (p.382). Crucially, then, ANT does not accept either social or material reductionism in the first instance, and no priority is given to explanation in terms of ‘the natural’ or ‘the social’:

there is no reason to assume *a priori*, that *either* objects *or* people in general determine the character of social change or stability.  
(Law 1992: 383, emphasis in original).

This is the principle of symmetry, Latour’s “fourth rule of method” (Latour 1987: 141, 258). This principle, while precluding either social or technological determinism (Latour 1987, 1999a, 1999b, Timmermans and Berg 2003), can have a tendency to “deconstruct” differences between the social and the natural.

However, two analytical problems may arise. One is that it has a tendency to undermine actors’ perspectives (as acknowledged by Latour 1999a: 20), and these perspectives are a vital part of understanding the context and practices in that context. A second problem is that technologies, as used and applied in many practice settings, are already “black-boxed” (Elston 1997: 4, May *et al.* 2001: 1889): material artefacts or protocols are relatively stable in routine clinical practice. Thus, although the introduction of a ‘technology’ (broadly construed) may alter the practice (as



demonstrated by many ANT studies), there remain important questions about routine practice when such technologies are not being introduced. Furthermore, as Hutchby (2001) commented, material artefacts have “affordances”. They have resilient particular properties and purposes. It may be that these stable properties were not part of their design, and the ‘implementation’ of a technology changes its social use. But how artefacts and technologies are routinely used, once stable, remains an important question.

I would make the point that I do not reject ANT for any principled philosophical reason. Rather, I found it inappropriate for examining the practice of medical and nursing work since I did not focus on, for example, the attempted introduction of a medical technology. Later in my analysis I came to realise that my analysis of the routines of ICU necessitated circumventing an analysis of it as either a site of knowledge production or construction of facts (like a scientific laboratory), or as a site of the *introduction* of medical technologies. The restrictions of an ANT approach, as Heath and colleagues (2003: 84) argued, are that

The ways in which a particular tool or artefact is used and understood with regard to the practicalities at hand, the circumstances here and now, and the contingencies which have arisen, remain disregarded and in consequence we lose sight of the technology and practices through which it features in practical action.

Overall, I concluded that ANT’s fundamental utility was in analysing the production of knowledge or the introduction of particular technologies to particular clinical settings. This was an orthogonal analytical problem to my own analysis, as it had developed, of ‘knowledge-in-practice’. ANT seemed to have less relevance than I had originally anticipated to my own interests as they played out in my data collection and analysis, which, loosely ethnomethodological, was “analysis of the actual *work* itself, in its real world, experienced character” (Cuff *et al.* 1990: 187).

I was therefore left with the following problems with regard to the theoretical perspectives I had considered. Symbolic interactionism was too ‘social’, whereas ethnomethodology and ANT would be too specific (the former in terms of the context; the latter in terms of the direction of analysis). However, adopting elements of a ‘practice theoretical approach’ proved useful.

Schatzki (2001: 2) described how, while there is “no unified practice theoretical



approach”,

a central core... of practice theorists conceives of practices as embodied, materially mediated arrays of human activity centrally organized around shared practical understanding.

By taking a ‘practice theoretical’ approach, the related conceptual notions of embodiment, tacit knowledge, shared understanding and materiality can be analytically accounted for. I found these ideas important in my analysis of work and its organisation in ICU.

Firstly, then, embodiment. Rather than, say, mental and cognitive properties of individuals, “embodied capacities such as know-how, skills [and] tacit understanding” (Schatzki 2001: 7) become the focus of analysis.

Practice theory’s embrace of embodied understanding is rooted in the realisation that the body is the meeting points both of mind and body and of individual activity and the social manifold. (*ibid.*: 8)

Clinical work is an extremely good example of the way that skills and know-how are embodied in individual practitioners. Through a combination of formal education and experience, doctors and nurses learn how to use their bodies in skilled ways (as featured especially in the analysis I present in chapter six).

Related to the idea of embodied skills is the notion of ‘tacit knowledge’. Although, as Collins (2001: 107) pointed out, the idea of tacit knowledge is elusive and ill-defined, it has been proved fruitful in sociological analysis. Indeed, it can be regarded as a common facet of sociological inquiry:

A key maxim of the sociological project, at least in some of its variants, has always been to make the social world, including its taken for granted features and its self-evident truths, into topics for investigation (G. Cooper 1999: 3.5)

Axiomatic to the notion of tacit knowledge is that

Mastery of a practice cannot be gained from books or other inanimate sources but can sometimes... be gained by prolonged social interaction with members of the culture that embeds the practice. (Collins 2001: 107)

This leads to the idea that practices are not only learnt in a social context but are “embedded” (*ibid.*: 117), and “shared practical understanding” is manifested. A general presupposition of a practice theoretical approach, therefore, is that individualistic understandings of practices are not adequate (Barnes 2001).



Finally, practice theories attempt to account for materiality, joining a variety of ‘materialist’ approaches in highlighting how bundled activities interweave with ordered constellations of non-human entities. (Schatzki 2001:3)

While many practice theorists “acknowledge that nonhuman entities help to constitute human sociality” (*ibid.*: 11), they tend to resist Latour’s principle of symmetry and “presume the relative unity and integrity of human agency” (*ibid.* :11). The principle of symmetry is beguiling in its rejection of allegedly *a priori* and reductivist assumptions. However, as I indicated in my discussion of ANT above, ascribing ‘politics’ to material artefacts (Winner 1980), even if only for strictly analytical purposes (Law 1992: 383), may not be helpful in understanding some routine practices which strongly feature stabilised material artefacts and technologies.

At the level of ‘social theory’ criticisms may be made of contemporary practice theory, for example S. Turner (2001) criticised the notion of “shared understanding”. More generally, Barnes (2001: 19) commented that “any attempt to give a satisfactory account of social life must make reference to much else besides practice”. In response, however, a legitimate purpose of ‘theory’ in social science is to provide some useful hooks on which to hang empirical analysis. As I have already stated in more general terms, I am not arguing that practice theory is more ‘true’ than any other social theory. I wish to state that it has provided useful means whereby the work and organisation of ICU can be conceptualised and analysed.

It is worth noting that similarities are shared by the perspectives I examined - most obviously that they can use ethnography as basic method. But, in addition, we can note that ANT and ‘practice theories’ are closely related in bringing in the “material” for analysis (Reckwitz 2002). They are both also closely allied to ethnomethodology (Latour 1999a, Lynch 2001, Timmermans and Berg 2003). Furthermore, symbolic interactionism, at least in how it has been used in empirical research, can be seen as a kind of antecedent to ANT. Elston (1997: 6) observed that Strauss’ “inspirational influence” is widely acknowledged in the sociologies of both science and medicine. So a quite striking similarity can be discerned between ANT and Strauss and colleague’s study of hospital work (1997[1985]): the similarity in empirical findings is indicative of the theoretical and methodological similarities. One thinks in particular of their chapter on “machine work” which includes a “partial list” of the “differentiating properties of medical machines” (p.41ff) or the description of intensive care units in terms of both



micro-macro and macro-micro impacts (p. 227ff).

Such similarities should not be overstated, however. Strauss stopped short, for example, of explicitly ascribing “resistance” (Law 1992: 381) to machines; nor does his analysis (unlike ANT) appear in any way post-structural or anti-essentialist, deconstructing differences and oppositions between nature and culture.

Overall, then, in my analysis I found that ‘practice theory’ was the best way of bringing in my analytical themes and findings, for example, how knowledge was used in clinical practice, the material nature of the working environment and the embodied skills of ICU practitioners. As Karp (1999) commented, data should discipline theoretical reflection, and I tried to use my data in a disciplined manner to analyse these themes.

### **Generalisation and sampling**

The issue of generalising from qualitative research has been much discussed (Mitchell 1983, Schofield 1993[1989], Hammersley 1992, Seale 1999, Williams 2000a), such discussion no doubt arising out of the tension between ideographic contextual richness and a desire to say “something of something”. It can be argued that since qualitative research is concerned with depth and contextual understanding, generalisability is not an appropriate aim for a qualitative study. However this could result in qualitative research having a diminished status (for example, being likened to journalism rather than being seen as scientific).

A distinction is sometimes made between empirical and theoretical generalisability (Hammersley 1992). In the former, cases are often sampled purposively to reflect the population – the sample may not be statistically representative (as in probabilistic sampling of a population), but still exhibits the range of variation in the population to which generalisation will be made. In the latter, the aim of sampling is to make generalisations to theoretical propositions; generalisations beyond the sample can therefore be made based on “the essential linkage between two or more characteristics in terms of some systematic explanatory schema” (Murphy *et al.* 1998: 95). This may be particularly useful where the ‘total population’ is either not known or difficult to ascertain. Taking my cue from Williams (2000a), who argued that interpretive



researchers “can and must generalise”, I take the view that forms of both types of generalisation are possible in ethnographic research, but that there are important limits.

Seale (1999) cautioned against theoretical generalisability, commenting that in the end, given a fallibilistic approach to research (that research findings need to be testable in some way) all generalisation relies on future empirical justification. In addition, the actual development of concepts and theories from qualitative research should, in my view, make links to earlier research. By implication, I am arguing that empirical analysis may generate not only ‘substantive theory’ about a particular context, but concepts which may have more general applicability. These concepts, however, are necessarily tentative, rather than a “formal theory” (Glaser and Strauss 1967: 79ff).

Williams (2000a) coined the term *moderatum* generalisation to indicate the limits of generalisation in interpretive research. His conception of generalisation was an empirical one: “aspects of [a situation] can be seen to be instances of a broader recognisable set of features” (*ibid.*: 215). Such generalisations are distinct from statistical generalisation, where the probability of a situation occurring elsewhere can, in principle at least, be estimated.

In their accounts of the logical bases of qualitative generalisability, Williams and Seale seem to have ignored the logical possibility of qualitative (interpretive) research building on and linking to earlier research. This might be because of the qualitative research’s ideographic traditions – which can be criticised for an inherently inductive bias: the analytical tendency can be to identify associations between phenomena which are empirically present in the locale studied. However, it seems to me that qualitative research can draw on earlier findings, and that this can be conceived as ‘testing theory’. Such ‘testing’ need not be purely deductive (which would presuppose the topics of analysis and thereby undo the distinctive ethnographic advantage of flexibility). But to consider earlier research findings and existing concepts can help to guard against the shortcomings of induction and build cumulative knowledge by, for example, specifying in what ways earlier theory does (or does not) apply. An example of ethnographic research being used in this way is Atkinson’s (1995) study of haematologists. He drew on current and traditional sociological issues such as uncertainty, medical knowledge and the social construction of the body: his analysis was not a purely ideographic description of haematologists.



In summary, I take the view that generalisability can be an aim of ethnographic research, and so an important criterion of research findings is *fallibilism* (Seale 1999). Theories generated must be treated as ‘working hypotheses’, subject to (future) empirical testing. But likewise, the ethnographically based analysis, if informed by earlier research, can itself also be regarded as *testing* the theoretical aspects of that earlier research.

### Sampling

At the outset, I felt that there were two main stages of ‘sampling’: first, which specific sites would be visited; second, on site, decisions would have to be made about what kinds of data to collect. The former aspect involved developing a ‘sampling frame’ for the sites to attempt to access. The latter aspect I considered to include ‘sampling’ work at different times of the day and week, and ‘work-shadowing’ different categories of staff.

My rationale for sampling of ICUs was informed by Patton’s (1990: 186) recommendation:

qualitative sampling designs specify *minimum samples* based on expected reasonable coverage of the phenomenon given the purpose of the study and stakeholder interests. (Emphasis in original).

Following a pilot study I concluded that worthwhile data could be collected for, at most, three or four ICUs (see next section on ‘data collection and analysis’). This would be the ‘minimum sample’ as specified by Patton.

Through the course of discussion on ‘sampling’ I realised that Patton’s phrase “stakeholder interests” needed to be very broadly considered. My initial interpretation of the phrase was political: that the stakeholders (“research consumers”) would be ICU Nurse Managers and Clinical Directors in the UK, and they would need to be convinced that the analysis and results could apply to their ICUs. Therefore ICUs would need to be purposively sampled in order to cover the “broad variation” of ICUs in the UK (although I had noted that all ICUs have particular local contingencies and contexts which pertain to their local organisation). An Advisory Committee Meeting discussion



broadened out my understanding of ‘stakeholders’ to include other consumers of research, particularly other health services researchers. In this context, the term “sampling” (with a particular epidemiological meaning of probabilistic sampling) became particularly prone to different understandings.

Given the original aims of the study (identifying ‘organisational factors’ in ICU), consideration of the (mainly biomedical) literature prior to an Advisory Committee Meeting had indicated that the following dimensions could be perceived as important in the local organisation of ICUs: the size of the unit and hospital; the teaching status of the hospital; whether it is located in a city or a town; and the (NHS) region in which the ICU is located. For example, ICUs in the UK vary between 4 beds or less and upwards of 25 beds, and it is reasonable to assume that the purely organisational and management concerns of a four bedded unit (total staff of around 35) are different from a 25 bedded unit (total staff of around 200). Likewise, a difference in city and town location or region could affect the kinds of patient admitted, staffing issues or “organisational culture”. Now, these ‘dimensions’ overlap. It was not my intention to account for whether a particular dimension is related to some or other set of observations; rather, I was trying to include as many ‘plausible characteristics’ in the sample, given ‘stakeholder interests’ – the stakeholders being conceived as the ICU managers. I suggested that these managers would be likely to consider that their units are similar to other ICUs in hospitals of similar size and similar teaching status. Through sampling different types of ICU I was attempting to forestall a criticism that my research would only apply to certain types of ICU. For personal reasons, and for ease of access, I initially proposed visiting ICUs in the South East of England, supposing that within that sample I could still visit different types of ICU. However, the case that this sampling frame was adequate was not successfully made to other disciplinary frameworks, as I now discuss.

It was assumed in the Advisory Committee Meeting that my study findings should be generalisable to the whole population of NHS intensive care units (approximately 250), and that collecting data from ICUs only in the South East of England would not meet this objective. The issue of scientific generalisability was manifested in two ways. First, there was a concern for some kind of national representativeness:

I understand that, for personal reasons, sticking to London and surroundings makes sense but I am concerned about this. From my informal observations in >100 units, I think nurses play a key, yet probably indirect, role in the organisation of units. The nursing



workforce in London and surroundings is not usual, is not a stable/static one and this may, in my opinion, have ramifications. The London effect (i.e. young, free and single) extends quite far outside London and I would encourage you to make one of your sites further afield. Out in the “sticks”, the older, more mature, nurse can dominate. Just a thought? (Email from Advisory Committee Member, 12 October 2000)

I had eschewed the issue of ‘regional representativeness’ because I felt that the issues of staffing, regional culture and regional factors, while perhaps important practical and theoretical issues, would be unlikely to be addressed satisfactorily by a relatively short study focussing on ‘local organisational factors’. But I did include one site from out of the South East of England (where, in the event, I collected most data).

A second manifestation of the issue of ‘scientific generalisability’ assumption in sampling was to try to identify ‘within-type variation’:

C discussed ‘within-type variation’. He suggested that there be two units in the sample which were ‘similar’ to see which observations hold across ‘similar’ units and which do not. (Notes from Advisory Committee Meeting, 12 October 2000).

Whilst it could be countered that there could not be sufficient variation in the ICUs for there to be ‘hypothesis testing’ within the parameters of the study, there would still be analytical value if findings across ICUs could be compared.

Both the comments above represented plausible and important concerns, but it was still important to limit the total number of ICUs to be visited in order to develop rapport with ICU staff and facilitate ‘understanding’ of sufficient ‘depth’. Using ICNARC data on ICUs in the Case Mix Programme, I developed the following ‘sampling frame’: two medium-sized ICUs in District General Hospitals (DGHs) in Southern England; one medium-sized ICU in a DGH in Northern England; and a large ICU in a teaching hospital.

The ICUs I proposed to visit within this ‘sampling frame’ were selected pragmatically: they were ICUs where I knew at least one individual (although this did not make gaining access completely straightforward, as I discuss in the later section on that topic). Because of this selection strategy, there remain possible ‘biases’ in the ICUs I visited, which is an issue to which I return in chapter nine. In the event, I only collected data at three ICUs, due to time constraints: I found that I took more time on basic data collection, especially reviewing and converting field notes to ‘fair notes’, than had been indicated from my reading of the methodological literature (see section ‘Data collection and analysis’). I gave the three ICUs I visited pseudonyms, as in Table 3.1.



Table 3.1 Sample of ICUs

County	Eight-bedded ICU in a DGH in a town in Southern England
Urban	Eight-bedded ICU in a DGH in a city in Northern England
Metropolitan	Large ICU (around twenty beds) in a London teaching hospital

Within each ICU, I ‘sampled’ different days of the week and times of day. Most observational data was obtained from Urban: since the data collection seemed to be productive there I stayed there for as long as possible. The staff there were friendly and welcoming, but an additional benefit was that I stayed away from home and so had fewer domestic distractions (this is unfortunate, since it implies that better data are collected away from home comforts, and that home life might be vulnerable to engaging in ethnographic inquiry).

#### ‘Sampling’ of staff

At each site I also tried to have conversations with, or ‘work-shadow’, different grades and occupational groups of staff, although I must admit that this was not very systematic. In part this was because as I followed one individual around I also recorded the activities of others, as well as interactions. I also had a lot of informal conversational data from nurses, doctors and administrators, as I often based myself at the central Nurses’ Workstation<sup>2</sup>. The Nurses’ Workstation, especially at Northern, provided a view over the open part of the ICU.

Table 3.2 describes grades and occupations of ICU clinical staff and Table 3.3 lists the in-depth interviews I conducted. It can be seen from these two tables that more interview data was collected at Metropolitan. This reflects both that observational data was harder to acquire there (as I discuss in the section on ‘gaining access’, below) and that, as the last of the three sites I visited, I had become interested in obtaining

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<sup>2</sup> I use this term (in general usage by ICU staff; sometimes abbreviated to ‘workstation’ or called ‘Nursing Station’) to identify the suite of desks at which the Ward Clerks sat. There was one on each ICU I visited, and patients’ monitors were usually visible from it. The term presumably derives from their use in hospital wards, where nurses do their paperwork, but is something of a misnomer in ICU as nurses generally remain at a patient’s bedside. When the unit or nurses were less busy, though, nurses often sat at the Nurses’ Workstation, as did the junior doctors and, occasionally, the Consultant. I discuss further methodological implications of this below.



practitioners' views on the analytical themes I had started to identify.

Table 3.2 Occupations and grades

Nursing Staff		Medical staff	
Nurse Manager	Grade H or above. Few (if any) clinical shifts.	Consultant	One Consultant 'on-call' for at least 24 hours. One Consultant is 'Clinical Director'.
Senior Nurse	Grade F or G. Lead a shift, may be supernumerary. 'Charge Nurse' (male) or 'Sister' (female).	Specialist Registrar (SpR)	Could be either on the junior doctors' shift rota or a separate SpR rota.
Staff Nurse	Grade D or E. Usually have an intensive care nursing qualification.	Senior House Officer (SHO)	Usually on a six-monthly rotation in ICU.

I use the above terminology in this thesis, and tend to follow the convention within ICUs of implying the sex of the Senior Nurse by referring to 'Charge Nurse' or 'Sister', unless I am making a general point. It is important to note that there is some overlap in these terms, though: for example, the Nurse Manager at one ICU seemed to be undertaking 'clinical duties' almost as often as other nurses. Similarly, the Senior Nurses were not always 'supernumerary', and may have been assigned to a patient. Sometimes more than one nurse of Grade F or G would be 'on duty'; in these instances one would be in charge of the shift and any others would be assigned the more 'technically difficult' patients. As a general point, I would note that in all the ICUs I visited the Nurse Manager post was occupied by a woman; the Senior Nurses were a mixture of male and female; and the Staff Nurses were mostly women. For doctors, the gender mix was reversed, with a roughly equal mixture of male and female among the junior doctors and nearly all the Consultants being men (all the Consultants from whom I collected data were men).

Formal in-depth interviews, as distinct from discussions taking place in an *ad hoc* manner on ICU, lasted about forty-five minutes. I drew up a topic guide prior to each interview, and, when convenient, tape-recorded the interview or otherwise made contemporaneous notes and reviewed them immediately afterwards. The interviews were intended to fill in the gaps in my understanding as I perceived them at that time, so



the questions asked varied.

Table 3.3 In-depth interviews

	County	Urban	Metropolitan	Other
Consultants	B (male)	B (male)	B, C (both male)	B (male)
Junior doctors			D (male SHO)	C (male)
Senior Nurses	C (female)	C (male)	E (female)	

### **Data collection and analysis**

I recorded my field notes openly in a notebook during the observational periods. No personal patient details were collected. The notes included direct observations, impressions, analytical thoughts and possible interpretations. I did not separate these at the time, considering it much more important to ensure there was a written record. As I typed the field notes up I included analytical thoughts and interpretations as memos or notes in a separate analysis book. I followed the general recommendation to review field notes very soon after the period of observation, and subsequently type them up neatly (but having reviewed and made legible the notes very soon after the period of observation I did not regard the typing up with the same level of urgency). The quick review of notes facilitated both further recall of the events observed and also the disaggregation of the data into descriptive and analytical components.

As presented in this thesis, my own notes have been grammatically corrected to aid readability. Single quotation marks (‘ ’) indicate a paraphrase of spoken statements, double quotation marks (“ ”) indicate verbatim (or near-verbatim) quotations. Individuals are identified by an initial (changed from their own), usually followed by their occupation and grade. Square brackets [ ] in the text of the notes indicate insertions to improve readability or understanding. Each piece of data is followed by a note of the ICU at which the data was recorded and the visit number, or, for the case of interviews, the staff member’s occupation and approximate grade. There are some data which I regard as particularly sensitive and I have omitted this information.

Fielding (1993) commented that it takes about as long to write up field notes as the time



spent in the field. I found this to be a conservative estimate. It took me about as long to perform the task of reviewing notes (making them legible and adding additional data) as I had spent in the field. It then took the same length of time again to type up the notes. In total there were approximately 300 hours of observational data.

The typing up was when I began analysis proper, in that as I typed up I noticed broad themes. I tried at one stage to type notes onto a laptop straight after data collection, but found that this took too long: it was more efficient to ensure that the original notes were legible and to add other thoughts as they occurred. I used the back of my notebook for additional notes of some length. The 'fair notes' were typed into a word-processor, stored electronically, printed off, and imported into the NUD\*IST (Non-numerical Unstructured Data Indexing Searching and Theorizing) software package to facilitate analysis.

Analysis began alongside data collection, informed by Glaser and Strauss' (1967) "grounded theory". As analysis proceeded I did not rely only on the data which I had collected: I felt it was important, as I identified themes in the data, to make links to existing concepts and discussion in medical sociology. In relation to these I followed, rather unintentionally, Glaser and Strauss' polemical view of "theory capitalists", that is, those social theorists who regard the mass of the social research workforce as the mere testers of *their* theories. Empirical research should not be construed as only testing grand theories; rather, as Glaser and Strauss (1967) were advocating, the more valid prevailing concepts and theories have themselves been derived from empirical analysis (as discussed in chapter one).

I used NUD\*IST to organise the storage of data and to develop and modify codes and themes for analysis. I found the package helpful for indexing and retrieval in that it enabled mounds of data (approximately 100,000 words) to be simplified. I used NUD\*IST for searching for words and phrases in my data (which were often words or phrases I thought I could remember), but did not use its logical operators for development of testing of theory, since that would have necessitated specifying the unit(s) of analysis. I felt this would have been too restrictive given the topics and themes of my analysis. I have not, either, used all the coding and categories developed in my analysis in this thesis, although I did ensure that I reviewed all my text for coding of the categories and themes I have eventually presented. The cognitive process of



analysis was probably abetted by thinking hierarchically in terms of subcategories, but the themes as presented often include several different ‘codes’. Once I had my main categories and themes, determined by level of interest and sufficient data to make a reasoned argument, I printed off the data for ‘pen and paper’ review and further analysis. The amount of data had to be enough to give context and subtlety, but small enough to be manageable. It was at this stage that I would engage in prolonged ‘library research’, identifying relevant literature on the themes I wanted to analyse. Thus while data *collection* at each site proceeded in series with periods of analysis, the analysis itself was iterative with identifying and reading relevant literature.

### **Gaining access**

Hornsby-Smith (1993: 54-5) captured the political nature of qualitative, especially ethnographic, research:

Gaining access is a political rather than a normative problem, so that ‘playing it by ear’ is an inevitable component of the negotiations, with the researcher frequently having to make instant decisions and think on his or her feet.

The term ‘political’ here, in contradistinction to ‘normative’, emphasises the degree of persuasion which may be required. It is not a normative problem as there are few *general* rules, norms, standards or models to follow – given that one traditional purpose of ethnographic inquiry is to study different cultures and explicate *their* norms and standards, it would be somewhat perverse to have an expectation that ‘gaining access’ could be articulated in terms of a set of procedures which can be followed. Of course, there are general cultural rules which may be followed in researching, as I was, a specific organisational context within a broader culture with which I was familiar.

Although no normative procedures have been articulated for ‘gaining access’, it is well discussed in organisational ethnography and a number of commonalities in the experiences have been identified (Burgess 1984, Bryman 1989, Hammersley and Atkinson 1995, Smith 2001). It is often represented as a series of processes, including phases of “getting in” (physical access, and negotiation with key ‘gatekeepers’), “getting on” (social access) and “getting out” (successful closure). Gaining (and retaining) access is a process which continues throughout all phases of data collection, and thereby has ethical as well as political dimensions (British Sociological Association



1992, Murphy and Dingwall 2001). I highlight here several considerations in gaining access, using data from the ICUs I visited. But I will firstly report on the negotiations for a site where I did not, in fact, collect any data, because the rather prolonged negotiations with a Local Research Ethics Committee (LREC) broke down.

Ethical approval for the study had been given by the London School of Hygiene and Tropical Medicine (LSHTM) Ethics Committee, but the original thinking had been that as no patient contact, nor medical intervention, was intended there would not be a need to obtain LREC approval. I had assumed that each visit to each ICU would entail on-going negotiations with staff members as they meet with the researcher and are observed in their work. I referred to, and intended to follow, the British Sociological Association's (1992) "Statement of ethical practice" as the major professional statement on the ethics of qualitative, observational study. This was clear about the principle of 'informed consent' for all participants, and, whilst formal, signed consent was to be obtained from appropriate gatekeepers at each ICU, the purposes of the study were to be explained to other members of staff as necessary (an information sheet was prepared for this purpose). However, the view that formal LREC approval would not be required was countered at an Advisory Committee Meeting, where it was decided that I would have to obtain approval from the LREC for each ICU<sup>3</sup>.

I attended two meetings and supplied copious supplementary information for the LREC at one NHS Trust, whose basic issue was that its members had not previously reviewed an ethnographic study. After I had completed their form, they asked me to present the research to them to answer questions. They asked for supporting letters from the people who funded the research and from my head of department. They then asked me to present the research again, and this time to attend the meeting with the ICU Clinical Director and the ICU Nurse Manager (who were both supportive of the research). The questions at the meetings were, it seemed to me, overwhelmingly methodological: for example, I would not be able to record everything happening in a "busy ICU". A clinical psychologist on the committee insisted that I needed a definite framework for analysis.

My answers were apparently not enough to convince them, and in the end they asked

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<sup>3</sup> See Appendix Two for the 'Study protocol' presented to the LRECs and Appendix Three for the Information Sheet presented to participants.



me to withdraw the application, since they “felt unable to approve it”, although they did say that if other LRECs approved the study they would reconsider. Part of this may be due to my inability to convey adequately the theoretical basis of the research; this in turn was exacerbated by my own media-influenced perception of ICU as a particularly dramatic, serious and emotionally involved locale. By the end of the discussion I gave up and went with three other sites: one of these approved the study by chair’s action and the other two with minor amendments to the information sheet and notices.

A charitable interpretation of the first LREC’s inability to approve the study is that very different understandings of what constitutes sound research were held by the LREC’s members and me. An uncharitable interpretation (proffered to me by the ICU Clinical Director) was that one member of the LREC had a strong personal motivation for not allowing an independent observer onto the ICU.

At one level I could leave this account as further evidence that LRECs are inconsistent in their decision-making, and that researchers need to prepare for this inconsistency in planning their research. However, there are also serious ethical ramifications, which arise out of an incongruity between ethnographic research and biomedical ethics. Two apparently opposite reactions to this incongruity are both unethical. On the one hand, inappropriate (methodological, or scientific) criteria can be applied to a research proposal and it is found to be ‘scientifically unsound’ (for example, there is no hypothesis, no control group, no outcome measure). On the other hand, research which does not consist of a patient intervention nor collection of patient details might simply be ‘passed’ by an LREC since there is assumed to be no danger of harm to patients. But there might still be important ethical issues to be resolved in such research. The ironic effect of LREC forms being designed around an experimental model of research is that non-experimental and non-biomedical researchers are not encouraged to consider ethical issues in their dealings with the LREC. Ethical and political issues are inextricably linked, since how we think human beings should be treated is at least in part a reflection of prevailing views of values in society (Murphy and Dingwall 2001). However, it is surely not right that my dealings with one LREC began to feel like politics in the pejorative sense of the word. The development of a field of knowledge about the ethics of qualitative research is hampered if gaining ethical approval is seen (which is how I saw it) as jumping through inappropriate hoops and tick boxes.



Once LREC approval had been negotiated, physical access to the organisation could be considered. I undertook a week-long ‘pilot study’ at an ICU where a senior member of the medical staff was known to me and had indicated his willingness to participate in the study. This made the first stage of negotiating access (*i.e.* through a gate-keeper of some seniority) straightforward, but I then had to negotiate ‘social access’ with the other staff members. In reviewing this theme I noticed that there was more data on my acceptance by the junior doctors than other groups of staff. There are several reasons why this occurred. Firstly, the junior doctors were permanently represented on the ICU, and did most of their work at or around the Nurses’ Workstation (where I initially based myself). Secondly (and more problematically), I found the junior doctors easy to get along with as a group. This is not surprising, since the commonalities between myself and the junior doctors in terms of age, personal background (well educated, middle class) and current job status (junior/trainee professional) are readily apparent. I noted this as a possible danger to guard against in on-going ethnographic work. In mitigation I also have notes which indicate that since I was ‘hanging around’ the Nurses’ Workstation I also found it easier to develop relationships with the administrative staff and the Senior Nurses and, at later study sites, Staff Nurses.

The first stage of acceptance was formal acknowledgement. Thus I was introduced by the Clinical Director:

‘This is Simon, who is a researcher interested in organisation, possibly linking to patient outcome’ – “but not here to make judgement/assessment”. (County, visit 2)

During this first observational visit the discussions I had with clinical (nursing and medical) staff were generally assuring them that I was not making any formal assessment of individuals or of the unit. I based myself at the Nurses’ Workstation and talked to the administrative staff, who then introduced me to other people as they came by. On the second period of observation, after arriving, someone told me that they had been about to say “Simon will be here” just as I arrived (County, visit 3). Later on, during the same visit, I noticed that the Information Sheet I had provided to the Nurse Manager was stuck into the ‘Communication Book’ (located behind the Nurses’ Workstation) along with a hand-written summary (in the Nurse Manager’s handwriting) of how often and for how long I would be around (County, visit 3).

The second period of observation was a night shift, and I suspect that by staying around for the whole shift I gained credibility with the staff on the unit. For some of the shift I



'shadowed' the most senior of the junior doctors (a Specialist Registrar, 'D'), an individual who appeared to be on friendly terms with all members of staff. During this period of observation D often spoke to me explaining to me about what he was doing and why (one advantage of joining the night shift was that because there was a lower level of overall activity it was easier to engage staff members in conversation). D also talked a little bit about the ICU in general and we spoke about my research.

To return to the theme of my 'acceptance', I recorded my arrival on the third observational visit as follows:

I arrived at the ICU at 8.45am. At the entrance I announced myself as "Simon Carmel, here to do a research study". The reply was "Come on in". This was E (SHO) - she later told me that she recognised me on the monitor. When I went through the door I said "hello" straight away to those I could see hanging around the Nurses' Workstation; I took off my coat, walked the few yards to the Nurses' Workstation and said hello to the others who were there. At this stage there were about half a dozen people 'hanging around'. I had a feeling of being welcome – smiles, eye contact etc. I recognised most of the faces from earlier visits. (County, visit 4)

That I *was* welcome, and not just *felt* welcome, is supported by the fact that later that morning I was invited by two SHOs to the doctor's mess during a fifteen minute break between the ward round and the main teaching session of the week. I was also invited to lunch and on several social evenings, especially at Urban ICU.

Thus the process of gaining acceptance was enhanced by 'hanging around' the Nurses' Workstation, thereby being introduced to staff members by the administrative staff, and by choosing to observe the ICU at night early on in the study. Two methodological lessons were learnt from this first phase of data collection. First, observing a night-shift quite early on seemed to establish credibility with the other ICU workers who also have to work at unsocial hours. ("Brewing up" also proved to be a popular move, especially at night and weekends when there were fewer administrative staff around to perform this activity). Second, 'shadowing' workers should not be restricted to any particular group. This implied that at the very least I would need to 'shadow' one of the nurses at the patient's bedside and more senior doctors and nurses.

There were differences between ICUs in how I could ease my way in to the 'life' of the ICU. As already discussed, at County, there was space for me at the Nurses' Workstation, where I could chat to staff members as well as get a view across the ICU, gaining a general impression of the work of the ICU (although my discussions with nurses were impeded there as the nurses were officially not allowed to spend time at the



Nurses' Workstation). Urban ICU was similar in that I had somewhere to sit down, but an additional advantage was that the Nurses' Workstation was more of a focus for staff taking short breaks and so I was able to chat informally to the nurses. However, at Metropolitan, there was not this ease of 'observation' and 'chatting':

There's not really anywhere for me to sit down; the rooms and bays all feel quite cramped and/or crowded. Visitor's room also looked crowded. Very little meeting space. (Metropolitan, visit 2)

At Urban, the initial process of gaining access had been quite formal. Having gained approval in principle from the medical staff, I had to discuss with the members of the nursing profession. This started with the Nurse Manager (Burgess (1984: 196) commented that in organisational ethnography access often takes place in a top-down fashion). During a later period of data collection, one of the nurses told me that the Nurse Manager had apparently been worried about me being around, had been saying to her staff "be careful what you say":

I notice D (Nurse Manager) has written about me in the 'Staff Communication' book, on the date of my first visit. She had written that I would be starting soon to look at organisational and management issues, "so be professional and be wise". (Urban, visit 22).

D was therefore cautious about my presence at that early stage. But by a later visit, it seemed she had become reassured about my research:

D says to me "Are you still writing notes? I keep telling people - no lewd comments around the [Nurses'] Workstation", SC: "Does it work?" D: "No". (Urban, visit 23)

Although she had originally been worried about my presence, and what I would find, after I had been around the ICU for several months she herself was able to joke about her own concerns.

However, the level of 'reactivity' of research participants still had to be managed, as I found in a more complex set of issues with one Consultant, one of the "sponsors" at one of my research sites. I had known him for some time and it seemed clear that his interest in my research was facilitative in getting my study approved by the LREC and various managers at the hospital.

However, as the research progressed I began to suspect that he did not have the best of working relationships with some of the staff on his unit. On a couple of occasions I overheard irritated mutterings – comments that I did not overhear being made about other Consultants. By various means my research was associated with this Consultant,



and I felt that several nurses were avoiding me and began to wonder if I had inherited some latent animosity. While I was very indebted to him for facilitating access, he seemed to occasionally irritate some of the very people to whom I was trying to speak. In addition, on a couple of occasions he pointedly flagged up what I ‘should be’ observing. For example:

J said to me ‘the ICU is quieter than normal because of the worries about a very sick patient... it would be good if you could record that’. (Reference omitted).

I have to say that I did not actually observe any difference, and was worried at this point that my powers of observation were inadequate. But I later went for a drink with some of the nursing staff. I asked them whether that day had been a difficult one; they indicated not any more than usual. So I was reassured that my powers of observation were not totally amiss. But I was concerned then about my role, and more aware of a bigger issue: here was one ‘key informant’ behaving in ways which sometimes made him unpopular and seemingly trying to influence my research.

The next thing that happened was that I witnessed a heated discussion in a meeting. A short time afterwards,

J came over and said quietly to me that I shouldn’t discuss the ‘incident’ with other people on the ICU, although I could discuss it with him. He said that that kind of thing was very unusual. (Reference omitted).

The strange thing was that other people in the unit *were* talking to me about it. I decided to focus my research effort in other directions, getting alongside others of the doctors and the nurses: individuals who were sufficiently interested in my research to talk to me about their work (rather than mine), but not so interested that they wanted to tell me what to record or analyse.

Ethnography involves developing sufficient rapport with research participants, and I was reassured at having my presence acknowledged through the use of humour. Initial prosaic concerns of the research participants reflected the politics of the NHS: would my report appear in the *Daily Mail*, did I have hidden microphones for a television documentary. But soon I and my notebook were the butt of several jokes. When I spoke (genuinely) of my fascination for the routines of ICU, the reply was “you should get a life!” Among several nurses, the teasing was that I should have been able to help them when they were short-staffed:

G (nurse bed 1) called for help with a lift. Someone replied ‘there isn’t anyone’. G: ‘there’s a big strapping researcher over there.’ E (nurse): “Put an apron on Simon”. I



was glad to be ‘acknowledged’, but excused myself saying ‘I haven’t been trained.’ Someone replied “neither have we”. F (nurse) then said “You’re a researcher? I thought you were a boring old doctor. What are you researching?” (Urban, visit 6)

And similarly, on a later occasion:

J (nurse) says that they were short of nurses yesterday – ‘we only had six on’. Seeing me, she says “Simon didn’t help either.” K (Senior Nurse): “Did you not get your pinny on, Simon? I bet you’re a quick learner.” I explained that I was actually a slow learner, but she responded that it was ‘only wiping bottoms and things - surely you can learn that?’ (Urban, visit 24).

The paradox for this style of research is that, up to a point, the greater the ‘reactivity’, in terms of acknowledgement of the researcher’s presence, the better, in that we can infer that people are less ‘bothered’ about what I was recording in my ‘little book’. Gaining acceptance is also a two-way process, and some self-disclosure about my personal and work life helped to develop relationships in the field.

In summary, then, the strategies I used for gaining and retaining access demonstrate both the positive and negative aspects of ethnographic research. Gaining access is inevitably not just a negotiation but a series of on-going negotiations. The interest of research participants has to be managed in some way. The passage of time can be important: over time, with no particular effort on my part, several Senior Nurses became reassured about the purpose of my research. There is also, it has to be noted, a rather seedy side to ethnography. Covert discussions and, on occasion, workplace gossip provided important resources for me in both becoming accepted as a member (albeit a marginal one) and in understanding some of the activities at an all-too-human level.

It is well noted that ethnography is a ‘flexible’ research method, in that one is able to change the direction of research if necessary. This has usually been noted with regard to themes of analytical interest, but I also found that ‘flexibility’ can also be applied to dealing with ‘political’ issues as they arise. This reinforces the tenet that as a method where the researcher is the ‘instrument’, and the ‘objects’ of research are human beings, ethical and political issues are inextricably linked (Scheper-Hughes 2000, Murphy and Dingwall 2001).

### **The presentation and management of self**

[The fieldworker] must preserve freedom to manoeuvre in his self-presentation by suggesting – through dress and demeanour – a marginal social status for



himself, halfway between bureaucratic office holder and card-carrying subculture member (“research student” often does nicely). (Butters 1976: 261)

This might fit well with researching ‘sub-cultures’, but for my research I decided to wear smart, professional style of dress (tie and shirt-sleeves). One nurse assumed I was a junior doctor; one non-ICU doctor thought I must be a consultant as I was smartly dressed but hanging back from the nitty-gritty of patient treatment. In later stages of data collection I slightly down-graded my dress to polo shirt, although I do not think any style of dress would have been without ambiguity. In any event, I tried to ensure that my name badge, stating “Observer”, “Researcher” or “Research Fellow” was always visible: I could see no justifiable reasons for engaging in ‘covert’ research. Having a name badge helped me to feel that I might appear to be a “bureaucratic office holder”. I could conceivably have attempted to obtain an honorary contract to work as some kind of assistant, which may have given me insight into some aspects of the work which was undertaken on ICU, possibly making up for my lack of clinical background. However, a disadvantage would have been that this would have meant me having to spend time engaging in work other than data collection, even once the role had been learnt (which would have been in addition to learning about being an ethnographer).

So I was in general free to make and record observations, at the ‘complete observer’ end of the participant-observer spectrum. Although I had no other duties, and was not distracted by nor engaged in other work as would have been the case had I been a ‘participant-observer’, I did get drawn in to the physical work of ICU once or twice.

For example:

F (doctor) and G (nurse) are preparing the patient for a transfer. For forty minutes from 7.0pm I have made no notes, as I was involved: holding various pieces of equipment, drugs (they have to make up spare syringes...), I ended up holding some wires as they moved the patient across to the trolley. They then asked me to carry the patient’s medical notes and drugs on the transfer itself. (Metropolitan, visit 8)

The next day, this doctor seemed to regard me as a useful ‘assistant’:

As I walked in to the unit, F (on the phone, covering mouthpiece) says to me “Have you seen H [SHO]? Can you just ask her if she’s spoken to the haematologist[s], and what did they say?” I felt compelled to go to find H, but also rather uncomfortable. She was [in one of the bays], behind closed curtains, doing some kind of procedure (had theatre apron on). I had to ‘interrupt’ her to speak to her. She told me something like “probably sepsis, definitely infected, I haven’t had a chance to look at the film.” I desperately hoped I’d committed that correctly to memory accurately, and was nervous in case I relayed the wrong information to F. On top of this, when I returned to where F was he was still on the phone and I had to wait for him to finish - this scared me even more – that I might mis-relay the information. Isn’t “poor communication” how most medical errors occur?! (Metropolitan, visit 9)



The main disadvantage of being a ‘complete-observer’ was that the setting was initially strange. However, this was advantageous as I kept a record of the ways in which the setting felt strange to me, and I entered the field with fewer pre-conceived ideas than someone more familiar with intensive care, thereby open to different ideas. Having virtually no clinical knowledge, the possibility of being distracted by purely ‘clinical’ questions and activities was lessened.

The possible effect of having an observer present may have affected the way that work was done. Two junior doctors thought that my presence was “skewing the research”, since, they said, all the staff were doing things “properly” when I was observing. I think this might be true to a limited extent, perhaps especially towards the beginning of data collection at each site, as people were getting used to my presence. However, Strong (1979a: 229ff) commented that it is important not to overestimate any ‘observer effect’, since in medical settings,

the daily business of life has to get done and in clinics there was no other time and place for it to be done.

He also pointed out that the settings for his research were “public places”, with many other individuals in earshot of conversations. Once in ICU, they too are ‘public’ with activity in different parts of the ICU visible. It is important also to state that in an acute medical context it is not entirely unusual for someone to be waiting around (*e.g.* junior doctors or hospital administrators carrying messages from one consultant to another), nor for someone to be taking notes.

I had several anxieties about my research. One was about the research findings. Some respondents talked knowledgeably about concepts in social science (‘depersonalisation’ and ‘paternalism’ were terms mentioned more than once). I was also concerned that the findings would be either ‘obvious’ (Gage 1993[1991]) or irrelevant:

It occurs to me that a public health type study, ‘assessing’ or ‘evaluating’ care would be a lot easier. You could get a lot of information from the staff in interviews, and come up with recommendations. I suppose that’s what management consultants do. What I’m doing seems inherently confused. (Urban, visit 3)

At this stage I wistfully thought how much easier it would be to produce a management consultancy report: ask everyone what they thought and then come up with a series of recommendations based on a synthesis of everyone’s opinion.

There were also occasions of self-doubt and anxiety. On occasions people had said they



would speak to me later, and then either did not have time, seemed to avoid me, or just forgot. I was introduced to some staff members as potential ‘informants’ and then was surprised when they seemed uninterested in, even hostile to, the research. I was also anxious about having no formal role on the ICU, and felt marginal as a result.

A final unanticipated anxiety resulted from the ‘24/7’ nature of the service. Not wanting to ‘miss out’ and getting caught up in the ‘stories’ of the day meant that I was sometimes torn between the discipline of reviewing notes, and recovering from extended periods of data collection, and staying on the ICU to record more data (I had noted that the level of detail of my notes diminished after about three hours of observation). I had not anticipated this as a problem: I had identified the ‘24/7’ aspect as something to ‘cover’ in data collection. As a related point, when I did not arrive at the beginning of the day or at the beginning of a shift (when I joined the ward round or a hand-over), I found it more difficult to pick up the thread of the day’s ‘stories’.

## **Summary**

The quality and credibility of ethnographic research can in principle be enhanced if a thorough approach to data collection is taken, recording notes at a low level of inference and reviewing them at regular intervals. I adopted the philosophy of ‘subtle realism’ for this thesis: asserting that the data are ‘real’ in the sense that the phenomena to which they refer occurred independently of the data collection.

I adopted the theoretical perspective of ‘practice theory’ on the basis of its usefulness in interpreting my data. This perspective provided an appropriate background to the empirical analysis I have developed. However, I want to assert that my findings are not a purely ideographic description of ICU. Generalising from qualitative research is in principle possible, and, indeed, necessary if we are to adopt a fallibilistic approach to research which can build on earlier sociological work.

The processes of gaining access and acceptance in ethnographic work are personal, social, political and ethical, and data collection can be affected by the physical layout of the site of analysis. The subject of the next five chapters is the ICU as an object of analysis.



## Chapter Four

### A Day in the Life of ICU

In contrast to the popular representations of ICU I mentioned at the beginning of this thesis, *Bluff Your Way in Doctoring* (Keating 2000: 48-9), had a rather irreverent portrayal:

#### Intensive (Expensive) Care Unit (ITU<sup>1</sup>)

To the uninitiated this is like walking into NASA by mistake. Somewhere under a mass of plastic tubing and electronic gadgetry is the patient in your care... Be prepared for even your most rudimentary medical knowledge to desert you as you cross this hi-tech threshold.

The serious point underlying the humour is that medical work, in this context, is concerned with material artefacts (“electronic gadgetry” and high technology) at least as much as ‘treating’ human bodies. In consequence, “medical knowledge” is regarded as irrelevant to even a medically-trained outsider. The word “threshold” is also indicative. Unlike most hospital wards, access to ICU is closely guarded, with videophone and keypad entry. I was informed that this was mainly for reasons of ‘security’, preventing thefts of nurses’ and visitors’ bags, but it also conveys a sense of the locale as hygienic and sterile, since on entry to an ICU all visitors are required to remove outdoor clothing and wash their hands.

Another counterpoint to the rather serious popular image of ICU was noted by the playwright Alan Bennett. He described visiting a friend in intensive care in terms which capture its bustle and informality:

Intensive care, although the busiest and most fraught section of the hospital, is also the most carefree. Though everyone has so much to do, dodging round each other in their green pyjamas like Olympic gymnasts, they all have time to stop and explain what it is they are doing. There are no obvious signs of rank. We were told we could wave at R. through the glass by a young man in green

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<sup>1</sup> ITU: Intensive Therapy Unit. The term ‘ITU’ is used less often than ‘ICU’ and they are basically synonymous. The only reasonable explanation for a difference in nomenclature is that as medical staff became involved in ICUs they wanted to emphasise that their work is *therapeutic* and not ‘just’ *care*.



who might have been a nurse, a doctor, or just someone there cleaning the floor. The Consultant himself is in shirt sleeves and pullover and looks as if he might have come in to adjust the radiators... (Bennett 1997: 230-231)

The 'green pyjamas' Bennett refers to are 'theatre greens' (that is, the same clothing as worn in Operating Theatres), which tend to be worn by all staff except Consultants (in some ICUs 'theatre blues' are worn). The wearing of these brings out ICU's historical, organisational and educational connection with anaesthesia and the Operating Theatres, as well as the sterility and need for hygiene. That "everyone [is]... dodging round each other" also paradoxically indicates the comparative spaciousness of ICU: in general wards there is less room for movement.

### **Initial impressions**

My own first impression of ICU was that it was separate and cut off from the rest of the hospital. In fact, it felt unwelcoming:

The first impression of the unit is one of intimidation. There are notices on the door about what you must do when you are inside. A nurse buzzed while I was still reading the notices on the door (I'd been there about 30 seconds). She wanted to know who I was... (I later realised that there is a closed circuit TV with a picture above the Nurses' Workstation, visible to the whole ward). I said I was there to see "John Brown" (the name of the Clinical Director - I later learned that he is known as "Dr. Brown" by all the staff). She came and let me in, then she buzzed Dr Brown's secretary. I was ushered out and down the corridor to his secretary's room. While I was waiting at the Nurses' Workstation I was noticed, and felt like a stranger: possibly unwelcome, and I certainly felt a little uncomfortable. Of course, it may be that that was because I had called the Clinical Director by his full name without the epithet 'Doctor'. (County, visit 1)

On a later occasion I noted the full text of the notice on the door:

"Press buzzer. Please wait, if we are busy it may take some time. Please remove outdoor jacket, wash hands and put on an apron. We may be some time if we are attending to your relative." (County, visit 3).

Although this initial impression was no doubt exacerbated by my own nervousness in commencing the study, the notion that the ICU is in some way separate, or cut off, from the rest of the hospital recurred throughout my periods of data collection. Strauss and colleagues (1997[1985]) described a hospital as a collection of "variegated workshops"; the ICU is a workshop behind a securely closed door.

Alan Bennett observed the informality among ICU staff, and his own inability to



distinguish profession or 'rank'. Often the ICU nurses and doctors are fairly indistinguishable, in theatre greens or blues, but it becomes apparent which are which as the nurses stay close to one patient whereas the junior doctors tend to follow a Consultant and move around the ICU. Most Consultants wear 'shirt sleeves'<sup>2</sup> most of the time (ICUs, like hospitals in general, are warm environments). ICUs did tend to be quite informal places, but a telling example (in Urban) of the different professions was in the different rooms for medical and nursing staff to take their breaks. The 'Staff Room' was for the nurses, used for their hand-over meetings and breaks, and notices advertising meetings for nurses were put up in here. The 'Seminar Room' was for the doctors, used for their hand-over meetings and breaks, and medical journals were kept in this room. There was, though, some overlap in the use of these rooms, especially at weekends and at times when the unit was less busy. This finding is similar to D. Hughes' (1980: 69): at night, in contrast to daytime, A&E doctors and nurses would congregate around tea and coffee making facilities. Another indication of the more relaxed atmosphere at weekends was that Consultants tended to wear polo shirts rather than shirt and tie. Urban ICU was the one which was noticeably the *least* formal in its general working atmosphere. Conversely, the ICU at Metropolitan was much more formal, but notionally had one (large) coffee room, shared by doctors and nurses. This was used for the nursing hand-over meetings and breaks. But hand-overs were still separated: the doctors usually handed over on a walking ward-round or in an ICU office, so despite sharing rest facilities the separate occupational groups could be readily distinguished.

A further difference in space utilisation between doctors and nurses could be discerned in where they left their personal belongings. Nurses took their bags with them to the patient's bedside (indicative of the space around each ICU bed and the territory nurses feel able to mark), whereas the doctors left them in a separate room: either the 'Seminar Room' (as at Urban) or in a room set aside for the doctors on call (at Metropolitan). There was evidence pointing to not only the distinctiveness of the hierarchies in terms of the physical locations members of each profession inhabited, but also the ways in which they related to areas of the hospital outside the ICU. In general, the Staff Nurses did not need to have a general awareness of the situation outside of the ICU:

A Staff Nurse answers the phone, then puts it down and says: "Have we got any cancelled operations? How would I know?" (Urban, visit 9)

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<sup>2</sup> A generic term I use to emphasise the informality of the dress. When ICU doctors were not wearing 'theatre' tunics the men tended not to wear jackets; women tended to wear trousers with a blouse.



However, the ICU Consultants often had an office away from the ICU, and invariably had duties other than ICU to cover at other times. This could be clinic sessions (for the physicians); theatre sessions (for the anaesthetists), research (which was the case for most of the Consultants at Metropolitan), teaching (not just the Consultants, and not just at Metropolitan) or private practice (unusual but not totally unknown). The physical space of the ICU is not the only place for Consultants' routine work, whereas for the nurses (and junior doctors) it is. Furthermore, doctors sometimes did not know who Senior Nursing staff were: in one instance a junior doctor, on answering the phone, had to ask a nurse "Who's C?" - C was in fact the Nurse Manager for the ICU, but she had not recently undertaken clinical duties on the ward. In another instance, when I said to a Consultant that I was going to discuss my research with the Divisional Nurse Manager, the Consultant had not heard of her.

But there were also many examples of informality and banter between the occupational groups and grades. For example, on one occasion, the Sister in charge of the afternoon shift was held up in traffic. By her own admission this nurse was forthright in giving her opinion ("we [ICU nurses] tend to speak our minds" – a good example of the self-perception of ICU nurses, similar views were expressed to me more than once). The Consultant on duty was informed of this while he was in the Staff Room, taking a break along with a couple of the nurses (it was a Saturday):

L (Consultant): "well, won't she be calm and relaxed when she comes in?" One of the nurses commented 'It's all right – we'll be either side of her and be a calming influence.' ... When [the Sister] arrived she certainly let everyone know her frustrations with her journey. (Urban, visit 6).

There were also a couple of examples from Metropolitan:

Consultant M: "We've got five minutes before 'Storm Trooper' E insists we start the Ward Round". E (Sister) comes through, and says "Five minutes..." (Metropolitan, visit 10)

[Ward round] L (nurse) said "I spoke to the patient about his medication". The doctors looked surprised (the patient appeared to be comatose). Consultant B looked at the patient and said "You spoke to the patient? We are not worthy!". L commented on the differences between doctors and nurses: "you see, nurse: speak to patient; doctor: ignore the patient". (Metropolitan, visit 9)

At times the ICU can appear to be extremely busy. The general activity level rises dramatically around the time of a new admission. I was almost overwhelmed by this when I first observed a new admission to ICU:

A brain stem death test was about to be done, but the Consultant was called off



suddenly to check on a potential new admission...

[Later] The new admission is conscious, breathing with a ventilator but not intubated. D (SpR) is performing some medical procedure; he raises his voice when doing so. He comes back over to the Nurses' Workstation and explains to me: "Sometimes you have to be cruel to be kind. I mean, which bit of 'do not move your foot' do you not understand?" A lot of administration has to be done because of the new admission, and impressionistically, the place turns into a real 'hive of activity', centred on the Nurses' Workstation. In amongst this activity, the Senior ICU Technician speaks to the Ward Clerk: 'Four computers are to be transferred to the IT department or the skip! – it's urgent'. A nurse asks an SHO to sign a form: "squiggle a signature here". D says, to the two SHOs: "Is there anything we haven't done yet folks?" He is looking through the notes, transcribing notes relevant to intensive care, from the 'Medical notes' file into a separate ICU folder. He says to me "I hate these ones who have been in ages". F, one of the SHOs, is at the Nurses' Workstation, on the phone. She puts the phone down. D says: "What did she say?" F doesn't answer straight away. D becomes more insistent on wanting to know the content of the phone call, even when he is interrupted by a nurse asking something. "Hang on", he says to the nurse; back to F: "What did she say?" F answers: "she's busy, she'll read the report and get back to us." D: "Fine." He turns back to the nurse: "OK". Someone speaks into one of the three phones: "Porter please, ITU". The Ward Clerk, filling in a form: "Where'd she come from?" Someone said the ward name, without reference to any notes. "Who's she under?" The blood samples are all placed at a special place by the Nurses' Workstation. A porter comes and collects them; I noticed no acknowledgement either from him or to him. The Technician asks the Ward Clerk something, who disappears. The Consultant returns. D is still abstracting relevant 'intensive care' details from the notes in the medical file. There appears to be quite a lot of sifting. D seems to be wondering, trying to make sense of it. He says to me: 'getting the notes is a kind of puzzle - or series of puzzles. Detective work, a precis'. The doctors also talk about the 'social history' of the patient. The Consultant looks at x-rays for the new admission with the two SHOs. (County, visit 2).

This all seemed to me fairly chaotic activity, but everyone had well-defined jobs to do. Initially, a potential new admission was regarded as more important than performing a brain stem death test. When the admission occurred later, there was a massive amount of administration – setting up ICU medical notes (a 'kind of puzzle'), filling in forms and setting up the computer-based information. In addition to referring to recorded information (medical notes, x-rays), there was also a large amount of information exchanged verbally both for clarifying matters of fact and to confirm with colleagues that 'everything's been done'. Telephone calls were made to other parts of the hospital, which initiate other processes (*e.g.* porter coming to collect blood samples, a brief telephone conversation with someone who will 'get back to us'). On top of this administrative work, the patient herself had to be 'looked after'. In the meantime, other work on the ICU continued: a nurse needed a signature, the technician needed to 'transfer' some computers.

The appropriateness of intensive care treatment for this patient was surreptitiously questioned by junior doctors and nurses, who commented that 'the patient is self-



ventilating', so should not have been admitted (I discuss this issue further in chapter five). This indicates two further characteristics of intensive care as regards patients. First, patients in ICU usually have "potential or established organ failure [and the] most commonly supported organ is the lung" (Smith and Nielsen, 1999:1544). Second, given the need for respiratory support and the likelihood of further organ dysfunction, patients are usually heavily sedated (hence the junior staff's comments that as the patient was *not* sedated she was not an appropriate ICU admission). That most ICU patients are not breathing by themselves, and are not conscious, renders them more like asocial bodies than is the case for most hospital admissions. For this reason, the interaction between ICU workers and patient's relatives becomes crucial (as I discuss in chapter seven).

ICU was not a 'hive of activity' all of the time and sometimes – particularly at night – it felt painstakingly sedate. My initial impressions were that the ICU is separate and cut-off and usually controlled, but sometimes appeared to be 'organised chaos'. In the following three sections I present a composite account of '24 hours in the ICU' to illustrate work and activity in ICU, providing a backdrop to the following chapters of empirical analysis. The detail of the specific routines were slightly different from unit to unit.

### **Early morning**

Even for a '24/7 service' like intensive care, it is clear that the working day begins between 7am and 8am (for doctors, 9am at weekends). In this section, I present times and specific (although anonymised) incidents to emphasise the regularity of the work: the precise times of events become much less regular, scheduled or routine throughout the rest of the day, until the early evening.

At 6.30am I arrive at the entrance to the ICU at the same time as Liz, the SHO on night duty. She comments 'you're up early': indeed, it is rather early for me and I am unable to formulate a witty response. She says she had managed to get a reasonable amount of sleep last night, and is now about to perform the last few duties before handing over to a colleague. As I walk on to the ward, I say hello to Gill, a Staff Nurse, who is sitting outside the ante-room of a Side Room. "I hate this time", she says. Steve, another nurse, is in another Side Room: he is watching the breakfast news and comments on it.



The nurses on the open part of the ward are gathering at the Nurses' Workstation. Sarah, the Night Sister returns from the female changing room: "Liz is just putting her make-up on. She'll be here in a few minutes."

When the sun starts to come through the windows, the nurses open the blinds, and one of the nurses switches on the main lights. A few of the alarms start to go off as some of the less sedated patients wake up in response to the light. When this happens the nurses say 'good morning' to the patients, switch off the alarm, remind the patients where they are, inform them that they are going to brush their teeth or give them a shave.

By 7.25am all the nurses are at the Nurses' Workstation; one of them say to me "it's the end of the shift lull" – they are waiting for the early shift to come on, who in turn are in the Staff Room, waiting for the main hand-over at 7.30am. This hand-over can be as short as five minutes, but usually takes about two minutes per patient. The Senior Nurse for the night shift presents, uninterrupted, a summary of each patient's situation, and the nurse in charge of the next shift then allocates the nurses to patients. There has to be enough time left for the individual hand-overs to occur before the night shift nurses leave at 8am, and for the Senior Nurses to exchange information (for example, whether there are enough nurses for an upcoming shift, that a CT scan has been booked for a few days hence). At the beginning and the end of their shifts the nurses write notes and complete an 'ICU Evaluation Form', summarising the information from the shift (see chapter seven).

At 7.45am Mr Peterson (a Consultant Surgeon) presses the door-buzzer. One of the nurses lets him in. He spends five minutes at the bedside of the patient he will be operating on later today and asks the nurse a couple of questions. He does not write anything in the notes: the Ward Clerk tells me that she thinks he should have - later the doctors agree ("that's damn rude", says one). He has left the unit before any of the medical staff have seen him.

At 8am the Clinical Director comes in and says "James [another Consultant] will be here in five minutes." Several Consultants come in and start the day with a cup of tea in the ICU even when they are not on duty that day. The doctors' hand-over takes place from about 8am to 8.30am, either in the Seminar Room or on a 'snaking ward round'. They discuss the treatment plan for each patient, plans for discharging patients who are



recovering, whether any patients have died (and if they need a Coroner's Report), whether there are there any new admission today (planned or emergency), whether emergency referrals could be accommodated. The Consultants think about prioritising treatment, which is partly dependent on the nursing staff (skill mix and numbers) – this can necessitate the Consultant, Senior Nurse and perhaps one or two of the Staff Nurses having a quick discussion.

## **Day time**

After the doctors' hand-over, the Consultant, accompanied by junior doctors, visits each patient, often prioritising the 'sickest' (as flagged up by the hand-over). Patients in ICU are almost all mechanically ventilated, usually by a tracheostomy. There are all sorts of tubes and wires going into and out of the patient for routine physiological monitoring (heart rate, blood pressure, blood oxygenation, breathing rate), for infusion of drugs, fluids and food, and for bodily waste (there is a catheter for urination). Some functions are monitored continuously on screens above the patient, some are recorded every one or two hours; for others daily readings are returned from hospital laboratories. Medical treatments (for example, giving drugs) also adds tubes to the patients; when patients require dialysis (daily or every two days), another set of tubes is attached to the patient. There are occasional bleeps from machines; when this happens the nurse will look intently at the reading which caused it (which will be flashing) and then switch it off. The main noise on the unit is of clatter and chatter.

All morning the unit feels busy, as visiting teams of physicians and surgeons come in and examine patients, either on whom they have operated or for whom they are expecting to take over care. Other Consultants may also visit, providing specialist advice (a common, routine example, are microbiologists). Non-medical routine visitors include a team of physiotherapists and a pharmacist (who checks on prescriptions). A radiographer with a portable x-ray machine is another frequent visitor. Everyone has to go behind one of the walls when an x-ray is taken. This can be delayed if a nurse is in the middle of something tricky or an alarm is going off. Non-clinical workers who come on to the ICU include porters and various grades of hospital administration.

At various times during the day the senior staff (Consultants, especially the Clinical



Director, and the Nurse Manager) might have to attend various administrative meetings (one example was a meeting about new flooring for the ICU). These grades of staff would also make contingency preparations for 'serious public incidents', for example a bio-terrorist attack or crowd control problems at major public events.

In general the junior doctors and nursing staff wander around, getting minor pieces of equipment and drugs or taking blood samples to an analysis machine. As nurses take their breaks, pop to the loo, or go to the stores (located within the ICU), they mention it to a nearby nurse so they can "keep an eye on", or "keep an ear out for", their patient. They need to perform regular checks on equipment at the patient's bedside, and on equipment which is located on the unit (for example, oxygen cylinders and a resuscitation trolley). Close co-ordination is required between junior doctors and Senior Nurses, partly as a result of the way that work is distributed by the Consultants at the time of the ward round: both junior doctors and Staff Nurses are given things to do by the Consultants. The Senior Nurse must take responsibility for the activities of the Staff Nurse at the patient's bedside, whereas the junior doctors are given work to do directly, but often the two sets of tasks are inter-related. However, the junior doctors tended not to interact with the most senior nurse, the Nurse Manager, unless she had clinical duties as well as managerial ones.

At lunch time there is another nursing hand-over, but usually with fewer nurses as many work 'long days' (*i.e.* a twelve-hour shift). There is an increased complement of nurses for a couple of hours. There are fewer visits from non-ICU clinical staff in the afternoons, as they mostly seem to finish their visits to ICU in the morning.

Patients' relatives come in, or telephone, at all times of the day and into the evening. They are required to buzz at the entrance to the ICU, and the nurse, Ward Clerk or doctor who answers it announces their arrival and calls over to the nurse for that patient, to check that it is convenient for the relatives to come through. They are greeted by the nurse, who gives an update, chats to them and explains the pieces of monitoring or therapeutic equipment. The nurses ask the relatives to leave for a few minutes when washing or turning a patient, otherwise the relatives can sit by the patient's bed for long periods, or can take a break in a Visitors' Room.

The Senior Nurse has to ensure that there is an adequate complement of nurses for



the following shift or the following day. Sometimes the Ward Clerk assists by phoning the nurse bank or indeed “anyone they know”. In general, there is a quite detailed and involved planning, scheduling and *ad hoc* organisation regarding nurse staffing of nursing shifts, and this can take up a lot of time. At County, two nurses spent a couple of hours a week sorting out the staffing requirements. A notice board could show a list of dates available for annual leave or extra night shifts available, and there was often a ‘Request Book’ in which people named days they would like to be ‘Off Duty’.

The junior doctors and nurses must liaise about possible admissions and discharges, with the support and advice of the Consultants. For example, they may discuss which patient could be transferred to a ward; if the unit is short-staffed they think about strategies for delaying a new admission, or whether to ‘only take internal’ referrals, rather than intensive care patients from other hospitals (the creative and collaborative management by junior doctors and nurses in ICU is discussed in chapter eight).

There is a junior doctor’s handover sometime in the afternoon, depending on the particular shift patterns for the junior doctors. Later there was a final meeting with the Consultant, which was described to me by an SHO as “just making sure James [Consultant] won’t have to come in again”. There is always a residual possibility of being called back in, but Consultants understandably like to reduce the chances.

The normal appearance of calm control can rapidly change to an appearance of chaos. On a couple of occasions I left the unit basically through boredom; when I returned an hour or so later it seemed as if there was activity in every part of the ICU. At night, the ICU often felt distinctly monotonous.

## **Night time**

The night shift nurses come in at about 9pm; there is a full changeover of nursing staff. By this time the Consultant will often (but by no means always) have left or be in the process of leaving. A resident junior doctor will invariably stay around the unit until at least the ‘early hours’ of the morning. After hand-over, the night nurses tended to start their work for the next shift immediately. They have one long break over the night, so can usually find somewhere for at least an hour of sleep. Nurses are informed of the



end of their break by a hearty “Good morning” over the intercom. (When she’s done it, the nurse says “I hate doing that” – but still does it at the next ‘end-of-break’ moment). I was told that at the beginning of the shift each nurse would perform a range of safety checks on their equipment and plan their shift. For example, one objective to the shift might be to reduce a drug level by a certain amount. At night, the nurses were fully occupied with these activities for about three hours: I noticed that by about 12.30am the major tasks were done, so that the nurses who take the earliest break, starting at midnight, still had an extra half an hour of this work when they returned. Hourly monitoring and recording is then required throughout the night.

Once the beginning of shift activities have been completed, the nurses tend to gather at the Nurses’ Workstation. Unless a patient is particularly difficult (for example, beginning to wake up and being demanding, which was irritating to the responsible nurse), or being discharged, or a new admission was expected, there was very little else to do. Some activities I observed to relieve the boredom were: painting nails (to the express shock of other nurses); knitting; reading (a book on *Social Theory and Nursing Practice*); planning a dissertation or research project; checking websites for car prices; telling stories about awful patients; telling jokes; sorting shifts over the coming weeks. The junior doctors would join in these activities for a few hours, but on quiet nights would tend to leave at about midnight. I also saw a Senior Nurse and an SHO getting out their diaries at 4am to arrange a meeting to discuss a joint audit presentation, which struck me at the time as rather incongruous but is, I suppose, a feature of working shifts. Few other, non-essential tasks can be done: there are no central hospital administration nor supplies services and the hospital laboratories are closed. The junior doctors have various strategies for coping with night shifts, for example, trying to get some sleep on the last night on duty so that they can stay up the following day and get back into day-time waking. Such a strategy is generally not available to nurses since, apart from one long break, they are expected to be on duty for the whole of their shift until 8am.

Busy nights were caused by referrals to ICU, which necessitated excursions by doctor(s) and preparing for patient moves (discharging a patient to make space, as well as the admission itself) by nurses. One particularly busy night I observed three referrals: one from the Operating Theatre; one from A&E and one from a general ward. As I now discuss, these highlighted to me not only the way that ICU was part of the hospital organisation, but also the way that ICUs exist within ‘local networks’ of other ICUs.



Of the three patients referred that night, an emergency surgical admission was admitted from the Operating Theatre, which necessitated transferring a patient from ICU to HDU. This in turn required close liaison with the HDU nurses. The second referral had been admitted from outside the hospital to A&E. The ICU SHO went to see her, and said “she won’t survive ICU”, citing her weak heart. ‘Not surviving ICU’ struck me as an interesting turn of phrase. It seemed to be directed at the non-ICU doctors, who saw ICU as a solution for the patient’s problems. The ICU doctor, on the other hand, saw ICU itself as representing a potential problem: at least for some patients, the trauma of ICU should be avoided. I learned later that this patient died the following day.

The third referral illustrates inter-hospital networks and negotiations. A patient had rapidly deteriorated on a general ward. He had to be transferred to another ICU nearby, as by this time there were no available beds on ICU nor other patients ready for discharge. The patient had MRSA<sup>3</sup>, so a major issue for the transfer had been the putative need to place the patient in isolation in a Side Room. A Regional bed monitoring service originally said there were no ICU beds in the region, but several became available later in the night. (It was surprising to me that patients were discharged from ICUs throughout the night, but it is also possible that beds became available as patients died).

Three potential ICUs for transfer were contacted over the course of the three hours following the decision to transfer (the ICU Consultant had made the decision that the patient needed intensive care). One nearby ICU declared spare beds, but both their Side Rooms contained patients with infections. At a second ICU, the nursing staff were amenable to a transfer, but when their Consultant-on-call was telephoned he had denied that they had a bed. At a third ICU, there was a bed on the open part of the unit, and the staff were prepared to swap patients around internally so that the patient could be placed in ‘isolation’. The transfer had been agreed and arranged, but then someone “went off” in their hospital before the physical transfer had been started. This meant that at about 3am the ICU medical staff whom I was with called the original ICU and said “look, we need a bed, it doesn’t matter where” – so the patient would not be treated in a Side Room after all.

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<sup>3</sup> MRSA: methicillin resistant *Staphylococcus aureus* (the so-called ‘superbug’).



## Differences between ICUs

Thus far I have constructed an account of 'ICU' as a single entity. The rest of the thesis in general follows this approach, but in this section I want to highlight some differences between the ICUs I observed; these were mainly differences in 'formal organisation'.

In what appeared to be a function of size, I found that the organisation of the two professions within the ICU varied. At Urban, an eight-bedded ICU, the Senior Nurse took care of a patient; consequently a difference in the interaction between junior doctors and Staff Nurses or Senior Nurses could be distinguished only after I had gained some understanding of who was who within the ICU. At County, which appeared to be better resourced, the Senior Nurses were 'supernumerary' and there was more observable interaction between them and the junior doctors than between junior doctors and Staff Nurses. At the largest unit (Metropolitan, with around twenty beds), the Senior Nurse was again supernumerary and usually organised work so that there were also one or two supernumerary 'runners' – experienced nurses, not assigned to a patient, who would provide advice, fetch equipment and drugs, and provide cover during break times. Here there was even less interaction between the nurses at the bedside and the doctors, with the more experienced nurses on a shift taking responsibility for that liaison.

Regarding the medical staff organisation, in the smaller units the roles of Specialist Registrars (SpRs) and Senior House Officers (SHOs) were conflated, and they were on the same duty roster (so expected to cover the same kind of work). Here, the junior doctors worked independently of one another, covering different times. In contrast, in the larger ICU, the junior doctors' roles were much more distinguished, and there was a noticeable hierarchy within the medical staff, with SHOs 'reporting to' a SpR, who in turn 'reported to' the Consultant. Here, some of the SpRs were evidently regarded as very experienced, as the 'ward round' was divided into two, with the Consultant and one SHO visiting half the patients and the SpR and another SHO visiting the others. One SHO told me that he needed to spend about half an hour with each patient in order to gain enough understanding about their situation.

The larger the unit, the more the support services were located 'in-house'. For example, at Urban (eight beds), a medical equipment technician came in to check the blood gas



analyser weekly, whereas at the largest unit there was a team of three technicians. Furthermore, at Metropolitan there was a dedicated ICU Pharmacist (*i.e.* a Pharmacist who had no non-ICU responsibilities). For all the ICUs in my sample staff from other support services (for example, physiotherapists and dieticians) would appear each day, but they also had other areas of the hospital to cover. ICUs have evolved into extensive data collection areas also, and several staff at each unit were involved in this activity.

There was an indication of different workplace cultures (for example, the enactment of medical and nursing hierarchies) in the clothes that medical staff wore. At County, only the nurses wore theatre blues; as far as I could observe (in four visits) all the junior doctors as well as the Consultants wore ‘shirt sleeves’, and the Nurse Manager wore theatre blues when she was on clinical duties, but a suit on ‘management days’. At Urban, several Consultants sometimes wore theatre greens. One Consultant wore them all the time – he joked to me that it was a good disguise (I presume so that he would be less likely to be bothered by non-ICU junior doctors) – as did all the junior doctors and all the nurses. At Metropolitan, the nurses and junior doctors wore theatre blues; the SpRs and Consultants were in shirt-sleeves. Another indication of working culture was provided by a Consultant at County, who told me that he did not permit non-ICU staff to write in the medical notes – this is in contrast to the other ICUs where the Consultants expected visiting Consultants to write in the notes if necessary. I infer from this that this particular Consultant placed a particular emphasis on ‘control’ (of treatment decisions as well as of entry to the unit) than the Consultants at other ICUs. (All ICUs featured the establishment of control, a theme which recurs in chapters five, six and eight). My overall impression was that Urban was the least formal in working atmosphere and County the most formal – more so than the ICU in a teaching hospital. I spent more time at Urban and got to know the staff there better, which may have coloured my judgement.

The methods of nursing hand-over also differed between ICUs, and this again appeared to be related to their size. For the smaller units, the nurse at the patient’s bedside wrote details on ‘post-it notes’ for the hand-over, whereas at Metropolitan there was a computer print-out for this information. Furthermore, at the two smaller ICUs, which also tended to have a more stable complement of nursing staff, the allocation of nurses to patients was done in an *ad hoc* manner, with individual nurses volunteering for particular patients. After the Senior Nurse for the previous shift had given the run-



down, I noticed an element of competing for “interesting” patients and new admissions, nurses agreeing to rotate in and out of Side Rooms, and nurses volunteering to nurse patients they had nursed already. But at Metropolitan, a large unit, the Senior Nurse simply allocated the nurses to patients. One explained to me how she did this:

(1) Need of patient - technical skills, nurse’s competence and ability; (2) learning needs of the team - matching a nurse’s learning needs to the patient; if that’s not possible, provide support if possible by placing mentors nearby; (3) Agency [nurses] are an unknown quantity: in thirty second’s discourse you need to determine the competence level and allocate nurses accordingly. Some agency are ex-staff, some others are also well known. If they are not well known, and unsure about their competency, place them in an open area. One nurse in each ‘area’ is regarded as a ‘senior’: they can act as an informant for that area. If you can’t allocate like that, decide which of the two ‘runners’ can ‘keep an eye’. (Metropolitan, visit 13)

At Metropolitan, with a total nursing complement of about 140, the nurses were organised into five teams. I was informed by one of the nurse management team that each team had a different ‘character’: one exuberant, one loud, one quiet, etc. A junior doctor confirmed this, saying to another SHO one evening:

‘You’re on [nights] with line A, they’re great, they have parties at 5am. I always like being on [nights] with line A.’ (Metropolitan, visit 6).

A final difference I want to flag up at this stage, although it feeds into my analysis in chapter seven, is in the organisation of medical and nursing notes. At Metropolitan the main daily ward round was described as a “multi-professional ward round”, attended by nurses, doctors, the Pharmacist and sometimes the Dietician and a Physiotherapist. Here the medical and nursing notes had been unified. At County, the Senior Nurse joined the doctors on their ward round, whereas this did not happen at Urban since the Senior Nurse had responsibility for the care of an individual patient. At both County and Urban the medical and nursing notes were separate.

## Summary

In summary, there are large numbers of staff, especially nurses in ICU. ICUs are embedded both within the hospital and in local networks of ICUs, but are also separated from the rest of the hospital by closely guarded physical boundaries.

In the next four chapters I analyse medical and nursing work in ICU. For both sets of workers I am interested in how knowledge and technologies are used in practice. I start, in the next chapter, by examining aspects of ‘uncertainty’ in ICU medical work.



## Chapter Five

# Medical Uncertainty in the ICU: the Contours of Clinical Knowledge

In this chapter I examine medical uncertainty in the ICU, an examination which is oriented towards understanding clinical knowledge in practice. I exploit a logical connection between particular types of uncertainty and knowledge, and utilise my data on uncertainty to identify the salient aspects, for medical practitioners, of clinical knowledge in practice. The structure of this chapter broadly reflects the trajectory of my investigations: having initially observed many instances of ‘uncertainty’, I turned to the sociological literature on ‘medical uncertainty’. This is a theme which has endured (although has been contested) in medical sociology for over half a century. I then narrowed my analysis to two particular kinds of uncertainty which I identified as being related to underlying clinical knowledge.

I organise my data, therefore, into two broad categories of uncertainty: uncertainties in the formal knowledge base and uncertainties in patient treatment. The distinction is not a firm one, since many issues around uncertainty in medical *treatment* reflect uncertainties in the *knowledge base* of biomedicine. But how different kinds of uncertainty were responded to in practice led me to assume that the underlying knowledge is perceived to be different.

Responses to uncertainty took four basic forms. First, it could be managed through formal risk assessments and protocols, which indicates that medicine has ‘delegated’ (although retains control over) the knowledge about which there is uncertainty to other health care practitioners. Second, attempts could be made to manage uncertainty through extensive planning and contingency arrangements, which indicates that the knowledge about which there is uncertainty is regarded as properly within the realm of ICU medicine. Third, uncertainty could be managed through obtaining expert advice,



which indicates that the knowledge about which there is uncertainty is regarded as properly *medical*, but not in the realm of ICU medicine. Fourth, uncertainty could be ignored, which indicates that the knowledge about which there is uncertainty is not regarded as clinical or medical. These responses implicate the domains of knowledge which medical practitioners in the ICU regard as either within their remit (and thus to be managed) or not.

### **Early observations of medical uncertainty in ICU**

Early in data collection I was struck by the apparent ubiquity of uncertainty in clinical knowledge, practice and discourse. These perceptions struck me in two contexts: a formal teaching session and ward rounds. For example, in a teaching session I noticed that some aspects of the knowledge base of biomedicine remain uncertain, although practitioners have the sense that the knowledge base is in a state of development:

After 45 minutes [of a teaching session on the kidney], the Consultant discussed “our patients” who are not the “healthy beer-drinking, rugby-playing types”... What struck me most was the uncertainty and impermanency in clinical knowledge: “Nobody knows what the mechanism is...”... “It used to be thought that old people have renal failure as a function of their age, but those studies were done quite a long time ago, on unfit people, and now we realise that a healthy 80 year old can have a perfectly healthy kidney”. (County, visit 4).

On the same visit, during a morning ward round, actions performed the previous evening were couched as ‘wait and see’; either waiting for the results of tests taken earlier to be reported, or waiting for possibly ‘occult’ clinical events (as yet unknown or unidentified issues related to the patient’s condition) to become manifest. This led me to note, regarding patient treatment:

It seems to me that decision upon decision is contingent on a plenitude of factors. (County, visit 4).

Similarly, according to one informant I interviewed early in the course of the research, several aspects of ICU work were described as attractive because it is ‘uncertain’:

[What’s attractive about intensive care?] ‘Excitement – you don’t know what will happen next, what will come through the door; the variety (of conditions admitted); dealing with problems others have not been able to deal with.’ (Interview, Consultant B).

Such a comment is reminiscent of the professional pride of Casualty Officers, as reported in Jeffery’s (1979: 94) study:



unpredictability was often stressed as one of the... virtues of the Casualty job, and this covered not only the variability in pressure – sometimes rushed off their feet, sometimes lounging around – but also the variability between patients, even if they had superficial similarities.

‘Objective’ evidence confirms that for much of the time ICU staff do not know what kind of patient will be admitted next – over 80% of admissions to intensive care in the UK are unplanned<sup>1</sup>. The ICU practitioner’s desire for ‘interesting work’, associated with uncertainty (of ‘what will come through the door’), is something I observed several times. When there is not this excitement and uncertainty, ICU staff can become dissatisfied. For example, during one particular week of fieldwork, the staff were unable to transfer patients out of the ICU as the beds in the rest of the hospital were fully occupied. During that period I recorded many comments on how the work was boring that week, and complaints as to how the patients didn’t really need intensive care, they were “long term weaning problems” – such comments coming from both doctors and nurses. All this suggests that the perceptions of my informant on the attractiveness of ICU are generally held, and ‘uncertainty’, expressed as ‘interest’ or ‘excitement’, is an aspect of work which is valued by doctors and nurses in ICU.

Notwithstanding the frustrations when patients were ‘long-term weaning problems’, a view of ubiquitous uncertainty was apparently confirmed by one of the Consultants at the second ICU I visited, again early on during field work, during a discussion with the junior doctors:

L (Consultant) says “I can’t work out if [patient name] is getting better because of the treatment, [or] feeling better because of the treatment but not getting better, or is just getting better [i.e. irrespective of the treatment].” (Urban, visit 5).

Having noticed these instances of uncertainty, I examined the sociological and organisational literature. Whereas uncertainty in the organisational literature is often related to ‘optimising organisational structure’ (Donaldson, 1999[1996]), and can be thought of as the ‘unpredictability’ highlighted above, the sociological theme of uncertainty in medical training and work can be linked more explicitly to aspects of knowledge. Although they overlap, two main strands of uncertainty in medicine can be construed as uncertainty in the knowledge base of biomedicine (held to be especially relevant in regard to medical training) and uncertainty in medical practice (regarding all aspects of patient treatment). As well as these two broad categories of medical

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<sup>1</sup> ICNARC Case Mix Programme Database.



uncertainty, there are two contrasting traditions of sociological analysis. The first tradition is exemplified by R. Fox (1979[1957], 1980), who concluded that uncertainty can be regarded as an over-riding motif of medicine. The second tradition is exemplified by Atkinson (1984, 1995), who vigorously rejected Fox's interpretations, and argued that control and certainty are as much features of medicine as uncertainty. He commented:

it is necessary to pay rather close attention to *how* uncertainty or certainty are actually conveyed in the course of everyday medical work. It is not enough to account for these things in terms of generic and pervasive features. (Atkinson 1995: 117).

My discussion in the next section is informed not only by general sociological analyses of uncertainty in medical training and practice, but also by two sociological analyses of uncertainty in the ICU (Harvey 1992, 1996, Zussman 1992). Both these studies made the assumption that uncertainty is a predominant feature of intensive care. Harvey (1996: 85) commented:

uncertainty is endemic to medical practice [and] occurs in a particularly acute form in intensive care,

while Zussman took a similar view: "uncertainty is pervasive" (1992:117). Apart from this fundamental assumption, Harvey's and Zussman's approaches are markedly different, as I discuss once having reviewed the general sociological literature on medical uncertainty. I then examine two particular conceptions of uncertainty in the light of my own data. Following Atkinson's injunction, I analyse uncertainty in terms of its discussion, presence and how it is dealt with in practice, in order to identify which kinds of knowledge count as *medical* in the ICU.

### **Sociological conceptions of medical uncertainty**

'Uncertainty' as a concept in sociological studies of health care originated with Parsons' (1951: chapter 10) exposition of uncertainty in medical treatment, but the most famous example is probably R. Fox's (1979[1957]) classic study in the 1950s of "training for uncertainty".



## Uncertainty in medical training

In her analysis of students undertaking medical training, Fox identified two sources of uncertainty for medical students: the “incomplete or imperfect mastery of available knowledge ... [and] the limitations of current medical knowledge” (Fox, 1979[1957]: 20). According to Fox, the difficulty of distinguishing between these two sources of uncertainty is a third source of uncertainty. In their pre-clinical years, students learn to acknowledge uncertainty, eventually accepting that an “irreducible minimum of uncertainty is inherent in medicine” (*ibid.*: 24). In their clinical years students become “impressed by the diagnostic and therapeutic uncertainties” (*ibid.*: 44) they encounter. In response to this, Fox argued, students and trainees adopt a “manner of certitude” (*ibid.*: 37). All this implies that learning to cope with uncertainty at medical school prepares students for uncertainty in medical work.

In her later work Fox developed the concept of uncertainty, and the responses to it, in particular in regard to research wards with experimental treatments, which

furthered my appreciation of the emotional, moral, and existential implications of these types of medical uncertainty for physicians and their patients. To be puzzled, ignorant, unable to understand; to lack needed knowledge or relevant skill; to err, falter, or fail, without always being sure whether it is ‘your fault’ or ‘the fault of the field’ ... is especially painful and serious when the work you do is medical. For, however familiar and routine it may be... no medical action or interaction that involves a patient is trivial or completely ordinary. Below their medical scientific surface, medical acts and events intersect with the human condition of patients, their relatives, and of medical professionals themselves – their most profound aspirations, hopes, and fulfillments, their deepest worries, anxieties, and fears. (Fox 1980: 5-6)

This quotation indicates Fox’s move from regarding uncertainty as a specific concept in medical education and training to a rather more general – and dramatic – conception of uncertainty. As she noted, “the theme of uncertainty has appeared and reappeared as a motif in my research, teaching and writing” (*ibid.*: 2), and, particularly in her later writing, she appears to have regarded ‘uncertainty’ as a defining feature of medical work. The broadening out of the concept of uncertainty proved to be a controversial aspect of her work, receiving its most trenchant criticism from Atkinson (1984, 1995). Before examining those particular criticisms in detail I will discuss Light’s (1979) work which, although he originally built on Fox’s analyses, was subsequently re-interpreted as representing an alternative view (Atkinson 1984: 953, Timmermans and Angell, 2001).



Light (1979) identified five kinds of uncertainty in professional training and socialisation, which he maintained were encountered in a particular order for medical students and trainees. He enumerated these as uncertainty regarding: instructors; professional knowledge; diagnosis; treatment; and client response. He identified the responses as ‘psyching out’ instructors; mastering knowledge; acquiring clinical experience; emphasising technique; and maintaining a dominant relationship. Light maintained that the responses to these kinds of uncertainty are ordered hierarchically: each response incorporates the responses of the previous levels. The different responses of doctors-in-training to these different types of uncertainty were re-interpreted by Atkinson (1984) and Timmermans and Angell (2001) as representing “training for control” rather than “training for uncertainty”.

Atkinson’s (1984) paper criticised the whole idea of uncertainty in medical training and work. He maintained that the “treatment of uncertainty in medical sociology is inadequate and incoherent”, and the theme of uncertainty, as portrayed by Fox, was “too seductive... under-developed, and over-played” (*ibid.*: 949). According to Atkinson, control and certainty are as much features of medical training as uncertainty. His criticism had three main strands.

First, uncertainty as a general concept conflates several issues, including: a malaise manifested at the level of society; a feature of modern scientific medicine; a feature of professional medical work; and a cognitive and inherently emotional problem for medical students, trainees and practitioners (R. Fox 1980, Atkinson 1984: 951). In Atkinson’s view, therefore, there is an unhelpful reductionism: “a number of different issues are collected together and glossed under this single heading” (*ibid.*: 951).

Second, whilst acknowledging that medical students routinely face problems in learning, Atkinson argued that “it is far from clear ‘uncertainty’ is the sole or even the major outcome of this” (*ibid.*: 952), since students adopt pragmatic approaches to pass their examinations, which is their prime interest. So,

for the most part, in such contexts medical students are *not* occupied with radical doubts and plagued by uncertainty. (*ibid.*: 952).

Third, in medical work as well as in medical training, control featured as much as uncertainty. He maintained that

Personal knowledge and experience are not normally treated as reflections of



uncertainty, but as warrants for *certainty*. The primacy of direct experience is taken to guarantee knowledge which the student and practitioner can rely on. The distinction between ‘theory’ and ‘practice’ or between ‘science’ and ‘experience’ is not drawn in order to contrast ‘certainty’ and ‘uncertainty’. Both are ways of warranting knowledge for practitioners’ practical purposes. (*ibid.*: 953)

Atkinson’s criticisms have some force, but it is worth noting that Fox’s original studies on medical students were conducted over two decades before Atkinson’s. It is possible that medical students in the United States in the 1950s, the “golden age of medicine” (Freidson 1988), *were* genuinely troubled by their inability to distinguish their personal uncertainty from that of medical knowledge in general.

Overall, though, Atkinson’s analytical concern, that the concept of uncertainty be considered in respect of its counterpart – certainty – is worth heeding. He recommended that empirically detailed studies be done to develop an adequate representation of medical knowledge and experience. In a study a decade later Atkinson developed his argument, focussing on the discourse of haematologists in practice. Before discussing those findings I stay with the theme of uncertainty in medical training.

Timmermans and Angell (2001) reviewed and updated conceptions of uncertainty as applied to medical training, particularly drawing attention to ways that Evidence-Based Medicine (EBM) impacts on medical learning. They argued that EBM introduces a new subset of uncertainties which they termed ‘research-based’ uncertainties. This new uncertainty is introduced to medical students because most studies and systematic reviews are equivocal in their findings. In addition, trainee doctors had doubts about their own abilities to retrieve all relevant studies, their own abilities to evaluate studies, and the motives of those who conducted the original studies. Overall, Timmermans and Angell (2001: 349) argued that

Learning how to deal with the specific uncertainty of research thus led to a new kind of research-infused skill, an additional dimension of learning to doctor.

In their interview-based study of trainee doctors, they identified two sets of responses to this uncertainty, one which they placed as consonant with Fox (“uncertainty... the hallmark of medicine” - *ibid.*: 384), and the other which they placed as consonant with Atkinson and Light (“training for control closely follows training for uncertainty” - *ibid.*: 384). Whilst some medical trainees actively evaluated and critically interpreted



the literature, others would rely on review articles and protocols at face value. But both sets of responses resulted in a redemption of ‘clinical judgement’. Either (using ‘clinical judgement’) the critical evaluation of research evidence and protocols caused them to be adapted or ignored, or ‘clinical judgement’ provided an additional comfort when medical trainees felt overwhelmed by a morass of evidence. Timmermans and Angell further argued that EBM has restructured the knowledge acquisition by residents in training, and they introduced the concept of “evidence-based clinical judgement” to mark the way that EBM is incorporated into medical work.

Uncertainty has therefore appeared as a recurring theme in studies of professional socialisation and training. Responses to uncertainty have been construed to result either in dogmatism and control, or a kind of existential angst. In addition, an ironic consequence of EBM has been noted: that its incorporation into medical training has strengthened the perceived need for clinical judgement.

### Uncertainty in medical treatment

The second broad area identified for medical uncertainty was observed by Parsons (1951). In noting the “important area of uncertainty” within the limits of the “state of medical science” and the physician’s own assimilation of it (*ibid.*: 449), his argument was a prelude to Fox’s analyses. Parsons himself focussed on the “great importance” of uncertainty regarding treatment of individual patients:

Sometimes it may be known *that* certain factors operate significantly, but it is unpredictable whether, when and how long they will operate in the particular case (*ibid.*: 449).

So Parsons was writing mainly about the uncertainty of treatment effects in individual cases (patients). His view was that the ‘real’ uncertainty in medical knowledge about treatment effects is managed, in general, by an activist approach:

The physician himself is trained and expected to act, not merely to be a passive observer of what goes on (*ibid.*: 466)

Davis (1960) drew on Parson’s ideas, but commented that there was a danger in considering ‘uncertainty’ as an over-arching theme of medical work. Foreshadowing some of the concerns which were later to preoccupy Atkinson, Davis aimed to

temper to some extent the predominantly cognitive emphasis that the issue of



uncertainty has achieved in medical sociology, as if all that passed for uncertainty or certainty in the communication between doctor and patient were wholly a function of the current state of scientific and clinical knowledge. (*ibid.*: 47)

Davis further commented that as medical practice is an ‘applied endeavour’, there will always be probabilities and uncertainties rather than absolutes. For him the important question is the

the matter of degree and not the mere presence... if the concept is to have any analytical value at all, it cannot be applied to all instances of illness in which it is possible to concede the existence of some degree of uncertainty, however slight. If this were done, there would not be an instance to which it did not apply. (*ibid.*: 43)

Which is to say, analytically there needs to be some specificity to uncertainty as a concept. This is an important point, but we might also add that as well as *degree* there may be different *kinds* of uncertainty, as later discussed by Light (1979) and updated by Timmermans and Angell (2001). Davis’ own research had pursued the idea of prognostic uncertainty in medical work, and he analysed consultations between doctors and children with poliomyelitis and their parents. His analysis distinguished

between “real” uncertainty as a clinical and scientific phenomenon and... “functional” uncertainty [which] lends itself in the management of patients and their families. (Davis 1960: 41)

This second type of uncertainty allowed patient’s families to remain ‘uncertainly optimistic’ for a long period, even after the doctors themselves had a more certain – and pessimistic – view of prognosis.

Atkinson’s (1995: 150) detailed analyses of the situated talk of haematologists demonstrated the

complexity of clinical culture and talk. Neither uncertainty, nor over-confidence, nor dogmatism are all-encompassing features of medical knowledge.

Atkinson did not dismiss the concept altogether, but seemed rather to be concerned to explore it - in this case, how physicians talked about uncertainty. In this, Atkinson’s overall argument on the theme of uncertainty followed his earlier (1984) paper, and can be summed up:

there are many contexts in which uncertainty is not an issue for the actors, because they employ practical reasoning and action in such a way as to produce relatively unproblematic diagnoses and disposals. (Atkinson 1995: 114)

‘Disposal’ is fundamental to case-based work like medicine (as highlighted by Bloor’s



(1976) classic paper on ENT surgeons) and, as I found, the ICU is no exception. As I will show shortly, the organisation of work in the ICU involves making plans towards disposal, and is one way that uncertainties are managed.

### Medical uncertainty in ICU

For the context of ICU two contrasting analytical approaches to medical uncertainty have been taken, although both Zussman (1992) and Harvey (1992, 1996) assumed that uncertainty was ‘real’ and a predominant feature of intensive care. Zussman argued that uncertainty, as a pervasive feature of ICU, is exacerbated by the social organisation of medical work. He discussed prognostic uncertainty, and commented that, in the context of treatment limitation decisions,

What the physicians are looking for is certainty about a prognosis. But prognostic certainty depends, in turn, on diagnostic certainty.  
(Zussman 1992: 117)

He argued that diagnostic certainty clarifies whether a patient’s condition is reversible, a key criterion for both admission to intensive care and for deciding not to limit patient treatment. The perception of a patient’s prognosis may change while they are in ICU, but once treatment has begun physicians are less willing to withdraw, so “uncertainty leads the physicians down a road with no exit.” (*ibid.*: 119).

Zussman’s overall approach was explicitly in R. Fox’s tradition:

Uncertainty, as Renee Fox has observed, emerges, in part, from ‘limitations in current medical knowledge’... Such limitations, by themselves, would make the work of ICU physicians difficult enough. But to them are added uncertainties which emerge, much more directly, from the social organisation of medicine.  
(*ibid.*: 119).

He enumerated these ‘added uncertainties’ as: a hospital organised around an emphasis on familiarity with techniques rather than patients; being unaware of patient’s wishes; and a decision making processes which emphasised individual responsibility. This final ‘added uncertainty’ enables individual physicians to “insist successfully on treatment even when the entire ICU staff believes that treatment is pointless” (*ibid.*: 121).

I found comparatively little evidence to confirm Zussman’s analyses as *general* features of ICU, but this may not be altogether surprising given both Zussman’s specific



concerns (medical ethics and treatment limitation decisions), and the different medico-legal and social contexts. Notwithstanding his specific concerns, however, the view of uncertainty Zussman portrayed comes close to making uncertainty a motif for ICU: the approach to medical uncertainty which was criticised by Davis (1960) and Atkinson (1984, 1995).

Harvey's (1992, 1996) study was focused more specifically on uncertainty, and she extended Davis' (1960) conception of 'functional uncertainty'. In a critical analysis based on in-depth interviews with intensive care doctors, nurses and patients' relatives<sup>2</sup>, she argued that

both 'certainty' and 'uncertainty' in medical situations have significant socially constructed elements to them and... these are actively achieved by the deployment of strategies... related to professional power and social relations generally (Harvey 1996: 81).

Harvey argued that doctors defined the degree of 'uncertainty', which they managed towards 'achieved certainty'. This, she maintained, was an 'illusion of certainty',

the structured masking of uncertainty by the use and manipulation of medical iconography, artefacts and techniques to create the illusion of certainty... Technology is central to this management of uncertainty and accomplishment of control (*ibid.*: 81)

So although a degree of 'real' uncertainty was assumed in Harvey's analysis, her focus was on the power relationships between doctors and nurses and patient's relatives.

Inverting Davis' (1960) line of reasoning, she commented that for the case of intensive care, patient's relatives have the (incorrect) view that 'certainty' has been achieved, and that 'functional certainty' serves the managerial ends of doctors in their dealings with patients' relatives.

As I shall show shortly, I agree with Harvey that the practice of intensive care does seem to emphasise control rather than uncertainty. The focus of my study was not on interactions with patient's relatives, so I can not comment in detail on this type of 'functional uncertainty' (although in chapter eight I do identify a form of inter-professional functional uncertainty). In general, though, I take a different approach to Harvey. I examine the putative 'real' uncertainty in clinical practice in the ICU, as recorded in everyday clinical work, and provide an interpretation of the responses to it.

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<sup>2</sup> Harvey's research was also ethnographic in that she undertook periods of observation on ICU, but all the data she presented were from interviews.



In summary, a range of ‘uncertainties’ have been delineated for medical work. In my early fieldwork I identified ‘unpredictability’ and a research-based uncertainty as new findings appear to call into question previously accepted knowledge. ICU medical practitioners claimed that some aspects of clinically relevant knowledge are not known at all, or that they did not know what was happening in a particular case. Sociologists (most famously R. Fox) have identified uncertainty in the knowledge base of biomedicine, in an individual’s learning, and in the difficulty of distinguishing between these two. With regard to the knowledge base of biomedicine, sociologists have identified that new uncertainties have been introduced as medical trainees attempt to incorporate EBM into their practice. With regard to individual knowledge, the difficulty of applying knowledge to particular situations can be regarded as uncertainty, and uncertainty has been analysed in terms of individual patients’ prognoses, diagnoses and treatments. Making prognoses has been analysed in a social constructivist tradition, with the theme that uncertainty (or certainty) are used by practitioners in their dealings with patient’s relatives.

In my analysis, I focus on the way that two broad categories of uncertainty were dealt with amongst health care providers in the ICU. I examine firstly whether, and how, putative uncertainty in medical knowledge affects work in the ICU, and then discuss the management of uncertainties in the medical treatment of patients. The purpose of this analysis is to explicitly relate ‘uncertainty’ to situated knowledge, and thereby to comment on the salience of different types of knowledge to medical practice in ICU.

### **Uncertainty in the knowledge base of medicine**

Following R. Fox, ‘uncertainty in knowledge’ can be divided into two parts: the uncertainty in the knowledge base of medicine as a whole, and the uncertainty in an individual’s knowledge. But, at least for the case of ICU, the response to both these sources of uncertainty is basically the same – practical solutions are what matters.

During the ward round, Consultant G: “No-one understands the physics of high-frequency ventilation [all we know for sure is that it’s something to do with] the increased surface area... that was one of the few things I learnt at [teaching hospital]”.  
(County, visit 2)

Not only is it claimed that the doctors are using medical technology which they do not understand, but it is also claimed here that the ‘basic physics’ enabling the technology



to work is not understood in a general sense. But this lack of biophysical understanding is irrelevant to all intents and purposes – all that matters is that the “black box” works and that the treatment of the patient has some clinically beneficial effect.

It is commonly asserted that ICU treatments have a poor evidence-base, for example:

D (SpR) tells me that the main problem with Intensive Care is the lack of trials, and lack of evidence about treatment (County, visit 3).

However, in practice this ‘lack of evidence’ appears not to be a problem. The current generation of Specialist Registrars have been brought up on evidence-based medicine, and it could be assumed, as the quote above indicates, that they are therefore concerned about the ‘lack of evidence’ for treatments. But in the context of everyday ICU work, there is, rather than concern, a combination of assertion and reliance on more experienced practitioners, who seem to have a better-developed understanding of particular clinical situations. Assertions about the inappropriateness of intensive care treatment was transformed once a consultant confidently either admitted a patient (as in the first example below), or directed treatment for a patient for whom intensive care was considered unnecessary (as in the second example).

A new admission has been called a “crumbly” [patient inappropriate for intensive care]. The comment (from the junior doctors and nurses) is that ‘the patient is self-ventilating’, so why is she being admitted? Some time after this patient comes in, and he’s discussed it with the consultant, D (SpR) explains to me that she might be in renal failure, but they do not know that for certain: it takes some time to tell whether the failure is reversible or not. (County, visit 2)

Note here also that another source of uncertainty – whether the patient has kidney failure – is dealt with by keeping the patient for observation in the ICU. But even the uncertainty in an individual’s knowledge, which Fox found was pertinent to medical student’s perceptions, is not apparent for the less experienced and junior staff. Their primary reaction was initially to criticise implicitly the decision to admit the patient, until the reasons for the decision to admit were explained. The junior staff’s original assessment was certainly wrong.

In the second example, we visited an ex-ICU patient on a general ward, following a phone call in which the nurses on the ward had asked whether she could be referred to ICU (a request which should have been made by the doctors now responsible for the patient):

[Friday evening] D (SpR) is being quite strict on the phone – “it has to go from their boss to my boss” [i.e. Consultant to Consultant referral] – but he decides to go to the ward. I went with him and on the way he explains to me that “you need firm



boundaries” otherwise people can fall between two stools... We got to the ward where the patient who had been ‘referred’ was. She was in a side room, awake. He turned to me and said “bottom line, does she look well?” I was a bit stunned by this inclusion in the conversation about the patient, and stammered “I don’t know, you’re the doctor”. D: “Does she look as ill as the patients [in ICU]?”...

(Back on the ICU, 10.30pm) ... B (Consultant) arrived... He asks D “What else is going on around the place?” G mentions the ‘referral’ we had been to see earlier... B then looks up on the electronic hospital records - the patient had been admitted to ICU for one day a month ago... B writes down things as he searches on the computer.

(11.25pm) I went with D and B back to the ward. When we arrive, B says “there could be something funny going on”, but the problem that he suspects she has is not common. D (SpR) asks a few questions about it. B reads the notes, looks at the patient, “She looks like she’s in pain” (the patient is asleep). D then explains to me that there is a “recognised metabolic problem” related to the surgical procedure she has just had. B starts writing in the Medical Notes, takes about five minutes to write about one paragraph - he seems quite thoughtful as he does so, then speaks to the Staff Nurse. He tells her that they have to ‘keep up the bicarb for at least 36 hours’. He makes some fairly barbed comments about having told ‘them’ (i.e. the doctors now responsible for this patient) about the problem currently manifesting itself when she left intensive care about a month ago: “This is all fairly standard stuff”. The nurse, rolling her eyes, agrees - basically that the doctors looking after the patient aren’t doing the job properly! It seems to me that B is very sure and confident about what to do next. He asks D to check it on Sunday morning, and says ‘I’ll be back... on Sunday afternoon’. Later he says to me that the patient has been ‘referred’ to ICU because it’s a Friday, and “someone wants an easy weekend”. (County, visit 3).

So, to begin with D (the SpR) characterised this referral as a ‘semi-referral’ and an organisational weak-spot, where a patient can fall between two stools and they (the ICU, or the hospital, or both) could get in legal difficulties. His view was clearly that the patient was not a case for ICU. His opinion on arrival at the ward did not change much – he even asked a nearby ethnographer whether the patient was ill, suggesting that her appearance was enough, even to a lay bystander, to show that she did not need intensive care. The Consultant, however, obviously drew on his local knowledge and memory in the first instance. He remembered that the patient was admitted to ICU a month ago, so checked the hospital computer system.

In terms of general knowledge, it is interesting how the apparent problem shifted during the second assessment visit. To begin with the Consultant said that “there might be something funny going on”, a problem which I was led to believe that was “not that common”. This became a “recognised metabolic problem”, and by the end of the visit it was reported as “all fairly standard stuff”. It is the more experienced practitioner who can transform the manifest problem more confidently by reference to both his own local knowledge and, apparently, general understanding of biomedical mechanisms.



The impression may be that ICU Consultants are supremely confident, breezing around the hospital routinely rescuing patients from poor treatment, identifying problems and their solutions. However there were occasions where the ICU Consultants apparently lacked the necessary ‘specialist knowledge’, and either sought advice from other specialties, or shared clinical responsibility for a patient. This did not necessarily help to resolve uncertainty, as in the following two data extracts, which concerned one patient:

[Ward round] A Consultant in rheumatology comes in. ICU Consultant B: “Hello H... We’ll come to your chap in a minute...” [To Bed 18, out of order]. Rheumatology Consultant H: “Prognosis guarded. Very unusual case [names disease]: only ever seen 18 men, 350 women. Highly unknown. Can’t go to textbooks. Never seen. Mobilise – good idea. No EBM.” Just after H left, B said: “If [that patient] leaves hospital he’ll be doing well.” (Metropolitan, visit 5)

[Ward round]. Consultant M: “Bed 18 [names patient] . Got a few problems. Wish I understood what the microbiologist was saying to me this morning, then I’d be even more concerned. Why the fluid overload?” (Metropolitan, visit 10).

The question ‘why the fluid overload?’ was directed at no-one in particular: ‘thinking out loud’. It is the case in both these examples that the requisite knowledge was beyond the reach of both non-ICU and ICU Consultants. But, for whatever reason, the ICU Consultants did not seem overly concerned. The first gave a rather off-hand “if that patient leaves hospital, I’ll be very surprised”; the second purported not to have understood what a microbiologist had told him.

The data thus far have suggested three categories of responses to uncertainty in the broad knowledge base of ICU medicine. First, detailed knowledge of particular biophysical mechanisms is not considered relevant: a technology works, how it works is not important. Second, decisions may be made with confidence, although these may equally be overridden (a Consultant can transform a problem into something that ICU can deal with). Third, uncertainty might remain after discussion with ‘experts’: but the remaining issues do not seem to be regarded as at all problematic, and the attitude seems distinctly pragmatic. The data above have also provided hints of a rather casual approach to making prognoses, which I now analyse more closely.



## Prognostic uncertainty

I found that a relaxed attitude to prognosis was widespread, with doctors (and nurses) giving candid views about their expectations regarding particular patients' ultimate outcome (to each other and in my presence – not, so far as I am aware, to patient's relatives). An important point is that prognosis only seemed to be important when patients are being admitted or (inevitably) when decisions are being made about limitation of treatment. There are numerous examples in my data of a confident view, once a patient is in the ICU, about their poor prognosis. This is most commonly expressed as “[she or he] is not going to do”. There were other indications of poor prognosis, from nurses and junior doctors:

Nurse hand-over: K (Senior Nurse) said of the patient in bed 3: “he’s very sick, he looks ghastly, in fact he looks like a corpse”. (Urban, visit 3).

M (SHO) says to me ‘the patient in bed 3 is stuffed. Liver’s knackered. He looks 60, he’s actually about 35’. (Urban, visit 3)

Junior doctor’s hand-over: N (SpR) and P (SHO). N: “I’ll give you a quick run round, anyway, [Side Room]... he’s still fucked” ... ‘Not suitable for theatre. Symptomatic treatment. Fair chance die, whatever.’ (Urban, visit 8)

Regarding the first data extract, the nurse later explained to me that if I had not been present at the hand-over she would probably have been even more blunt about the patient (she told me she would have said something like ‘Oh my God, he’s going to die’). There were also occasions where doctors were not just certain about death: on a more positive note they expressed certainty of patient survival:

P (SHO) is at the new admissions’ bed. The heart rate monitor apparently shows zero, he adjusts the scale on the monitor. “Heart rate of zero, methinks not... He’ll be all right, this bloke.” (Urban, visit 24).

Sometimes the need to provide a prognosis was affected by the concerns of the patient’s relatives, where my own data touch on Zussman’s (1992) study. But whereas Zussman commented that certainty in prognosis depends on certainty in diagnosis, and he seemed to assume a straightforward relationship between the two, I found that the relationship between prognosis and diagnosis unclear:

[Side room] Consultant R: “What about the family?” Nurse S: “They’re coming to terms with it - hoping for a miracle. They have a story about a grandmother who recovered when treatment was withdrawn, and lived twenty more years.” Consultant R: “There’s clearly no hope of recovery... I’ll speak to relatives if necessary”. S: “Just mentioned to daughter-in-law, just prolonging it really”... R: “You know the family well?” S: “Yeah, I do.”...

[Later] S comes to speak to the Consultant - the relatives wanted a diagnosis, they were saying that you can’t stop treatment if you haven’t got a diagnosis. R shrugs his shoulders; S said that she had told them that the diagnosis was ‘heart failure’; R



basically agreed. (Urban, visit 15).

The diagnosis is plainly important to the patient's relatives, but not for the ICU doctors and nurses: the patient is strongly expected to die, but the diagnosis is hardly relevant to their concerns of either prognosis or treatment. On another occasion, the diagnosis marginally informed patient management (increasing the dose of a drug the patient was already receiving), but had little bearing on prognosis:

(Bed 1): Consultant R has had a discussion with the relatives. The nurse asks about the relatives "were they all right?" He said he painted a 'black-ish picture'... T (SpR): "Would you consider filtering<sup>3</sup>?" R: "Yeah, but bottom of the list. We're winning on the base excess at the moment. If not winning when he's filled then can start the filtering." R had said to the patient's family that although the patient had been getting the right antibiotics since he was admitted (although in fact the infectious diseases doctors had increased the dose), the situation was still quite severe, and the patient would need a lot more support before full recovery was possible. They had now identified the disease, but as he said to us (two nurses, the SpR and myself) basically every organ would need supporting, including dialysis. (Urban, visit 15).

It seems to me that the knowledge base of biomedicine is hardly explicitly implicated in these decisions and discussions about prognosis. In fact, the prognosis once a patient is in the ICU appears to be irrelevant. The patient is in ICU and receives a high level of nursing and medical attention, at least compared to other hospital wards. Hence staff can be quite candid about the "patient's chances". The implication is that whatever is being done by the doctors and nurses is all that could be done. Paradoxically, the fate of the patient is not regarded as being in the hands of the doctors and nurses. So, in one ward round, the Consultant was able to say about one patient: "She surprised me, I didn't think she'd improve", and about another: "I've got a bad feeling about this chap, that he'll die in a horrible way in a few weeks time." Similarly, at a nurse hand-over, a Senior Nurse said that one patient had "resurrected herself for some bizarre reason". These real and anticipated changes of status for the patient had little or no bearing on the treatment the patients were receiving: hence they seemed to have little bearing on medical or nursing work with the patient. In general, prognosis was not high on ward round agenda nor important in discussions about patient management.

Prognosis did come on to the agenda of ward rounds and discussions between staff when patients did not seem to have changed their status for long periods. In the following instance the patient had been in the ICU for a month.

[Ward round] SHO: "Bed 3 [names patient]... B [Consultant] contacted the surgeons, trying to get the patient better. Jet ventilator." E (Senior Nurse): "Is there any chance of recovery?" M (Consultant): "Single organ failure. Terrible lungs. Can't say"... M

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<sup>3</sup> 'Filtering' here means haemofiltration, a form of dialysis, i.e. particularly involved treatment.



says he is trying to be positive. “Good thing: thirty days recovery, not too bad. [We’ve] seen worse... Bad thing: everything else... Withdrawing treatment seems harsh because he is awake. Current plan - do nothing.” (Metropolitan, visit 10)

The formulation “do nothing” is rather paradoxical. One trainee (SpR grade) doctor told me that an important lesson he had learnt in ICU was “there is nothing wrong with ‘doing nothing’ when treating a patient, if you’re not sure what to do”. However, the phrase disguises an awful lot of work that is being done: this is necessarily the case as otherwise the patient would not be in the ICU. For example, the patient is receiving treatments: at the very least, mechanical ventilation, but also usually drugs to stabilise the heart or other organs, and nurses are doing technological work in monitoring various physiological functions. The meaning of ‘doing nothing’ is that nothing new is being done.

To return to the particular patient in the data extract above, and my substantive point that prognosis may be more important when there appears to be no change in the patient’s ‘status’, two days later I recorded the following conversation between two Senior Nurses (J and E):

[Senior Nurse hand-over]: J: “[Names patient] - not very well, fistula<sup>4</sup>, M [Consultant] is going to ring [someone at another hospital]... Half-way DNR<sup>5</sup>... He has depression: what could we do?... [The surgeon] had nothing to offer... DNR: family - do they know?’ E: “YES! We told them, ‘he will die’ we actually used the D-word.” (Metropolitan, visit 12).

The patient here is portrayed as likely to die, and indeed his relatives have been counselled that this is the most likely outcome. We can infer, by Senior Nurse E saying in this instance “we actually used the D-word”, that sometimes they do not use the “D-word”. So there is a clue here that Davis’ “functional uncertainty” is of use to ICU staff in managing their relationships with patients’ relatives.

The data I have presented in this section have indicated that the experience of ICU Consultants seems to overcome any lack of theoretical knowledge amongst junior staff. In turn, where the consultants lack requisite knowledge they call on other Consultants – experts – within the hospital. While doctors and nurses frequently expressed a confident view about a patient’s prognosis, there is little evidence that this affected

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<sup>4</sup> Fistula: an abnormal opening between two hollow organs, produced by injury, infection or surgery.

<sup>5</sup> DNR: Do Not Resuscitate order (recently renamed ‘DNAR’ - Do Not Attempt Resuscitation). ‘Half-way DNR’ pejoratively indicates an apparent inconsistency: that resuscitation may or may not be attempted depending on precisely which organs have failed.



clinical management, at least until a decision to withhold or withdraw treatment was made. In regard to decisions about treatment, we have so far seen hints of an action oriented and pragmatic approach. There is a residual medical orientation to practical issues, such that lack of knowledge is not an explicit problem. The practical orientation can also be seen in that even ‘doing nothing’ entails a lot of work, and is further seen in decisions about treatment, which are explored further in the next section.

## **Uncertainties in patient treatment**

Moving on from uncertainty in the knowledge base of biomedicine and its manifestation in making prognoses, I now focus more specifically on uncertainty issues around patient treatment. I start with the instances where sources of ‘uncertainty’ in patient treatment tend to be managed by risk assessments and protocols. Risk assessments may take the form of a ‘nursing risk assessment’ (for example, assessing the risks of moving a patient).

### Protocols, risk assessments and uncertainty

Risk assessments are embedded in formalised protocols and procedures. For example, there is a risk assessment algorithm for moving or handling a patient: patients with more attachments have a higher risk. Tubes and ‘lines’ connected to patients must be changed to prevent infection, every two, four or seven days according to their type, and the tips of lines are routinely sent to laboratory services for testing for infectious agents. There are also guidelines about which drugs can and cannot be mixed in the same ‘line’. All these aspects of patient care are managed by the nurse at the patient’s bedside. They only come to the attention of the doctors if something out of the ordinary is reported (for example, an infection). Similarly, the general responsibility for ‘hygiene’, for example teaching and training relatives about the importance of washing hands and wearing plastic aprons, is another ‘risk’ which is managed by nurses. These risk assessments codify the knowledge and enable doctors to delegate the decision-making, within certain limits.

Although not always explicitly linked to ‘uncertainty’ in medical treatment, protocols



are another way in which knowledge is codified and decision-making is delegated. There are protocols for specific treatments and procedures, for example, a ‘sepsis protocol’ and a ‘weaning protocol’ (for weaning patients off mechanical ventilation). Many of these were so well established that I rarely heard reference to them in the context of routine clinical work, although they were mentioned by Senior Nurses in interviews. One Senior Nurse informed me that there were two types of protocols: those defined by other hospital departments and those specific to ICU. The former, of which there are “dozens and dozens”, are diagnosis-specific, for treating one of the conditions for which a patient may be admitted to ICU. A Senior Nurse indicated that they were expected to be used – he told me that he would contact the relevant hospital department to obtain a copy if he could not find a protocol on the intranet. On the other hand, there are fewer ICU specific protocols and guidelines (some examples of ICU specific protocols were for the insertion of a cannula<sup>6</sup> into a vein, feeding and infection control).

The terms ‘protocol’ and ‘risk assessment’ imply that knowledge is well established, and able to be codified (and often quantified). Protocols provide a convenient shorthand for doctors to issue instructions, but the authority remains with the medical Consultant. It was claimed that the instructions in protocols were over-ridden by doctors if they saw fit:

Consultant L told me that they are supposed to have a ventilator strategy or protocol for weaning patients; the nurses sometimes raise objections if he changes it, but sometimes he has to because of a particular patient situation... (Urban, visit 23).

Such a claim was supported by a Senior Nurse, who said over-riding a protocol would be a ‘senior medical’ decision, adding:

As a nurse you monitor the data... Senior medical staff would decide whether to go with it or leave it (Interview, Senior Nurse, Metropolitan).

Usually, therefore, protocols are a form of delegation, but the final decision, and the authority to override the protocol, rests with (senior) medical staff. Protocols seem to be a convenient way of drawing lines around what is certain and knowable – what other hospital departments or regular advisors (*e.g.* microbiologists) need to instruct often.

Other health care professionals who do work in the ICU, for example Speech and Language Therapists, could be praised as having a “good protocol”. But the

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<sup>6</sup>cannula: a tube for insertion into a duct or cavity.



Consultants tend to retain their personal control: one Consultant, for example, refused to allow Speech and Language Therapists near his patients as *he* had not seen their protocol.

Uncertainties regarding drugs (their effects, side effects and idiosyncrasies) are handled by another distinct form of codified knowledge. The British National Formulary is routinely referred to by medical staff, but uncertainty in drug regimes is additionally managed by the activity of hospital pharmacists. One nurse put it to me that “she [the Pharmacist] corrects the doctor’s mistakes.” The pharmacists tended to visit each patient (ten to fifteen minutes per patient) and check the drugs (dose levels and interactions with other drugs). If necessary, they then speak to the doctors, but the communication between doctors and pharmacist(s) tended to be short and perfunctory, being information-seeking, information-providing and clarifying rather than exploratory conversation. This was the case whether the pharmacists were present at the ward round or not:

As Consultant R is leaving for a coffee break V [Pharmacist] comes out from a side room and asks him to review the dose of a drug on bed 1. (Urban, visit 16).

[Ward round] N (Pharmacist): “the literature recommendation is to start early and give prophylactically.” (Metropolitan, visit 6).

[Ward round] Doctor: ‘...We tried frusemide to see if urine, didn’t work - back on filter...’ N (Pharmacist): ‘12.5mg bolus versus prescribe slowly; you have to discontinue and re-prescribe. Large dose is dangerous...’ (Metropolitan, visit 10).

[Ward round] N (Pharmacist): “... dose should be three times a day, not twice. Not in renal failure is he?” (Metropolitan, visit 10).

These interactions, representing the technical expertise of the Pharmacist, is of a different quality to intra-medical interactions. Pharmacy is regarded as forming a well-established knowledge base and the Pharmacist provides technical advice. B. Turner (1995: 143) commented that

Pharmaceutical knowledge is based on exact sciences and has been developed by widely accepted procedures of experimentation. Pharmacy leaves little scope for hermeneutics.

So uncertainties in medication issues are regarded as being part of a scientific knowledge base. There is little scope for discussion – the answers are well-defined, requiring little interpretation.

It is apparent that one way of managing risks and uncertainty is to treat them under the



headings of protocols, routine clinical audit and routine drug management. In this way, knowledge which is ‘biomedical’ becomes, for the time being, non-relevant as far as the doctors are concerned: although if there is any kind of difficulty it can be reincorporated into the medical domain.

### Managing treatment uncertainties

There do remain, however, uncertainties in patient treatment which do not fall into the category of risk assessments or drug management, and which require management by medical staff. Consultants commented that there are some treatments and procedures which are either inherently ‘risky’, or there are risks in particular situations. In these instances the ‘risks’ are held to be within the purview of medical skills and expertise:

[Morning hand-over:] Consultant W spends some time discussing a new admission (over the weekend). Had been discharged from A&E – history of orthopaedic problems; obese and with a ‘pain in the neck’... was readmitted... “I elected not to intubate as it would probably kill him”... ‘Maintained on bi-pap [mechanical ventilation], tried to put in a central line seven times...’ “Elected not to dialyse, that was the first difficulty... I told his wife he’d die twice, and he hasn’t. I’ve thought of [another] reason why I didn’t dialyse: he might go unconscious and die. My way of coping with all that risk was not to do anything” (Urban, visit 8)

So in this case the necessary treatment and procedures were not possible to administer. One procedure was attempted seven times, another the Consultant ‘elected not to do’ as it would probably cause death. The Consultant had wanted to perform these procedures as a result of his clinical assessments. But another Consultant later made some comments about the same patient, emphasising a pragmatic attitude:

Junior doctor’s hand-over: N (SpR) and P (SHO) are discussing the newly admitted patient. N: ‘Not suitable for theatre. Symptomatic treatment. Fair chance die, whatever.’ Consultant R comes in. N: “X-ray will hopefully rule out having to intubate. Is it still an option? Theoretically still an option”... P: ‘Consultant W had been against tracky, [he said] I can’t see his neck’. Consultant R: “We can only do what’s possible. Go through options, can’t do more - why worry about it?” (Urban, visit 8).

The consultant reiterates the pragmatic outlook that was seen earlier. In this case, though, it is a view about what can and can not be achieved: there is no point in spending too much effort if ‘clinically indicated’ treatments are not possible to administer.

As when ICU doctors were ‘uncertain in knowledge’ and obtained expert advice, risks



which were held to be within the purview of medicine could be managed by obtaining specialist medical advice. In the following example advice was obtained from infectious diseases doctors (regarding the probable diagnosis and consequential treatment), who in turn consulted neurologists (regarding the safety of a particular investigation):

One patient has suspected meningitis – to confirm this they need to perform a lumbar puncture to obtain the cerebral spinal fluid. This itself is a potentially risky procedure as if the brain is asymmetrical and too much fluid is extracted “the brain can get sucked out down one side”... Consultant R tells me that it boils down to what sort of doctor you are – do everything or risk the investigation. He is happy to pass the decision on to the infectious disease doctors...

[Later] Consultant R tells me that the infectious disease doctors didn't rush to do the lumbar puncture, wanted see the scan formally reported [by neurologists]. But as there is no asymmetry in the scan they'll go ahead: “Neurology are happy”. (Urban, visit 15).

Apart from obtaining specialist advice, the normal way of managing treatment uncertainty was in planning. Treatment plans featured highly in Consultants' normative descriptions of ICU. In an interview, having identified the first purpose of the ward round as a ‘communication exercise’, a Consultant emphasised the necessity of having a plan:

“The second [purpose of the ward round] is to plan what we're going to do with that patient, or what the plans are in terms of: are we moving forward; are we going backwards; what interventions do we need to do; are they going to need surgery. Are we getting to the point where they should be leaving for the ward?... I don't like coming in to see a patient in the morning and I don't know what the hell we're supposed to be doing with this patient. What have been the goals for the past 20 hours or whatever it is they've been [in ICU]. Because we should have some direction or some plan for the direction we're going. Now we may change it, that's fine, but at least [we should know] where we think we want to go then change it as is necessary that's fine. But kind of ‘well we're supporting her, well you know, I don't know’, well, all that kind of stuff just is silly. And it makes me cross.” (Interview, Consultant, County).

This data extract also indicates how Consultants perceive themselves to be intimately involved in routine treatment planning. A plan and a purpose seem to be essential. This ‘official’ representation of planning as part of the ward round was borne out by a later observation:

[Ward round:] L (Consultant): ‘What's the motivation with this patient? Is it to get her out of ICU to die or is it to get her out of ICU to be a long-term respiratory patient? [The chest physicians] would not be happy with that.’ The long-term objective is apparently unclear even though they had discussed this patient at the grand round... L expressed disappointment that there wasn't an objective, a rationale. (Urban, visit 5)

So ICU treatment ‘should be’ about moving patients along a path towards a ‘disposal’ (Bloor 1976), guided by a plan. The need for planning treatment seemed to be a cultural value which is instilled in junior ICU doctors. On one occasion I went to A&E with an



SHO from the ICU, to assess a patient who had recently been admitted. On seeing her, the ICU SHO said “she won’t survive intensive care”. When the A&E doctors on call (two SpRs, that is, more senior than the ICU doctor, although still a training grade) mentioned transferring to the High Dependency Unit, the ICU doctor said “well, only if you’ve got a plan”. On another occasion I heard another ICU SHO saying “there’s got to be a plan, tell me there’s a plan.”

One Consultant felt that intensive care might be perceived as just stabilising patients, and in this context he praised the junior doctors in his unit for making sure they were doing more than only responding to critical situations as they arise:

Consultant L gave the example of bed 1 – the juniors had done a tracheostomy today as the patient was quite stable, and would need a tracheostomy before fully recovered. She may never fully recover from her illness; but if she were to recover she would definitely need a tracheostomy before fully better. In his view it is better to do that now rather than wait for a more acute situation when you have to do an emergency tracheostomy, but he thought that some [ICU doctors] may say “look, she’s fine today, leave her, stability is everything” - kind of ‘leave well alone’. (Urban, visit 23).

Planning, by definition, involves determining an objective and considering what obstacles have to be overcome. Whereas I argued earlier that the diagnosis seemed to make little practical difference to prognosis, diagnosis was held to inform the planning of patient treatment.

### The purpose of diagnosis

Atkinson (1984: 952) expressed the following concerns about clinical education:

A substantial amount of time and effort is devoted to the *intellectual game of diagnosis* instead of the challenge of management, and this pattern of ‘detective work’ and puzzle-solving is established from the earliest days of clinical education (emphasis added).

Superficially, some comments from trainee doctors seem to encapsulate Atkinson’s viewpoint. For example one SpR, abstracting relevant ‘intensive care’ details from a patient’s medical notes, described the process as a “kind of puzzle... detective work” (County, visit 2). But I would argue that if, as Atkinson contended, clinical education encourages thinking of diagnosis as an “intellectual game”, trainee doctors in the ICU are encouraged to unlearn this ‘game’. One Consultant seemed to echo Atkinson’s concerns, and commented that diagnosis is the key to informing treatment plans and patient management, but is not of inherent value:



Consultant L: ‘Medicine [as opposed to surgery] is diagnosis driven - almost celebrate when you discover that a patient has really rare disease; or the discovery of a disease: for example, in the 19th century you used to name disease after the physician. This discovering a disease has a “*frisson* of enjoyment”, but it doesn’t help the patient. [I think] diagnosis is important in the ICU, especially in neurological patients, because it provides the framework for the treatment/care - the ‘plan’. For medical patients admitted to ICU you need to make a diagnosis (there generally won’t be one, or it won’t be adequately defined). For surgical patients, there is less of a need as essentially they come in with a diagnosis – their operation defines the diagnosis... You need to find the diagnosis. For example, one ‘puzzle’ is why can’t [one patient] move? We shouldn’t just be thinking “get her better” and then someone else might sort out her inability to move’. (Urban, visit 23)

The view that the management of surgical patients is more straightforward than medical patients was borne out by a later observation towards the end of a doctor’s hand-over.

The SpR, in almost an aside, said “Oh, yes, two admissions from theatre [he named the operation] - shouldn’t be any bother.” A further simple example of the diagnosis being important (but not interesting) was where a patient was placed on the ‘sepsis protocol’.

In summary, uncertainty in medical treatment of patients can be seen to be managed in four distinct ways. At one extreme, it is managed through delegation through codified protocols and risk assessments, a good example of which is dealing with drug-related uncertainties is delegated for the pharmacist to manage. In the case of pharmacy the protocols are not individually approved by medical staff (whereas it is for other health care groups), but the scientific knowledge base of pharmacology renders the pharmacist’s contribution bureaucratic, technical, routine and unproblematic. At the other extreme, the judgement may be made that treatment is ‘not possible’, and uncertainties and complexities are simply ignored. In between these two extremes, some treatment uncertainty is regarded as appropriate to be managed by medical staff. This is achieved either through planning by ICU medical practitioners, or by obtaining ‘expert’ advice from other medical practitioners.

### **Implications of uncertainty: clinical knowledge**

The different types of uncertainty, and the responses to them, I have analysed in this chapter enable me to present a typology of clinical knowledge in practice. For while I observed uncertainties in intensive care medical work in terms of two broad categories (the knowledge base of ICU medicine and patient treatment), the responses of ICU medical practitioners to each of these categories were markedly different.



A crude distinction in responses to uncertainty is that where a general uncertainty in the knowledge base was observed, this was not regarded as a problem by practitioners, whereas where uncertainties regarding patient treatment were observed they were actively managed. Knowledge about treatments are that subset of the general knowledge base of medicine which is related to action and application. By implication, any uncertainties in the knowledge base of medicine are not salient to the practice of ICU doctors unless the uncertainty is specifically related to a particular patient and their treatment. This crude distinction can be summed up: 'theoretical uncertainty is of no consequence; practical uncertainty can usually be managed'.

More specifically: some aspects of knowledge were regarded as not known (that is, not known to 'science', as it were), but this was of little consequence if appropriate treatments can still be implemented. Whereas confident assertions may be made regarding a patient's problems, these may be overturned by a doctor with greater experience, with equal confidence. Uncertainty in biomedical knowledge, whether a 'personal' lack of knowledge or a 'general' lack of knowledge, was not important in practice and was handled pragmatically. Likewise, the issue of prognosis was treated more as a matter of certainty than uncertainty: clinicians often claimed to be 'certain' about an individual patient's outcome. Where problems required non-ICU expertise the issue of solution to the uncertainty was distributed among Consultants of different specialties, and then was no longer a problem.

Where I observed uncertainties in treatment there were four sets of responses. First, where biomedical or technical knowledge for treatment was widely accepted, well known or well documented, the response to medical uncertainty was to formulate risk assessments or protocols so that the issues can be dealt with by nurses, pharmacists or other health care professionals. Second, while obtaining the diagnosis appeared not to be important in making a prognosis, it was important in the formulation of treatment plans, which is the normal, action-oriented, pragmatic approach to work in the ICU. Third, uncertainty can be managed by obtaining expert advice from other medical specialists, where discussions might be fairly detailed. On occasion the treatment plans could not be implemented because they were deemed too difficult.

These sets of responses imply that the knowledge (about which ICU practitioners are



sometimes uncertain) have very different statuses. There is a band of knowledge which is viewed as clinically appropriate, lying between well established, codified scientific knowledge, and matters which are too complex or otherwise not possible to deal with. In the next chapter I analyse this band of clinical knowledge further, taking forward the theme that knowledge is salient in so far as it is of practical consequence, and examine the warrants for clinical action in more detail.



## Chapter Six

### The ‘Craft’ of Medical Work in the ICU

In this chapter I analyse medical work in intensive care and argue that the term ‘craft’ encapsulates both the way that knowledge is applied and the work entails interaction with the material world. The salient aspects of ‘clinical knowledge’, so far as medical practitioners are concerned, were identified in the last chapter. There I concentrated on analysing the situated responses to uncertainty; in this chapter I invert the analysis to how ‘evidence’ is used in practice. The analytical question I address here is how can the relationship between knowledge and practice in medical work be best conceptualised?

My discussion in the first section of this chapter originates with Freidson’s (1988[1970]) extensive analysis of the profession of medicine – importantly subtitled “a study in the sociology of *applied knowledge*” (emphasis added). Updating and adapting Freidson’s discussion, I argue that it is the application of knowledge, inherent in medical work, which requires conceptualisation. I therefore review discussions relating to the interaction between knowledge, in the form of the ‘science’ of evidence-based medicine (EBM), and clinical practice. How these should interact has been articulated in terms of the traditional conception of medical work as an amalgam of ‘science’ and ‘art’. However, I find this conception problematic, and in the second section of the chapter I synthesise sociological conceptions of ‘craft’ in order to prepare for my argument that medical work in ICU can be conceptualised as a craft. The concept of craft which I develop not only captures the way that knowledge is used in medical practice but also has the additional important benefit of connoting the practical and material aspects of work. In brief, the synthesis enables me to specify two broad dimensions of ‘craft work’: the *application of knowledge* and the *interaction with the material world*. I elaborate these dimensions with respect to my data on medical work in the ICU in the third and fourth sections of this chapter.



## Evidence, judgement and science

Freidson's (1988[1970]) analyses of 'the clinical mentality' (*ibid.*: chapter 8) and the 'limits of professional knowledge' (*ibid.*: chapter 15) discussed the problem of applied knowledge, that is, the relationship between knowledge and practice. He made the important distinction between formal knowledge and applied knowledge, and maintained that "[m]edicine is of all the established professions based on fairly precise and detailed scientific knowledge" (*ibid.*: 162). However, medical work

... is the attempted solution of the concrete problems of individuals... by its nature it is applied rather than theoretical in character... Insofar as the practice of medicine at all uses science, then, it is characteristically oriented to *applying* rather than creating or contributing to it (*ibid.*: 163, emphasis in original).

Returning several times to the distinction between the production and the application of scientific knowledge, Freidson later outlined the "problem of applied knowledge":

"pure" medical knowledge is transmuted, even debased in the course of application. Indeed, in the course of application knowledge cannot remain pure but must instead become socially organised as practice... (*ibid.*: 346)

Freidson's discussion was rather polemical and of its time: he later (1988) referred to this time as the "golden age of medicine". His was an ideological critique of the "profession of medicine", with an

emphasis... on both sides of the meaning of the word – 'profession' as a special kind of occupation and 'profession' as an avowal or promise. (*ibid.*: xv).

Thus, phrases like "medical knowledge is transmuted, even debased" might come across as exaggerated. However, Freidson's discussion remains important for the principal reason that he was arguing about control of professional activity, autonomy and clinical judgement. These issues remain important in today's health services, although the terms of the debate have shifted under pressure from the EBM movement.

Debates about the relationship between medical knowledge and clinical practice are now firmly rooted in a discourse dominated by the EBM movement, and EBM has both vindicated and challenged Freidson's arguments against the profession of medicine. On the one hand, EBM has demonstrated that, at least in principle, many kinds of clinical decisions are potentially rationalisable, can be based on well founded, 'scientific' knowledge, and can be opened up to external scrutiny. On the other hand, debates about EBM have shown that, at the very least, implementing EBM is not a simple matter and doctors still resist attempts to control their work (Black and Thompson 1993). The core



issues seem still to be clinical autonomy and clinical judgement.

EBM, according to its advocates, is the “conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients” (Sackett *et al.* 1996: 71). Its most cherished methods are randomised, controlled trials (RCTs) and systematic reviews incorporating meta-analysis of the results of RCTs. It therefore claims to represent the best scientific knowledge. However, as Freidson pointed out, medical work is *applied*, not *scientific* in the sense of ‘producing knowledge’. The EBM movement in principle acknowledges this:

The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research. By individual clinical expertise we mean the proficiency and judgement that individual clinicians acquire through clinical experience and clinical practice. (Sackett *et al.* 1996: 71)

However, in debates and discussion in the medical literature, EBM is often represented as riding roughshod over ‘individual clinical expertise’. For the case of intensive care, the interaction with the EBM movement presents a further intriguing issue, for the ‘evidence base’ of intensive care is regarded by practitioners as particularly poor, and this viewpoint seems to be shared by ‘leaders’ of the EBM movement (see, for example, Chalmers, 1998). Two recent controversies of EBM applied to intensive care reveal some interesting aspects of the ways in which ICU doctors view their work. These controversies centred on articles reporting systematic reviews of RCTs of two treatments for fluid resuscitation in critical care patients: the administration of colloids and the administration of albumin. These related but separately published systematic reviews (Schierhout and Roberts 1998, I. Roberts *et al.* 1998) were associated with copious correspondence in the *British Medical Journal*<sup>1</sup>. The reviews indicated that the continued use of colloids (Schierhout and Roberts 1998), and in particular the case of human albumin (I. Roberts *et al.* 1998), were not beneficial, and may be associated with an excess of deaths. The reviews recommended that alternative, less expensive treatments than colloids be used, and that the use of human albumin be

urgently reviewed... it should not be used outside the context of rigorously conducted, randomised controlled trials. (I. Roberts *et al.* 1998: 235).

The responses to these systematic reviews were overwhelmingly hostile. A total of nineteen letters were published, and five categories of objections raised by ICU

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<sup>1</sup> Letters published in the *British Medical Journal*, 1998: 25 July; 1 August; 26 September.



practitioners can be identified. First, there were alleged problems with the searching and statistical methods of the review (certain studies were wrongly excluded; the reviews combined heterogeneous patients and heterogeneous treatments; the investigators should have used more conservative statistical methods). Second, the reviewers were accused of lacking clinical insight, including the claim that current clinical practice was not adequately reflected in the original trials. Third, the biomedical mechanisms of possible harm caused by colloids or albumin are unclear, and letter writers made an appeal to more basic pharmacological or pathophysiological mechanisms which would support their continued use. Fourth, there were claims that the treatments actually do work for a sub-group of patients. Fifth, the motives of the researchers and journal editors were questioned: it was suggested that publication was driven by political considerations or a cost-cutting agenda.

The ICU doctors who wrote to the *British Medical Journal* clearly did not like these studies' results, and a reasonable inference is that they wanted to justify current clinical practice in the light of some potentially very damaging 'evidence' to the contrary. In particular, the 'lack of clinical insight' argument indicates how ICU practitioners were concerned to preserve some degree of control (autonomy) over their clinical practice. A related anxiety was that there were, apparently, no viable alternative treatments:

the abandonment of the use of [colloids]... would encourage excessive administration of salt and water, leading to fluid overload, interstitial oedema, poor oxygenation, and organ failure. (Gosling 1998).

To produce the same [clinically desirable effect as a standard dose of] albumin... would require up to five times as much volume of crystalloid [which] may lead to problems with fluid overload, hyperchloraemia in renal dysfunction, and pulmonary oedema. (Petros *et al.* 1998).

Practising clinicians therefore faced a quandary, which I would summarise as being caused by an *orientation towards action* - a theme which recurs throughout this thesis. Clinicians, faced with patients in extreme physiological distress, perceived the need to do 'something' to alleviate that distress. That this 'something' might sometimes, or in some cases, be harmful was out of their immediate concerns. There are (according to Gosling and Petros *et al.*) no readily available clinically effective alternatives.

Such controversies about EBM are couched overwhelmingly in terms of 'basic science' or 'research methodology' (as illustrated by the other kinds of responses in the examples above), and EBM can be seen to have successfully moved the parameters of



debates about what counts as appropriate and justifiable clinical activity. But below the surface remain Freidson's central concerns: professional autonomy and judgement as to what counts as appropriate knowledge. As predicted by Armstrong (1977), the advent of "clinical science" (in the form of what he called "controlled clinical trials") has, to some extent, eroded the individual authority and autonomy of clinicians. As he put it, "the language of clinical science cannot recognise the arguments of clinical experience" (1977: 601): they are radically different discourses.

The controversies surrounding EBM might be thought of as a tension - or "balance" , (Armstrong 1977: 601) - between 'art' (in the form of individual clinician judgement) and science. One response to this tension is to re-emphasise the traditional conception of medicine, that it *is* an amalgam of science and art. This conception continues to have a great deal of salience; it was, for example, advocated in a recent book entitled *Clinical Judgement: Evidence in Practice* (Downie and Macnaughton 2000: ix):

There is an old adage that medicine is both a science and an art. We try to give a detailed explanation of what that means, and to show how the 'evidence-based medicine' movement can be integrated with the 'arts or humanities in medical education' movement. This integration provides the basis for the sound clinical judgements which are evidence in practice.

Downie and Macnaughton gave a medico-philosophical account of the nature of medical decision-making. Their (normative) characterisation of medical work was that medical judgement incorporates artistic components, and they made the following comments on the "art of medicine":

"...[M]edicine is an art in the following senses: it involves the weighing of evidence in individual cases, the interpretation of the patient's anecdotes, and other features of the consultation; the exercise of skills, including communication skills in a manner appropriate to the individual case, and leading to the obtaining of informed consent. The common thread in this, which justifies the use of the term 'art', is that *there can be no rules to direct the doctor*. Even 'guidelines', a fashionable idea of ruling bodies in medicine, require interpretation in individual cases."  
(*ibid.*: 71, emphasis added).

However, I find their argument troublesome for at least two reasons. First, the senses they identify as consonant with "art" neither define, nor are unique to, art. In particular, the claims that "weighing of evidence" and "communication skills" are 'artistic' is tenuous. Second, their comment that "there can be no rules to direct the doctor" seems to have ignored half a century of social scientific research which has identified normal cultural and social rules of intercourse. Medicine has been especially well studied in



this area, and the results of these research efforts are included in medical school curricula (e.g. Morgan's (1997) chapter *The doctor-patient relationship*).

This particular 'medico-philosophical' approach to re-appropriating the metaphor of 'art' for medical judgement, in response to the rise of EBM, would appear to be of limited empirical use. But the analytical problem of a tension (or balance) between individual clinician judgement and scientific knowledge remains. My argument in this chapter is that this relationship might be most appropriately characterised by the term 'craft'. In preliminary support of this contention I turn to a paper in the field of historiography and a concept in the sociology of work and occupations.

Watson (1998) demonstrated the analytical value of conceptualising one medical specialty as a craft. He argued that the historiography of psychiatry was characterised by two opposing factions: the "psychiatrists as amateur historians", with a 'Whig view of history', and the "historians as amateur psychiatrists" who tended to adopt a much more critical, social constructivist tone. The problem for both factions was that their main sources of evidence were psychiatric text-books which, Watson argued, may not adequately represent what psychiatrists did (or do). He suggested that one way of reconciling the opposing historiographies was to conceptualise psychiatry as a craft, comprising both scientific knowledge and practical skills, including the skills of interpretation. The empirical and analytical nature of history, in these senses similar to sociology, suggests such a conception might be useful in other medical contexts.

The sociology of work and occupations, insofar as it commented on medicine, tended to be concerned primarily with a "traits" approach to the study of professions. These arguments stalled when the criticism that professional claims were being analysed uncritically by sociologists was recognised. Professional *claims*, in turn, became a topic for sociological analysis. Central to this shift from analysing the *work* of 'professionals' to analysing their *claims* were a paper by Jamous and Peloille (1970), followed by a reformulation by P. Atkinson and colleagues (1977). I briefly reconsider these papers; I want to make the point that sociological analysis need not be limited to the claims of professionals (in this case, doctors): the content of medical work can also be analysed.

Jamous and Peloille's (1970) paper was a discussion of professional knowledge. They introduced the concept of the "indetermination/technicality (I/T) ratio" in an analysis of



the rise to dominance of a medical elite in France. They argued:

The I/T ratio expresses the possibility of transmitting, by means of apprenticeship, the mastery of intellectual or material instruments used to achieve a given result. This makes it possible to appreciate the limits of this transmissibility; i.e. the part played in the production process by 'means' that can be mastered and communicated in the form of rules (T), in proportion to the 'means' that escape rules and, at a given historical moment are attributed to the virtualities of producers (I). It can in theory characterise any given process of production. Made operational the I/T index would provide a dimension along which it would be possible to order any given set of activities. (*ibid.*: 112).

As P. Atkinson and colleagues later (1977) pointed out, there is a conflation of proposed analytic uses for the I/T ratio. On one hand, it seems to have an 'objective' quality, measuring the 'means' that can be expressed in terms of rules and the 'means' that escape rules. On the other hand, it represents a means of analysing professional ideologies. Jamous and Peloille presented their own analysis in terms of ideological critique: they examined the ideological relationships between hospital clinicians and society, casting their I/T ratio as a resource for the analysis of professional claims. This approach was followed by Atkinson and colleagues (1977), who discussed how these kinds of concepts were used in a series of professional discourses and arguments within the medical profession regarding payment for doctors' services in the British NHS. The concept has been used, therefore, to examine the process of professional claims-making.

The concept of the 'I/T ratio' was recently mentioned in a sociological analysis the *content* of medical work, in this instance surgery (Pope 2002). It seems to me that this is an important and potentially valid approach. Assuming that aspects of the content of work *can* be examined, there might be some mileage in re-introducing the concept. However, although there is a resonance between the 'I/T ratio' (or the concepts of technicality or indeterminacy considered separately) and 'craft', my data from ICU indicate that 'craft' is a more salient, appropriate and analytically useful concept for medical work, at least for this specific locale. The main reason why I did not want to analyse my data in terms of the 'I/T ratio' is that there seems to me to be little theoretical indication, and little indication in my data, that "intellectual or material instruments" are made up of these, and only these, components. The term 'craft', on the other hand, can capture the way that knowledge, as it is used, is local and embodied, as well as the way that the work has a significant material component. In order to justify this position, I now review the sociological conceptions of 'craft', before presenting relevant empirical data from medical work in ICU.



## Sociological conceptions of 'craft'

The term 'craft' is not a well-defined concept in the sociological literature. This is perhaps unsurprising given its varied common usage. According to dictionary definitions, primary definitions of craft are: skill, especially in practical arts; to make in a skilful way; a trade or art, especially one requiring manual skill (*Oxford English Reference Dictionary; Heinemann English Dictionary*). A review of the sociological literature reveals five broad conceptions of the term 'craft'. In approximate historical order, these are: craft as an occupational category; intellectual craftsmanship; craft compared with art; laboratory crafts; and surgical crafts. In synthesising these conceptions, I specify craft according to the two dimensions of the *application of knowledge* and the *interaction of with the material world*.

The first conception is from the sociology of work. Craft is considered as a category of occupation, assumed (as in the dictionary definitions above) to comprise skilled manual work. For example, Lee (1981) examined the de-skilling thesis and made comments on the ambiguity of the concept of skill:

On one hand it is assumed that some useful sociological purpose can be served by examining changes in 'real' skills, i.e. that it is meaningful and possible to talk about the typical levels of dexterity and/or knowledge required... On the other hand it is widely recognised that skill is also in varying ways a social construct. Divorced from their specific historical and industrial setting, for example, attributions of skill to individuals and groups may be highly misleading. (*ibid.*: 56).

Lee went on to argue that the skills of craft workers were not 'socially constructed' by trades unions, but rather there were 'real skills', salient to, and valued by, employers.

Reckman (1979) discussed the history of his own craft of carpentry. Five points can be elicited from his discussion of "the nature of the material, the process and the product" (*ibid.*: 76-77). First, there is a continual need for judgement about the purpose of the job at hand, and a need to weigh quality with compromise. Second, craft work is in general a complex, sequential process, with later stages dependent on earlier decisions. Third, complex logistical arrangements must be made; the stages of design and layout (at the beginning) are crucial. Fourth, manual skills and dexterity are required. Fifth, "problems" are unique in each job undertaken, yet these jobs have many of the same, basic, common features.



More recently, Barley and Orr (1997) mentioned ‘craft’ in contra-distinction to technical work. They suggesting that ‘technical work’ sits at the

intersection of craft and science, combining attributes of each that are normally thought to be incompatible. It is a cultural anomaly in which mental and manual skills coexist inseparably, if not always comfortably. (*ibid.*: 12).

Their definition of technical work was intended to describe professional work, including medicine:

[W]e submit that it is ... productive to identify technical work by a loose constellation of [four] attributes... (a) the centrality of complex technology to the work, (b) the importance of contextual knowledge and skill, (c) the importance of theories or abstract representations of phenomena, and (d) the existence of a community of practice that serves as a distributed repository for knowledge of relevance to practitioners. (*ibid.*: 12)

These traits seem to describe acute medicine well. However, I want to note, with reference to Lee (1981) and Reckman (1979), that Barley and Orr argued that manual skills and material aspects of work are largely absent from technical work, but present in craft working. Technical work is assumed to have a singular material component: ‘complex technology’.

From these examples in the sociology of work, therefore, we can see that craft has been identified as comprising “real” manual skills and *ad hoc* reasoning, judgement and planning. Some writers have articulated a qualitative difference between craft work and technician’s work (Barley and Orr 1997). Consideration of the second conception of craft I identified retains a distinction between “craft” and technical work. This conception transfers the metaphor of craft from manual to intellectual types of work.

The prime example of this second conception of craft is Mills’ (1959: 195-226) “personal statement” concerning the *intellectual craftsmanship* of sociology. This was mainly a didactic exhortation to the young social scientist scholar and we should note that, for Mills, the connotations of craft are overwhelmingly positive. He used the term rhetorically rather than analytically: “the intellectual workman forms his own self as he works toward the perfection of his craft” (*ibid.*: 196). Apart from this, though, we can discern several facets to Mills’ views on craft. First, it is about working on “problems of substance”:

To the individual social scientist who feels himself a part of the classic tradition, social science is the practice of a craft. A man at work on problems of substance, he is among those who are quickly made impatient and weary by elaborate discussions of method-and-theory-in-general; so much of it interrupts



his proper studies. (*ibid.*: 195).

Second, craft workers are required to be flexible in their approach:

Be a good craftsman: avoid any rigid set of procedures... Avoid the fetishism of method and technique. (*ibid.*: 224)

Third, craft working (“craftsmanship”) is in some sense “higher” than technical work:

It is [the sociological] imagination, of course, that sets off the social scientist from the mere technician. Adequate technicians can be trained in a few years. ... Perhaps [the technician] is too well trained, too precisely trained. Since one can be *trained* only in what is already known, training sometimes incapacitates one from learning new ways. (*ibid.*: 211-12).

To sum up Mills’ conception, while practical craft workers demonstrate manual dexterity, the intellectual craft worker also works on ‘substantive problems’. Unlike the technician, she is not bound by fixed rules – the work goes beyond formal training.

Perhaps, after all, what distinguishes craft from technical work is “artistry”? Not quite: Becker (1978) compared and contrasted “arts” and “crafts”. His argument was that what is regarded as a ‘craft’ may be transformed into an ‘art’ (the reverse process may also occur). Whether a practice is regarded as an art or craft depends on the relative “emphases on the standards of utility, virtuoso skill, and beauty” (Becker 1978: 862).

Becker summarised:

Craft implies practical utility, art does not... Craftsmen consider utility an important consideration... Both viewpoints can use beauty as a key consideration... Craft need not refer itself to beauty but sometimes does. When it does, it signals the emergence of an artist-craftsman segment. Virtuosity appears in both art and craft worlds as a standard of judgement. It implies an ability to handle a wide variety of techniques and materials with ease and efficiency and an ability to do what few others can do. (*ibid.*: 887-8)

Transferring Becker’s arguments to the case of medical work, therefore, if I am to characterise medical work as a craft, I need to show that it has the properties of utility and virtuoso skill. By extension, for Downie and Macnaughton’s (2000) argument (that medicine has artistic aspects) to be upheld, they would need to demonstrate that the criterion of “beauty” is inherent in medical work, and the criterion of “utility” largely absent. As I demonstrate in the empirical sections of this chapter, medicine is more similar to the work of traditional crafts, such as plumbing, than the work of a musician (as contended by Downie and Macnaughton 2000: 71-2). This relates in part to the role of metaphors, concepts and analogies in social science and the humanities. On this note it is important also to respond to a more general point made by Becker in his paper:



I have no preferred meaning for either term and no intention of legislating definitions for them: quite the opposite. As folk terms, “art” and “craft” refer to ambiguous conglomerations of organizational and stylistic traits and thus cannot be used as unequivocally as we would want to use them if they were scientific concepts. (Becker 1978: 863).

However, all social scientific concepts can fall into this trap. Language is all we have with which to attempt to represent the world. The meaning of words, be they concepts, metaphors, is always open to reinterpretation. But in keeping with the tone of this thesis, I think it ought to be acceptable to use “folk” terms as shorthand, and to specify those aspects of the “folk” meaning which are amenable to analytical and conceptual development. In any case, the term craft is used in the social scientific literature, especially in social studies of science and technology (SSST).

In SSST, by which I include the related areas of science and technology studies and sociology of scientific knowledge, the ‘craft skills’ of the laboratory have been contrasted with a normative conception of scientific practice. Latour and Woolgar’s (1986) detailed laboratory study, for example, examined the micro-processes whereby scientific facts are constructed. Pinch (1981) found that the different craft skills of various branches of physics prevented physicists from properly understanding each other, even though they were investigating the same substantive area. More recently, Delamont and Atkinson (2001) reported an ethnographic and interview-based study of science PhD students, and similarly emphasised the craft skills and craft knowledge inherent in scientific work. What is often common to SSST is a methodologically relativist stance to examine knowledge production at its source. Findings have identified and emphasised both how work is contingent and the necessity for ‘craft’ knowledge and skills. In contrast to Barley and Orr’s (1997: 12) assertion that attributes of science and craft are “normally thought to be incompatible”, scientific practice is found to include craft-like manual skills. This was most clearly brought out most in the *Golem* series (Collins and Pinch 1993, 1998), where the practice of science and technology were demonstrated to be the activities of expert, although fallible, human beings. The central argument of Collins and Pinch was that scientific and technological practice is not different in kind from most human activities, and they use the term ‘craft’ to emphasise this.

However, while these and other studies in SSST have found that craft skills are important to scientific work, little attempt has been made to specify ‘craft’ further.



Perhaps, like Becker (1978), they are resistant to using 'art' or 'craft' as "scientific concepts". So while papers in SSST have, to paraphrase Delamont and Atkinson (2001:101), explicated the taken-for-granted, tacit, craft knowledge of particular social groups, the term craft has been used in a broadly metaphorical way rather than developed as a concept.

Some of the theoretical and methodological approaches of SSST, following the recommendations of Bartley (1990), Casper and Berg (1995) and Elston (1997), are being increasingly adopted in medical sociology. 'Craft skills', though, have tended to remain under-explored, with the possible exception of surgical skills, which is the fifth sociological conception of craft I identified in the sociological literature. Two recent studies of surgical work (medical and veterinary) highlight the craft aspects of these activities.

Pope (2002) analysed routine surgical work, suggesting that

surgical work is... contingent upon the surgeon's sensory responses to visual stimuli and... depends on the surgeon being able to 'feel' ligaments and 'recognise' good tissue. (Pope 2002: 379)

She identified other ways in which surgical work was contingent ("conditional and subject to chance" – *ibid.*: 379), and commented that

The presence of... contingencies in surgical work means that it resembles other types of craft work... it has been argued that, in order to perform this kind of work, practitioners draw on two types of knowledge, one – 'technical knowledge' – which may be formulated or specified as rules, and the other 'practical knowledge' which is characteristically nebulous, unformulisable and individualised. (*ibid.*: 380).

Pope continued by reviewing the "I/T ratio" (Jamous and Peloille 1970), as previously discussed. But, for present purposes, I want to note that for Pope surgery resembles craft in terms of how contingencies are dealt with, as well as the more obvious way that surgical work resembles craft in dealing with the sense of touch and manual dexterity.

Pinch and colleagues (1997) focused on the transmission of surgical skill from experienced veterinary surgeons to trainees. They argued that while some elements of skill are specific to individual experience (for example, gaining confidence, not experiencing a situation as novel, becoming more dextrous in routine manipulation), other elements of skill may be difficult to master but can be learnt *in situ* through practice. So "tacit elements of skill can... be passed on by direct instruction from a



skilled practitioner.” (Pinch *et al.* 1997: 102). Such ‘passing on of skills’ resembles learning by apprenticeship, as brought out by Melia’s (1987: 184ff) characterisation of nursing as a ‘craft occupation’: that it encompasses learning a skilled occupation through apprenticeship.

My focus now is on specifying aspects of ‘craft’ pertinent to everyday clinical practice.

### Synthesising and specifying ‘craft’

Attempting to synthesise these diffuse descriptions and conceptions of craft, I identified the following four characteristics. First, craft work is *skilled*, and (apart from the case of “intellectual craftsmanship”) entails manual dexterity. Second, there is usually a *formal knowledge base*, although the details and theories of the knowledge need not necessarily be fully understood. Third, *local and practical reasoning* is paramount: the craftsperson not only formulates plans and implements them, but can change these plans with relative ease when difficulties arise. Fourth, the work is related to the *material world*, which is generally altered, repaired or improved in some way. In the following two sections I present data relating to these characteristics under two broad dimensions. The first dimension combines the (not necessarily fully understood) knowledge base and local, practical reasoning: I term this the *application of knowledge*. The second dimension combines the skilled, dextrous aspects of work and improvement in the material world, which I term the *interaction with the material world*.

To consider the point of this analysis, it might be asked, why should we bother to characterise medical work in this way? And might it not fall into the alleged shortcomings of the ‘trait characteristics’ analysis of professions? My answer is that it need not fall into these shortcomings and it can help our understanding of what it means to *do* medicine. On the contrary, presenting and analysing work from an empirical basis is to accord less mystique to the ‘indeterminate’. The principal charge against the ‘traits of professions’ analyses was that they too readily took the public declarations of the professions themselves at face value (P. Atkinson *et al.* 1977). In contrast, my approach to a micro-sociology of medical practice is based on empirical evidence of the work in practice and in context. There are undoubtedly dangers of a craft metaphor: as we have seen, the term ‘craft’ has generally quite positive connotations, and such an analysis



might perpetuate medical myths about “artful diagnosis”. Indeed, Anderson (1992), in an analysis of the attempted introduction of a computer based diagnosis system to a hospital, commented on the rhetoric of “craft knowledge” versus a “logical-empiricist procedure construed as scientific” (Anderson 1992: 653). However, Anderson’s analysis was of the discursive resources utilised, not an analysis of the content of work itself. My analysis may end up supporting or perpetuating a “medical myth”, but at least done so from an independent, empirical perspective.

Before turning to the data, we need to note some unusual features of intensive care. There are at least four ways in which work in the ICU is *unlike* other locations for medical practice. These dissimilarities increase the appropriateness of the craft metaphor for this specific locale.

First, patients are, more than in many other areas of clinical practice, physical bodies rather than social patients. Indeed, if patients *are* ‘social’, they are often not considered appropriate admissions (see chapter five, page 124). While in some other areas of acute medicine, for example, surgery, the patient is sedated or anaesthetised, this is generally for a predetermined period of time and for a specified purpose, whereas in ICU it is for an undetermined period of time. Furthermore, it is a consequence of the clinical definition of intensive care (Smith and Nielsen 1999): if patients need intensive care they are usually sedated and mechanically ventilated, and thereby become non-social beings.

Second, the materiality of the environment is evident – machines, bodies, tubes and drugs are all pertinent features of the work. As mentioned in chapter four, this is clearly observable on entering an ICU. Equipment in the ICU can assist with, and monitor, almost every kind of body functioning.

Third, patients come into ICU with a range of ‘diagnoses’. The ICU is a general service which treats severe physiological abnormalities rather than a specified disease or surgical problem (although a particular ‘disease’ or surgical problem may precipitate the need for intensive care). Its knowledge base is therefore potentially wide – more than one informant described ICU work as the “GP of the hospital”, less concerned with the details of a medical problem than finding an intervention which works. It is unlike a surgical speciality (defined by expertise in a particular anatomical area) or medical



specialty (defined by expertise in diseases of a particular body system).

Fourth, as discussed earlier in this chapter, the ‘evidence base’ is regarded by practitioners (and some of the EBM elite) as particularly poor. We do not need to assume that this is necessarily ‘true’<sup>2</sup> and it may well be that other kinds of medical work will make the same claims about their own specialties, especially if prompted. However, this facet of ICU was mentioned to me several times, unprompted, as an important and salient feature of work in ICU, by both experienced and less experienced doctors. It forms a part of the common discourse about intensive care work.

In the following two sections I analyse medical work in the ICU according to the two broad dimensions of ‘craft’ specified above: the *application of knowledge* and second, the *interaction with the material world*. As I shall show (and in this ICU is not different from other areas of medicine), knowledge is related to action (following Freidson), not to its source or authority, and is embodied in practitioners and their skills. An important point is that the skills that are used are overwhelmingly ‘embodied and tacit’, learnt through apprenticeship, and ‘formal knowledge’ is not a readily perceivable background. One consequence is that I did not feel the need to ‘deconstruct’ some alleged difference between ‘scientific knowledge’ and ‘local, tacit knowledge’. In practice, although ‘knowledge’ might exist outside of the immediate context, it is inevitable that for it to be *used* it must become localised (Timmermans and Berg 1997, Latour 1987, 1999b).

### **Application of knowledge**

In this section I analyse knowledge in the ICU, in particular how ‘evidence’ is used in practice. The term ‘evidence’ was generally used in practice not to refer to ‘scientific evidence’ (biomedical knowledge) but to particular readings, charts and laboratory results for the particular patient. On more formal occasions, for example hospital-wide medical meetings, there was a nod towards ‘evidence-based medicine’ (EBM), and I consider the ‘fate’ of EBM in clinical practice shortly. I discuss several examples of ‘formal knowledge’ in my data first, before moving on to discuss other kinds of data

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<sup>2</sup> *cf.* the Thomas theorem: “When people define situations as real, they become real in their consequences.”



and information, which may or may not be captured in writing, on machines or spoken.

Medical knowledge in the ICU is practice-oriented and is overwhelmingly embodied and internalised. This is the normative and taken-for-granted reality of work in this medical environment. Some of my data, which at first instance might appear to be counter-examples, support this point:

T (SpR) arrived at the ward round. He said how he'd been called at 3am for a patient in HDU who had a 'GCS' of 3<sup>3</sup>. The Resident Medical Officer had called him, saying the patient was catatonic<sup>4</sup>. They had called out a psychiatrist (House Officer) who came on to the ward reading from a book (T mimics the action of walking with 'head in book'), and said (according to T): "2.5% mortality... er... that's it". R (Consultant) said "He wouldn't know - probably a GP rotation"... T encouraged the two ICU SHOs to go and see the catatonic patient: "go to HDU, it's textbook, really". P (SHO) said he remembered reading about it, thought it would be interesting... (Urban, visit 22)

Information 'from a book' is derided, therefore, and is characterised as providing only the barest of prognostic data which are of no practical use in indicating clinical action. In addition, it is provided by a House Officer, who is portrayed as interested in psychiatry only as a 'route' to General Practice. That the House Officer resorts to 'reading from a book' shows that he is not a competent member of the medical team. It is quite clear from T's comments that the House Officer was not invited to engage in discussion about subsequent treatment<sup>5</sup>. However, this 'catatonic' is a "textbook" case. Thus the textbook knowledge ("I remember reading about that, thought it would be interesting") is kept on hold from Medical School until it is seen in medical practice and can become embodied and useful knowledge. But the textbook recollections are very much background: no-one proposed going back to the textbook to look at what they 'should expect' to see, or to otherwise relate what is seen to the textbook description.

A similar attitude to 'textbook knowledge' can be seen when one of the SpRs came into the office and referred to a haematology textbook to refresh her memory about coagulation. In doing so, she said "I've learnt coagulation about 50 times", implying a degree of embarrassment: she felt she should not need to look in a book whenever she

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<sup>3</sup> GCS: Glasgow Coma Score. A widely used scale (3-15) of consciousness based on three simple observations (eye opening response, motor response, verbal response). A 'GCS of 3' means that the patient was completely unresponsive.

<sup>4</sup> Catatonic: patient rigid. The implication is that this is a symptom of mental disease, so the 'GCS of 3' was not caused by a *neurological* problem.

<sup>5</sup> In addition there is the problem of his category as a psychiatric House Officer. There are examples in my data of ICU Consultants regarding psychiatrists as 'absolutely useless' and House Officers as 'next to useless'. I suppose the difference is that a House Officer has the potential to become a proper doctor, whereas for the qualified psychiatrist it is already too late.



needed to know about coagulation. I do not think that she was embarrassed because coagulation is an easy subject to grasp – on another occasion an SHO gave the answer to a (didactic) question on coagulation as “I’d ask a haematologist”. The embarrassment felt by the SpR was that she had to ‘look it up’. Which is to say, important knowledge should be internalised or embodied, although as the SHO indicated, it is acceptable for important knowledge to be embodied in other practitioners, and therefore distributed throughout the wider “community of practice” (Barley and Orr 1997: 12).

Part of the reaction against such formal, ‘written knowledge’ may be that textbook information, or information on the ‘web’, for example, are often of little practical use:

[Ward round, with B (Consultant), Y and M (SHOs)]. M: ‘Bed 1 (new admission) - 22 year old, had a heart attack playing football, Ventricular Failure...’ B is reading the new patient’s notes. Y (SHO): ‘We searched the net yesterday, found very little. History of drugs and alcohol, might be something to do with that’... B (Consultant): ‘Cardiology - echogram’. Y: ‘Downtime of 8 minutes, came to A&E.’ B: ‘[Was he] tubed outside or here?’ M (SHO): ‘A&E’... B puts the notes down on the table beside him and is now listening more attentively... M: ‘On propofol.’ B: ‘Wake him up tomorrow possibly.’ (Urban, visit 26)

It is of no surprise to the Consultant that the SHOs found out very little from the ‘web’. He quickly moves on to more prosaic matters: refer to cardiology; get an echogram; where was he “tubed”; plans for weaning him off sedation.

Another way in which my assertion that formal knowledge is of little relevance to work in the ICU might be undermined is that the British National Formulary (detailing drug doses) is frequently referenced. I also witnessed a doctor referring to a specialised data book on dialysis. But I would classify these as *specialised data sources*. The lack of referring to detailed ‘texts’ may be because of the acute nature of ICU – there is little time to arrange for tests or search the literature. Or it might be that the problems of patients in ICU, notwithstanding practitioner claims about the “heterogeneity of ICU patients”, are generally quite well known.

The ‘problem’ of ICU treatments ‘lacking [scientific] evidence’ could be destabilised, as reports of clinical research (in journals or from conferences) are intermittently referred to in conversation. The statement can even be treated ironically: on several occasions, people quoted the ‘findings of research’ to me. But these ‘findings’ were always of research in which the practitioners themselves, or close associates, had been involved. Clinical audits were mentioned in the same way. From the few examples of



reference to external, ‘scientific’ evidence, I would construct a “hierarchy of evidence-in-practice” as in Table 6.1. Although this table adopts the format of the Cochrane Collaboration’s hierarchy of evidence (*Levels of Evidence* 2002), it is not intended to cynically undermine either the Cochrane Collaboration or ICU practitioners. Rather, given that whenever I heard reference to EBM, the ‘evidence’ cited seemed to quickly disappear in discussion, I want to point out that ‘practice-based evidence’ (N. Fox 2003) might be a more appropriate approach. Even where ‘our study’ was quoted, the study results themselves were rarely, if ever, translated to treatment regimes.

<b>Table 6.1 The hierarchy of evidence-in-practice in the ICU</b>	
Level of evidence	Description
I (a)	The study we conducted, in which I was directly involved
I (b)	The study we conducted, but in which I was not directly involved
II	The audit I/we conducted
III	My experience
IV	Your experience
V	The experience of someone else (usually someone “sensible”)

“Someone sensible” was explained to me as ‘another doctor who will understand our problem and give us the answer we want’ (SpR in ICU). In effect, all these levels could (if we adopt an extreme EBM perspective) be reduced to ‘our experience’, although that would not be entirely fair. Rather, I intend to point out that in the busy reality of service work, it is easier to apply knowledge which has been generated locally. In fact, if none of these levels provided a definitive answer, practitioners (usually junior doctors) sometimes referred to a database (*e.g.* TOXBASE for poisonings), specialist website, textbook or journal (preferably held on the ICU). For junior doctors, finding answers is no doubt considered to be part of their training, education and self-development.

By contrast to formal, background knowledge, important data for practitioners meant the ‘evidence’ about particular cases and ‘inscriptions’ - readings from machines or laboratory reports for individual patients. For example:

After a patient had had a heart attack they examined the ECG [Electrocardiogram]. Consultant R, in discussion with T (SpR), said: “The evidence shows... the ECG - same territory” [similar to one taken when the patient was originally admitted to hospital]. “Settled down. Question really is whether we go for a tracheostomy... but he’s better now... Off everything...” (Urban, visit 15)



Thus the ‘evidence’ is the particular inscription (the ECG). There is a necessity for immediate interpretation, reflecting an action-orientation as the ‘evidence’ has a practical use.

Laboratory results and on-site blood tests were also referred to, particularly at ward rounds, but these also, as in the example above, required immediate interpretation. For example, at a ward round a junior doctor had “the numbers” – the values of all the blood gas analyses, concentrations of serum, salts etc. in the blood (these are all in different units of measurements and ‘normal ranges’ are different for each test). As she started to read them out, the Consultant interrupted and asked her to “just tell me the abnormal ones” - so she was expected to immediately interpret the figures in front of her. Of further note is that the *meaning* of the numbers becomes disconnected from a ‘real’ scientific value. As one informant (SpR in ICU) told me, in a clinical context it is only the ‘normal range’ which is considered: is the number in the normal range or not? Thereby an apparently ‘scientific’ laboratory value, complete with units of measurement, has become a simple, categorical, binary (yes-no) value, with no unit of measurement.

Immediate interpretation occurred in other ways, and could be a means of completely by-passing the ‘numbers’ themselves. A couple of times in ward rounds I heard the phrase “clinically, I think...” An SHO explained to me when I asked him what ‘clinically’ meant:

It’s a way of ignoring the numbers. It means clinical examination, including talking to the patients. For example, a patient ‘looks clinically dry’ – you can tell this by examining the skin, using stethoscope. Clinical skills are not reading the numbers. For example, [in one case] - the central venous pressure was high, which meant that they were ‘full’ [of fluid], but by clinical examination I thought they were empty [of fluid]. (Interview, SHO, Metropolitan)

Thus ‘clinical’, interpretative information was privileged over the ‘hard’, objective, quantified data from whatever machine was reading the central venous pressure. Likewise, although there is plenty of written and recorded information in the ICU, it is not necessarily privileged over verbally communicated information. Non-written information can be very important to the accomplishment of work, but it is not called ‘evidence’. For example, when Consultants handed over by telephone, they might exchange non-documented information: “the kind of direction [the patient is] going in, relatives’ views: the kinds of thing you can’t get from the notes.” (Consultant L, Urban).



The following extract illustrates the potential for non-written, biographical, ‘non-bio-medical’ information to become clinically significant:

P (SHO) told me about a bit of a worry with the patient in bed 2. The tip of the epidural (routinely tested for bugs when removed from patients, every 3 or 7 days) had grown a bug which was resistant to the antibiotics they had been giving the patient. This was coupled to the fact that as she was waking up she had been saying she didn’t like the light (she had a mask over her eyes), an indication for meningitis. But the Consultant had not been too bothered as the daughter had said that she normally doesn’t like the light – she has curtains drawn at home etc... So P is not worried but is going to take bloods and send them off to the lab, to see if the “bugs are sloshing around the system.” (Urban, visit 22)

Of course, the information from relatives is not considered as absolutely reliable as the ‘objective evidence’ which will be obtained from the laboratory, and B will still send for further tests. But the comment from the relatives serves to lessen the urgency of further investigations and treatment for the time being; the doctors assumed that there is no meningitis. Any data can become clinical data, and all clinical data requires interpretation and contextualisation.

Medical notes combine the types of information mentioned above: they contain (assumed) diagnoses, and have incorporated into them all machine inscriptions, laboratory results, and medical “clerking” (past medical history). Notes (made elsewhere – either other departments or hospitals) were sometimes criticised:

“Documentation is half of it – when you see half of the admissions we have the documentation is appalling”; or, slightly less pejoratively: “The medical clerking didn’t go into past medical history. Don’t know who or what he’d seen before.” Either poor notes, or no notes at all (for example, an ‘unknown male’ admitted in an emergency) makes clinical work more difficult. This situation, where a patient has literally no known past medical history, was described to me as “the blind leading the blind”.

Two of the junior doctors told me about how they work with medical notes. In both cases this was different from their experience on other wards. The ICUs in which they were working were impressionistically run in very different ways, but there was a common emphasis from both Clinical Directors on medical notes and filing: going through the notes was regarded as a vital early stage of patient treatment in the ICU. In one unit, the ICU file was completely separate, and the junior doctor had to copy out ‘relevant information’ from the earlier medical notes. In the other unit, the Clinical Director expected the medical notes to be ‘tidied up’:



P (SHO) set up a new section in the medical notes for the new patient. He also put all previous notes in reverse chronological order... The patient had been in hospital for a while, and had 'medical' and 'surgical' filed separately even though they referred to the same problem. P put them together, and said sometimes he will abstract ICU information onto a new sheet. Especially useful ("for someone like me") is which [non-ICU] Consultant they had been under and the ICU admitting Consultant. When he joined the ICU he thought all the filing was "a bit of a faff", but now thought it was good - you can notice something that may have been missed, for example when a patient goes to theatre and they might have forgotten to give a particular drug. (Urban, visit 12)

Presumably in other hospital wards such a practice might also be 'useful', but staff there do not usually have the time to exert such control. This control, and attention to detail, was emblematic of the ICUs I visited. In general, the medical notes were referred to and written in by Consultants and junior doctors on their ward rounds and as they performed various tasks on the ICU. Visiting doctors from other specialties would also refer to the notes.

The foregoing discussion reveals the importance of context and interpretation regarding data in clinical work. Although I overheard one Consultant say in a ward round "just give me the facts", it seemed to me that there are no "just facts" as such. One of the implications of communicating verbally is that the context is more readily apparent, and a certain degree of necessary interpretative flexibility is maintained. For example, a patient was referred to ICU from A&E. There were three key pieces of information: "she has a known heart problem [this was in the medical notes]; she's just come in complaining of chest pains... but she can usually get to bingo". I heard this formulation several times as the SHO spoke on the telephone to the staff in A&E, then to the ICU Consultant, then again when he went to see the patient in A&E. "She can usually get to bingo" is an extreme example of the way that *any* piece of information can be used and passed around as a clinically relevant fact.

On the other hand, once a piece of information has been formally recorded, it might have to be interpreted differently:

F (SpR): 'It says in the notes "Uses oxygen cylinder at home", [but] that makes it sound worse than it actually is. He's actually not too bad, only needs to use the home oxygen occasionally' ... (Metropolitan, visit 9).

Which is to say, the written record requires contextualising and interpreting. The examples of medical uncertainty in chapter five, where the experienced practitioner seemed to have acquired greater ability to ascertain whether patients needed intensive



care or could be ‘monitored’ on the ward, also indicates how the Consultants have apparently acquired greater skills in interpreting the evidence before them, and the importance of contextualising data.

To sum up my findings on data and evidence in the ICU: knowledge needs to be applied, and evidence requires interpretation, very often immediately. There is an action-orientation to the evidence: it must be relevant to the problem at hand.

Knowledge and clinical judgement in this medical environment are therefore neither intrinsically “artistic” (creative and concerned with beauty) nor “scientific” (concerned with the production of knowledge). Rather, whether knowledge comes from some external source or a practitioner’s own ‘internalised’ experience, and whether data are laboratory readings or the patient’s ‘social history’, the application of knowledge can be appropriately conceptualised as craft-like.

### **Interaction with the material world**

Having considered the application of knowledge, in this section I consider the second dimension of craft: the interaction with the material world. I analyse how materials, in particular machines and bodies, are related to the work of ICUs. With regard to machines in the ICU, an analysis of which this section starts, I found empirical support for a literal reading of Latour’s “first principle”: “The fate of... machines is in later users’ hands” (Latour 1987: 295). However, I found differences in the ways in which different kinds of machines are “in the hands” of “later users”. In the later parts of this section I consider two aspects of materiality in terms of bodies in ICU: the way that practitioners deal with patients’ bodies and the embodied skills of practitioners themselves. The analysis I present here comes close to, but does not adopt, an Actor-Network Theory (ANT) approach, and I return to this matter in chapter nine.

To an outsider, a striking feature of ICU is the doctors’ and nurses’ fascination with equipment, machinery and technology. A Senior Nurse, for example, had been listening to her colleague on the telephone discussing a dialysis machine, then went over with him to the machine, saying “it’s a different kind of mechanism – I’d better see.” On another occasion three nurses discussed the pros and cons of a new suction machine, and one told me that “the old ones were a worry if you had a fiddly patient”. A



fascination with machines was even more noticeable amongst the medical staff. The anaesthetists in ICU particularly had stories about how they used to be able to construct some piece of equipment in the hospital workshop, or how they built certain contraptions, or about they were able to effect manual ventilation when a machine broke down.

I found that doctors in the ICU are renowned for their ability to understand technology of all kinds. For example, I witnessed them giving computer advice to non-ICU doctors, and I was told by some nurses that one of the Consultants was “the expert” at dealing with a tricky piece of equipment (placing rubber balloons onto a tube). They were also renowned for their hands-on attitude with all kinds of manual work: when a cupboard was being assembled in the ICU (appositely enough, to house an expensive new bronchoscope), the Clinical Director rang from the Operating Theatre to see how the job was going. One Senior Nurse said to me: “toys for the boys, like boy scouts in here: give [the Clinical Director] a screwdriver and he’ll do it himself”. The highly technical environment of ICU resonates with these kinds of hands-on problem-solving attitudes and aptitudes, which encompassed a spectrum of ‘high’ and ‘low’ technology. In one more example, the doctors had just checked a tube for leaks:

In the Seminar Room, Consultant Z and junior doctors; Consultant R comes in with the bronchoscope tube and all the doctors gather round and peer at it intently. Earlier Z and T (SpR) had put it under some water to establish that it was leaking. In the meantime they will have to revert to using the old one. It struck me how interested they all were in this simple rubber tube. (Urban, visit 12).

It is tempting to regard this as an interest in technology, machinery and equipment for its own sake – “playing” with machines. But the equipment of ICU is part and parcel of ICU work – that is, medical treatment of bodies. Equipment, as we have seen, covers a range of artefacts, from complex medical devices to simple rubber tubes. One typology that might classify equipment in ICU is its primary purpose. The purposes of equipment can be broadly categorised as *recording* patient readings, *monitoring* physiology, aiding *diagnosis*, and *treatment*. These categories of equipment form an ordinal scale of importance, demonstrated by the kinds of responses when the machines do not work. Where a machine malfunction affects diagnosis or treatment it requires a much more considered, careful and thorough response than when the malfunction affects recording or monitoring, as I now demonstrate.

The example I present below is where there was a ‘malfunction’ in a new information



technology system affecting *treatment* (although to be exact, as will be seen, the problem was as much a ‘design fault’ as a ‘malfunction’). The example illustrates the complex relationships and situated in-practice meshing between pharmacology, therapy, technology, wider organisational structure and inter-professional relationships. It concerns the giving of a drug, Gentamicin, for serious infections, and how all these aspects must be creatively managed to overcome a difficulty. The following record, abstracted from my field notes and conversations, shows particularly the amount of work that was required to overcome difficulties in patient treatment caused by a lack of coherence between a treatment protocol and how that protocol was managed using the new clinical information system:

Day 1 (11.30am, ward round). Junior doctor: ‘Query a drug error...’ – B (Consultant) says it is an ‘Adverse Incident’. Need to check the level for Gentamicin. Discussion about whether the level should be checked or not, should a doctor have done it, should the nurse have checked. But would a ‘D grade’ nurse necessarily know straight away?... The laboratory needs to send back the ‘level’ (special test), but they’re only open ‘office hours’.

Day 2 B (Consultant)... Goes round with the microbiologist: they discuss Gentamicin... Apparently the general wards would be better at managing Gentamicin - the ICU have had several ‘Adverse Incidents’. What should happen is that a blood test determines subsequent doses, and the nurse should check the dose. Junior doctors get a phone call to determine the new dose but then don’t inform the nurse.

Day 3 (Ward round) Drug levels – once you’ve got the daily Gentamicin ‘low’ trough levels. N (Pharmacist) leads a discussion about it, gives the normal regime. The dose becomes level at six hours. Yesterday it was taken 16 hours post-dose, which is a ‘random level’. Need the level to get ideal dosing... J (Charge Nurse), the junior doctors and Pharmacist discuss the best time to give the drug, bearing in mind you need to assess the levels six hours later and get the results back from the laboratory before the next dose is due (24 hours after the first); and how does that fit in with the ward rounds and hand-overs... H says the ideal prescription time for Gentamicin is midnight - take bloods at 6am, get results back the same day...

[Later] I chatted to Consultant B as he was going to a meeting. Gentamicin has toxicity - affects kidney and hearing, so has a ‘narrow therapeutic band/range’. There’s been a change of regime. Used to have a loading dose of 120mg (“normal adult dose”), then 80mg was given three times per day. Now the regime is for one big dose (~8mg per kilogramme of body weight), then get back some readings (six hours later) and calculate the daily dose to give - but need to get results back.

Day 5 ... Gentamicin – Computer Support Technician and Pharmacist will be trying to sort it out... Laboratory is only open ‘office hours’ and closes at 12noon on weekends. Problem if you prescribe the drug at 9am; takes an hour, then 4pm (for taking bloods) would be too late to get the results back from the laboratory. Before they introduced the clinical information system, they used flag up on the drug chart, by hand, what needed to be done.

One week later (8.15am, hand-over) Once the junior doctors are all in, the Sister leads the hand-over again... “[Bed] 16 - chase the ‘gent’ [Gentamicin] levels this morning”. (Metropolitan, visits 4, 5, 6, 7, 13)



The most basic issue was that the introduction of a new clinical information system had not adequately represented previous clinical practice, whereby the doctors had “flagged up” on the prescription chart what needed to be done, that is, they had written additional information. But this particular problem was enmeshed in other factors. The “treatment regime” of Gentamicin had fairly recently been altered (precisely why this change had occurred was not made clear to me – one Consultant described it as the “vogue” which seems to connote a suspicion about the reasoning behind the changes). Gentamicin is a ‘dangerous’ drug to give, having a “therapeutic” and a “toxic” range, so the necessity of determining the proper prescription level is vital. One month after the incidents recorded above, one of the Senior Nurses told me that the situation had still not been fully sorted out, because “if you are a novice critical care nurse and you see a prescribed drug you will just give it”. Under the previous paper-based system, the “novice critical care nurse” would not have “just given” the prescribed drug, since there would have been specific hand-written instructions on the drug chart to check the correct levels first. The Senior Nurses, doctors and the Pharmacist were now therefore having to educate nurses and doctors to be alert to this particular situation. To overcome a technical difficulty and an organisational constraint (the laboratory only working ‘office’ hours), therefore, considerable effort was required by many staff.

The above example demonstrates a problem where information technology was used for patient *treatment* (drug prescription). Overcoming difficulties with technology was part and parcel of ICU work. But an apparently more catastrophic failure (the clinical information system ‘going down’) was treated much more pragmatically by staff, since the main use of the technology in this context was for *recording* physiological values:

At the Senior Nurse hand-over, J says the computer system went down, so the nurses needed to take manual observations. Back on the ward, I noticed the computer technician rushing through somewhere. But from my perspective it didn’t seem to affect any other activity on the ICU. (Metropolitan, visit 12)

One of these Senior Nurses later told me about the handling of ‘manual observations’.

SC: On one occasion when the computer went down... Apparently the nurses had to write down the observations, and what happened then? Where did they write them down to start with?

E (Sister): We just reverted back onto the old paper system, so we have emergency paper and pens - so we just used the flow charts that were there before we went onto the computer system.

SC: Were these emergency paper and pens at the computers, at each bed?

E: No they are kept in a drawer in the nursing station filing cabinet and then when it was obvious that the problem wasn’t going to be resolved soon we defaulted onto paper...

(Interview, Sister, Metropolitan)



I was informed that some of the monitoring devices stored their information, but for others the paper and pen record was retrospectively entered onto the clinical information system later. The point is that to my view (and this view was shared by the Senior Nurse), it hardly changed the working practice. The clinical information system – in this instance – was very much a tool for recording what clinical activity had been done and what the patient’s readings were. Perhaps if the computer had been down for longer than half an hour there may have been additional difficulties, but the routine clinical functioning of the unit was not affected by this short interlude.

The computer (clinical monitoring system) can be seen in these two examples to have “acted” in both *treatment* and *recording*, but it was its usage in treatment which needed to be more creatively managed by human actors. When the machine malfunctioned in patient treatment much more work was required by the ICU staff than when it could no longer be used for recording patient values. The purposes of technology so far discussed can be regarded as *treatment* and *recording*, and I classify these as the highest and lowest levels of technology’s incorporation in routine clinical practice. Two intermediate levels are machines that exist for the purposes of *diagnosis* and *monitoring*. I have very little *in situ* data on machines for diagnosis breaking down or malfunctioning (indeed the Gentamicin example is the only example of a machine for treatment malfunctioning). I suspect that this is because if such a malfunction does occur, the machine is immediately sent away to be repaired (I did see machines with notes to that effect attached to them, ready for collection). However, I recorded several examples of monitoring equipment being regarded as incorrect in some way.

Monitoring equipment usually has alarms, which may go off intermittently, as a first level of warning. The attendant nurses tended to respond to these alarms straight away – generally by switching them off. If a nurse was too busy to switch it off she might call across “that’s only me”, but if she did not do so and the alarm went on for too long, other nurses would shout across, for example “switch that bloody alarm off, will you, you know what a servo-alarm sounds like!” In the first instance, the monitoring system is expected to be dealt with effectively by the nurse at the patient’s bedside. The warnings on their own distract and annoy other staff.

There were several responses to apparently erroneous readings. Similar to the way in nurses switch off an alarm, readings may be either ignored or routinely corrected, as in



the following examples:

B (nurse) asks M (SHO) – “Are you getting spurious sodium results?” M (at blood gas machine): “yeah”. (Urban, visit 14)

P (SHO) is at the recently admitted patient’s bedside (bed 3). Heart rate monitor shows 0, he adjusts the scale on the monitor and says “Heart rate of zero, methinks not”. (Urban, visit 24)

(Ward round) We go into the side room , and as the doctors were about to look at the computer screen, the nurse says “The trace is wrong – we have to correct it manually”. (Metropolitan, visit 10)

The contexts of these readings precluded their being taken too seriously, or they were ‘well-known problems’. The first and third examples concern routine monitoring; the second example is for a patient who had been stable in ICU for a few hours following a period in the Operating Theatre. The actions made were correspondingly quite casual - either conferring with other staff (a nurse asked a junior doctor), or making an assumption that the readings were wrong and needed correcting in some way. On other occasions, however, where readings were being taken in more clinically significant situations, the machine readings were treated with more seriousness in the first instance. The first example below was during an extended period where a Consultant and an experienced SpR were determining a plan of action for a patient who had been admitted in an emergency the previous day:

Consultant R comes back from the blood gas machine with various readings - discusses with N (SpR). N says “Is that true?” They move over to the left-hand side of the patient and seem to find some way of confirming that it is true... (Urban, visit 8)

Presumably the situation in this example was that although the reading seemed unlikely, it was a definite possibility and needed to be confirmed; it was also part of their determining the course of action. Unfortunately I did not have the skills to tell precisely how this ‘checking’ was done; but in the following two examples the means of checking were clearly visible:

(9:38am). R (Consultant) is called over to Bed 4 as the patient seemed to be having a heart attack... From the monitor, the patient’s heart rate appears to have increased up to 200 from 160, is causing a high-pitched bleep from the monitor. R says “heart rate not 200 is it” - more of a statement than a question. Later he explained to me that the apparent (incorrect) high heart rate reading was caused by a ‘high ST-wave’... The machine ‘thought’ that there were two heart beats when in fact there was just one. He checked with a stethoscope. (Urban, visit 15)

(Preparing for a transfer) The driver asks “are we ready for transfer?” F (SpR): “Nowhere near”... He tries to zero the instrument for measuring the blood pressure... the machine shows low blood pressure. F puts his hand on the patient’s wrist: “he’s got a bounding radial pulse” - so doesn’t believe it... (Metropolitan, visit 9)



The “bounding radial pulse”, as felt by the SpR, indicates that the blood pressure cannot be low. The use of the stethoscope and the hands-on checking of the pulse are highly indicative. While the stethoscope might be considered a form of medical technology, it is important to note that it is a purely analogue device. The ‘readings’ it gives are not transformed in any way: they are an amplified version of what would be heard if you put your ear against the body. It is therefore similar to the kind of unmediated reading as the hands-on checking of the pulse: unmediated data, requiring immediate interpretation by the practitioner. The doctors in these latter two examples (and I suspect the immediately preceding example too) trusted and privileged their own embodied skills over the advanced, mediated, digitised readings. Despite the ‘advances’ in technology, clinical skills remain highly embodied, both in the sense of the individual practitioners’ skills and in the sense of dealing with patients’ bodies.

We also see, from these data examples, that the general context of the reading informs the response. Where patients are stable, and the monitoring is routine, as in the first three data extracts (above, page 165), corrections may be made routinely. The fourth example came in the middle of an extended period of investigations by the two doctors, and unlikely readings needed to be confirmed to ensure appropriate therapy was decided upon. The final two examples were more serious: an emergency (a patient having a heart attack) and preparing a patient for transfer to a different ICU.

So far, then, I have shown how both the purpose of the equipment (recording, monitoring, diagnosis or treatment) and the immediate clinical context (routine or emergency) need to be considered when taking account of how ‘out of range’ values are responded to. Broadly speaking, the more routine the purpose of the equipment, the more its readings can be ignored. All this is related to equipment which is at some distance from the patient’s body, which “represents” what is going on in the body in some way. Machines can break down: the clinical information system going down; the blood gas machine giving spurious reading; a monitoring machine giving a “zero pulse”. All this can be managed by reverting to what might be called “older technology”; but importantly this older technology removes a level of mediation between the practitioner and the patient’s body.

Some equipment is very closely integrated with the patient’s body. These kinds of technology are not permanently ‘black-boxed’ (Latour 1987): they can be readily



ignored, re-configured or disassembled when a practitioner needs to get ‘closer’ to ‘clinical reality’. In fact, the body is more ‘black-boxed’ than the technology. For example, consider a quote from an early fieldwork visit (one interpretation of which I have already discussed in chapter five, pages 123-4):

During the ward round, Consultant G: “No-one understands the physics of high-frequency ventilation [all we know for sure is that it’s something to do with] the increased surface area.” (County, visit 2)

The first time I heard this statement, I understood “No-one understands the physics” to refer in a general way to the technological artefact. It is interesting to note, though, that it is specifically the human body’s respiratory system which is being ‘black-boxed’ here. “No-one understands the physics” refers to the effect on the human lung of the technological artefact, not to the artefact itself. The precise details of how the technology affects the lung are not of interest: again we can see that in practice ‘knowledge’ is important only in terms of action.

Monitoring the functioning of the human body is invasive and seems to be almost total. For example, there is a space on the patient’s monitoring form for recording the volume of liquids in and out. The body is all but hermetically sealed (not all fluids in and out can be recorded apparently, as ‘1-2 litres of saliva per day are lost’ - Consultant B, Metropolitan). But the level of detail of recording almost completely represents the body. An example of the extreme form of monitoring of the body which occurs in ICU, combined with close integration with the human body, can be seen in the frequency with which blood samples are taken. This is aided by a device known as an arterial line, or A-line, a tube inserted into a patient’s artery:

8.15am. P (SHO) was taking bloods... takes up to 5 minutes per patient... He explains to me how the A-line is very useful; an electrolyte measures the blood pressure instantaneously, so it is much better than a cuff. But it is also “handy” because it has a three-way tap so it is very easy to take bloods... “We have to take bloods 6-7 times per day for each patient. You need to know what the effect of a certain treatment or effort is... you can try something and see almost straight away whether it has the desired effect.” (Urban, visit 9).

Consultant R told me that the arterial lines were a taken for granted part of the ICU/HDU setting – the Pressure Transducer had been part and parcel of anaesthetics and surgery for a long time: he’d started medical school in 1979 and the technology had been around then... (Urban, visit 12).

The “pressure transducer”, used to determine the blood pressure, is to some extent a counter-example to my earlier point about how technologies in the ICU are not ‘black boxes’. It is a rather nifty piece of monitoring equipment, which has been stable in ICU, HDU and anaesthetics settings for well over twenty years. Part of its stability



might be due to its simplicity: it consists of a tube, inserted in the artery, so that the blood pushes up against an electrolyte enabling the blood pressure to be determined. The arterial line itself, although formally in existence to pass blood through to the pressure transducer, is positively evaluated as ‘handy’ by the junior doctor for a quite different reason. It enables blood samples to be taken at will for all kinds of reasons, for example determining the level of blood oxygenation or sending off for laboratory readings. The junior doctor explained to me that he had previously worked on a medical ward, where he had needed to take bloods separately each time. The arterial line’s three-way tap enabled blood to be siphoned off for testing, without needing to insert a needle “six times a day”.

My discussion of the material character of ICU has so far focused on machines and equipment. These can be classified according to an ordinal scale: *recording* patient readings; *monitoring* physiology; aiding *diagnosis*; and patient *treatment*. The data have also shown how equipment can be closely related to the human body. Apart from equipment which monitors and represents the body in terms of readings, equipment can be seen to adapt and alter the body, in order to make it ready for the clinical work of intervention and monitoring. However, machines are not relied upon implicitly, and practitioners often removed a level of mediation between themselves and a patient. I now turn to the ‘body’ more specifically, in terms of potential difficulties encountered in the treatment of patients’ bodies and the embodied skills of practitioners.

### The ‘technical challenge’ of the body

The material nature of the human body itself can affect treatment plans. The first of several examples about this shows how a combination of two ‘necessary’ treatments is not possible:

(Nursing hand-over): Sister K: ‘Bed 2 [name] – we talked to [the Consultant] – could we not dialyse him prone, but where his line is...’ (She looks at C, Charge Nurse for next shift, who shakes his head, indicating the difficulty)... She explained to me afterwards: the Consultant had asked if he could be dialysed prone i.e. lying on his front, but the line was at the top of the patient’s leg, which meant it couldn’t be done. “Clinically it looked as if he would need dialysis but the instructions were that the patient should be prone until 6-7am.” Prone implies improved breathing, and his breathing did improve over that period, but the dialysis was not done. (Urban, visit 10).

There is therefore a hierarchy of priorities for patients with one or more organs in



failure: if the patient is having difficulty in breathing it is more important that that is resolved than resolving a kidney problem (by dialysis). A somewhat sadder example shows how treatment can be made next to impossible by the body itself.

Day 1, 9.20am. Consultant R tells me they're just sorting out [patient in Side Room] – he's come out to refer to a BNF (British National Formulary). I went into the Side Room with him. The patient is breathing on a ventilator but is semi-awake and can communicate... M (Nurse) and N (SpR) are already there... N is working at right hand arm of patient; M is with him; R is at bottom of bed, looking at the notes... He switches off a beeping machine; he then starts to slide a tube down the patient's throat... explains to the patient that he needs to swallow... The tube is to get rid of some of the air in patient's stomach. The tube had got twisted in the mouth, they have to redo it... Getting bloody stuff out of the stomach - with a syringe... R checks something with his stethoscope. N writes in notes. M takes out the waste with a syringe, wearing gloves, pours into a cardboard waste bowl. R says "well done" (not sure who to – probably the patient)... R asks patient : is that more comfortable now? – the patient indicates slightly. N and R discuss something rendered problematic by the patient's neck problems...

Day 2, c. 2pm. I went to the Seminar Room – Consultant W was there: "I'm using the news as a refuge at the moment... extraordinarily difficult situation in [Side Room]". The patient needs dialysis, but he is obese and with a fused neck, can't lie flat, but looking "sick to death"...

c.6pm. I learnt that the patient in the Side Room had just died.

Day 3, c.11am. I had a chat with N (SpR), about the patient who had been in the side room. On day one, R and N were thinking about putting in a PA [pulmonary artery] catheter, but practical problems (patient's obesity) precluded it. The fluid from the patient's stomach was bloody, not gaseous. They had hoped to extract gas, but a different finding was that instead they found some old blood, so "we may have missed something". The case will be referred to the Coroner but in practical terms it makes no difference - they knew that heart failure was the cause of death.

c.3pm. (Grand Round) Consultant W: "I feel bad, well I feel half-bad because of technical difficulties", 'technical challenge in every way'. P (SHO): "Nightmare". (Urban, visits 8, 9, 10)

A lot of treatment in ICU does not 'rescue' patients: the average in-hospital death rate for ICU patients is 33%<sup>6</sup>. This begs the question, why does the Consultant feel particularly bad ("well, half bad") about this particular patient? I think the answer is to be found in that it was theoretically possible, within medicine's grasp as it were, to keep this patient alive. But his body (a combination of obesity and prior medical treatment fusing his neck) precluded the necessary treatment, and illustrates some of the implications of the materiality of the ICU. This was called by the Consultant a "technical challenge in every way". But it seems to me that to describe it as a *technical* challenge is to downgrade the nature of the problem (which might have been

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<sup>6</sup> ICNARC Case Mix Programme Database.



rhetorically useful for the Consultant concerned): it is rather a problem inherent in the natural world, that is the physical nature of the material world. The skills expected of the ICU medical practitioner are that he or she can implement ‘clinically indicated’ treatment(s) whatever the circumstances. We see here a continuing example of Freidson’s “clinical mentality”, and the necessity for medicine to be able to ‘try everything’. Also, this patient’s body was visibly (materially, literally and metaphorically) less pliable towards medical intervention. This makes it a “technical challenge in every way”. If the treatment can be commenced but then fails, there is much less scope for doctors to feel that they have failed. In this case, however, it was not possible to commence ‘clinically indicated’ treatments.

### Craft as embodied skills

In this section, I have so far explored the materiality of the ICU and demonstrated how the work of the ICU is intimately concerned with technology as well as bodies which are ‘treated’. In the *ad hoc* nature of dealing with machines and technology and the materiality of the working environment, there are similarities with ‘craft’ work. I now come to consider the embodied nature of craft-like, manual skills (skills which are required by nurses as well as doctors).

A simple example is in the way that tubes and wires have to be physically managed:

C (Staff Nurse) calls all the wires and tubes coming out of and going in to the patient “Spaghetti junction”. She goes to get a device which tidies them all up. (Urban, visit 15).

(6.0pm – transfer) G (Staff Nurse) says to patient “spaghetti junction” regarding all the wires... F (SpR) tells me ‘We need to be especially careful getting into and out of the vehicle - wires can get caught up etc.’... One tube got snagged as we were getting into the ambulance and the ventilator tube came out because it was too long. (Metropolitan, visit 8).

(7:45am) D (Staff Nurse) is fiddling with a catheter tube for her patient, to ensure that all the urine in the tubes trickled down into the bag at the bottom, presumably for the 8am observations. The urine gets stuck at various points in the tube as it is not a downhill gradient all the way down. (Urban, visit 26).

As one Consultant said to me,

“Book knowledge is background only for medicine... [It’s] 75% auto-pilot, 25% thinking on your feet... [It’s also] physically tiring - lot of legwork, using physical skills, manual dexterity.” (Urban, visit 15)



So clinical work (and this surely applies to nursing as well as medicine) is about doing work with your own body. Physical skills must be learnt, and manual dexterity enhanced, in apprenticeship fashion. This can be illustrated by a junior doctor experientially learning how to use a bronchoscope, a device used to examine and remove particles from the chest of patients who have respiratory difficulties.

The bronchoscopy. Tube goes in, down the throat, trachea, sucks out the “gunk” from the alveoli... Trachea - division - left and right, main bronchus, becomes bronchioles... M (SHO) asks W (Consultant) about where to stand – he says you can have either side or head approach “My respiratory colleagues do it from the head – the advantage is that left and right, you don’t have to transpose”; he himself does it from the side. Patient is paralysed, in case of cough. W flattens the bed to get the patient in position i.e. head facing upwards; he says “cardiac index is tremendous, urine low”... The bronchoscope has a handle, so you can adjust the direction. Put lubricant on the end, where there is also a torch/light, and presumably the camera, suction as well. M: “Tube is quite sticky”. W: ‘I’ll try the next bronchus’. He injects a syringe of a clear fluid (flush). W: “Come out on expiration not inspiration”. He uses sucker to clean around the mouth. Special controls to adjust the bronchoscope; M tries again, after W had had a go. There was a slight problem as one of the bronchi was at a funny angle. W is wandering around the bed, discussing what M should be able to see... To me there does not seem to be that much sputum or whatever. W says there is one rule for endoscopy [a more general term encompassing bronchoscopy], which is that you don’t rush if you cannot see where you are going. M finished and said that she thought it was a satisfying job, C (Staff Nurse) agreed, ‘[it’s] like when we do suctioning’... W says at the end you have to manually hyper-inflate the lungs, using the bag, about a dozen times. C is shaking the chest, they’re still trying to get up some of the sputum, should have got it up before. M asks how to document. W answers: “What you saw... i.e. ‘sputum plus plus. Physiology normal.’ ” This was M’s first go on an endoscope, although she says she has “witnessed thousands”. (Urban, visit 16).

The first time the SHO used the bronchoscope she had some difficulty going down one of the bronchi, this was because the bronchus went off at a right angle which is apparently unusual. She passed the bronchoscope to the Consultant who had been instructing her, who could be seen to have acquired superior manual skills since he commented that the bronchus *did* go off at a funny angle, yet continued with the bronchoscopy and managed to extract a sizeable volume of sputum (‘sputum++’). In addition, we can see how the Consultant gives on the job advice in terms both of what the SHO ‘should be able to see’ and various ‘rules of thumb’ (e.g. “come out on expiration not inspiration”; ‘the one rule [sic] is don’t rush if you cannot see where you are going’).

The junior doctors on ICU showed considerable enthusiasm for these kinds of technical jobs – witness T’s almost exasperated “I’ve witnessed thousands” (of bronchoscopies). The possibility of conducting another routine ICU procedure, the tracheostomy (where a tube is inserted in the throat to assist with breathing) was greeted enthusiastically, even



excitedly, several times by the junior doctors at ward rounds.

This illustrates the apprenticeship of learning to use machinery and equipment which interacts with a patient's body. In earlier examples we saw, by the response of ICU staff, that they must have learnt (somehow) all about the various types of monitoring equipment (*e.g.* turning off an alarm; correcting a reading; the blood gas machine giving spurious results). These abilities must be learnt on the job.

ICU staff must also learn, on the job, not only about how equipment interacts (sometimes erroneously) with the human body, but also how it interacts (sometimes erroneously) with other equipment. The first example of this is from interview data, where I was interested in finding out about the “manual correction of a trace” (as noted above, page 165):

SC Have there been occasions when the trace is wrong and you have had to correct manually...?

E (Sister): Yes... we just use central venous catheters, just have three lumens<sup>7</sup>, triple lumens and CVP [Central Venous Pressure] measurement. We use that sometimes to administer antibiotics or fluids or whatever and so when the two infusions [are] going at the same time, it will say that somebody has Central Venous Pressure reading... [of] something ridiculous like 350 which isn't achievable... so the computer will read it as that, because that is what it is saying on the monitor and so you have to amend it and put in the correct measurement when the two fluids aren't going. So that it is truly a CVP measurement

SC So you have to wait 'til this has calmed down?

E Yes – you can just switch off the infusion, do a reading, and – you know – amend the [clinical information system] and then restart your infusions...

(Interview, Sister, Metropolitan)

This extract shows how two different pieces equipment can sometimes interact; consequently the ICU staff have to engage in ‘work-arounds’ which somehow have to be learnt about. In this particular example, the reading “isn't achievable”, which makes the contextual response, in principle, quite straightforward. In practice, however, it can be seen that some considerable effort is required (switch off the infusion; do a reading; amend the clinical information system; restart the infusions).

A second example concerns a particular haemodialysis machine which, when in operation, made heart activity monitor readings look like the patient was having a heart attack (see Figure 6.1, page 173). The heart monitor produced a warning:

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<sup>7</sup> Lumen: a line that has a tube in it. So ‘three lumens’ or a ‘triple lumen’ means three lines, each transporting a different fluid or drug into the body.

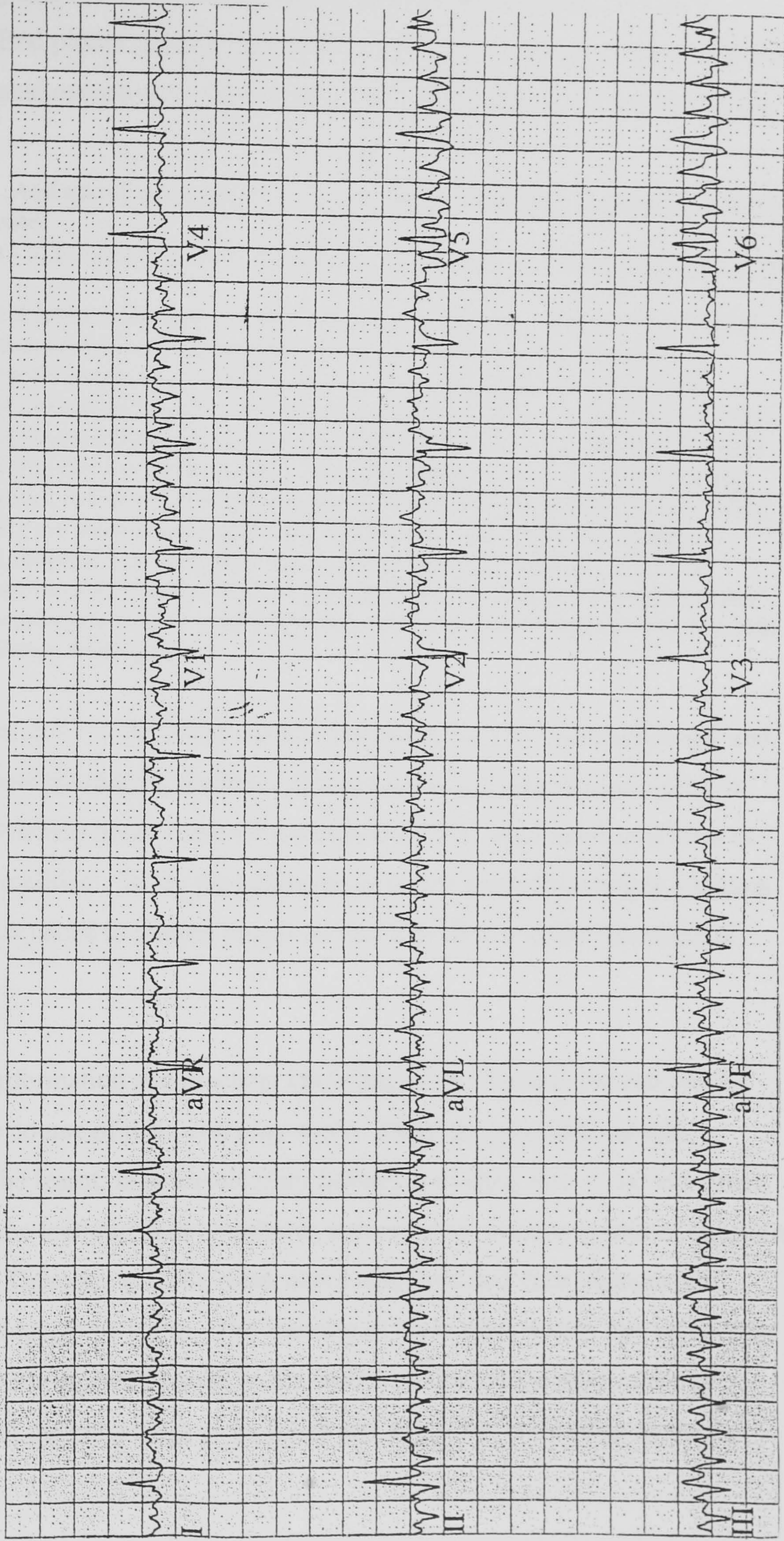


Figure 6.1 Haemofiltration machine and ECG trace interference

Vent. rate 98 BPM  
 PR interval \* ms  
 QRS duration 63 ms  
 QT/QTc 358/457 ms  
 P-R-T axes 93 49 10  
 BP 125/58

Unconfirmed

UNDETERMINED RHYTHM  
 NONSPECIFIC ST AND T WAVE ABNORMALITY  
 ABNORMAL ECG





“Undetermined rhythm; nonspecific ST and T wave abnormality; abnormal ECG”. When this had occurred one night, the Consultant suggested on the ward round the following morning that one of the junior doctors send it in to the *British Medical Journal* for their ‘End pieces’ section (to my knowledge none of them did so), so it was admittedly an unusual occurrence. The Senior Nurse told me how the staff dealt with this too:

E (Sister):...And one of our haemofiltration machines can sometimes interfere with the ECG trace.

SC How is - is this one? [Showed a copy of trace, Figure 6.1] I was going to ask about that.

E Yes, so it looks as though someone’s in irregular rhythm – atrial flutter or atrial fibrillation and it is just interference from the haemofiltration machine.

SC And how do people know about that now? How are people aware that’s -?

E It is just reminding people... It seemed more of a problem – in that there was one instance where somebody was going to treat the rhythm... but the rhythm didn’t exist, it was just interference. So it’s just making sure that it’s into the training programme, and orientation and the mentorship within the nursing staff and then hopefully the same thing within the medical staff. And I have a tendency to remind people if I see a Prisma - the machine’s called a Prisma - so if I see somebody on a Prisma and I am on the ward round I will say ‘do you remember’. So hopefully you know – everybody does have that at the forefront of their minds.

(Interview, Sister, Metropolitan)

So, on one occasion, ICU workers had actually responded to this ‘erroneous trace’ and “somebody was about to treat the rhythm”. It is clear that ICU practitioners need to become skilled in learning about these idiosyncrasies of ICU equipment, and learn to ignore such ‘abnormalities’. In the meantime, more senior staff (for example, mentors and the Senior Nurse) need to remind people so that they have it at the “forefront of their minds”.

A whole range of information and practical knowledge must therefore be retained by ICU workers in the course of their everyday work. There are practical, manual, embodied skills to be learnt, in apprenticeship fashion, including how to use machines. But on top of this, the learning about machines encompasses when to ignore or question machine readings. There are specific rules, about machines and their idiosyncratic interactions and foibles, to be learnt. The learning of these rules relates this section, on the *interaction with the material world*, to the earlier section on the *application of knowledge*. Some of the knowledge to be learnt and applied is knowledge about the material world.



## Summary: practical reasoning, practical skills

I have discussed craft under the headings of the *application of knowledge* and the *interaction with the material world*. I would like to add, although my data on this are less explicit, that my impression was that the forms of reasoning in ICU bore great similarity to that of a craftsman. My comparison with a craftsman's 'on-the-job thinking' came from assisting a plumber on an emergency job one day. The plumber in question, although he had an original plan, had to constantly reformulate it and come up with solutions to new problems as they arose. For example, there were discrepancies between old piping and new piping: the old was made of lead and sized in imperial whereas the new was made of copper and sized in metric. This kind of problem, and the formulation of possible solutions, was similar to a scene on ICU early one evening:

Consultants R and B are talking about the nebuliser - a device for delivering drugs in vapour form, it makes little droplets. Problem is if you have long ventilator tubes with corners the droplets condense at the side and so the effect of the drug can be lost. Problems include: different sizes of tubes (15mm, 12mm) for the connections; right angles at various points; nebuliser itself has to be horizontal but other bits (e.g. going in to the mouth) are vertical. J drew a diagram on the board. R 'summarised' it for me, then for P (SHO) and E (SpR) as they came in. The 'best option' was considered to be getting the nebuliser as close as possible to the intake of oxygen. P joked "get in your garage then B", who then waxed lyrical about how they used to have a workshop next to ICU, which evolved into the medical equipment department. 'In those days we had to do it ourselves - the alternative was the engineers and you know what they're like' - mimicked using a sledgehammer to crack a nut... (Urban, visit 22)

Not only is the material nature of these two problems similar, but for ICU doctors as well as for a plumber the assumed approach involves formulating plans (as I discussed in chapter five), predicting problems, yet still facing unforeseen problems.

In summary, then, the *application of knowledge* as been seen to consist of prompt, often immediate interpretation of all kinds of 'evidence', including non-written information and machine and laboratory readings. This interpretative element indicates the importance of context. Non-written evidence, including biographical information about the patient, is part of the overall clinical context. It can become incorporated into clinical judgements and the medical notes. In addition, formal, scientific knowledge was not observed to be particularly relevant to the routine work of ICU practitioners. Written knowledge is only held to be useful if it is data-base type information, for example, the British National Formulary or a specialist guide to dialysis – data and information that can easily be codified. By contrast, text-book knowledge, learnt at medical school seems to be hardly referred to again. It is assumed to be somehow



internalised and embodied in the practitioners themselves.

We have also seen that ICU workers demonstrate considerable skills in the material world. This relates both to their practical work with machines and bodies and the embodied manual skills they learn. They were common to many of the doctors in ICU, who had a characteristically hands-on approach. In treating the body, older technology (for example, the stethoscope) came to the fore and tended to be relied upon more implicitly than high technology monitoring equipment. Furthermore, ICU practitioners developed their knowledge about medical equipment and technology in an apprenticeship manner.

These features of medical work in the ICU make it resemble a craft, in both its practical, action-oriented approach and in the manual skills which are learnt and utilised. Both these aspects of 'craft' are related to knowledge in practice. In the latter section of this chapter we have also seen how ICU nurses also require many of these craft-like skills. In the next chapter I focus more specifically on intensive care nursing knowledge and practice.



## Chapter Seven

### Nursing Perspectives in Intensive Care

In the last chapter I argued that medical work, at least in the ICU, is best characterised as a ‘craft’, that is the application of medical knowledge entails continual interpretation and the work itself entails close interaction with the material world. Some of the data presented towards the end of that chapter demonstrated how nursing work also required material skills. In this chapter I consider the character of nursing work more closely, with a focus on how nurses use knowledge in practice.

Given that my earlier discussion of medical work constructed it largely independently of nursing, I wanted to start by presenting a ‘symmetrical’ account of nursing work in the ICU, considering those parts of the work which occur independently of medical doctors. This approach proved difficult to sustain, however, as my analysis led me to the conclusion that intensive care nursing is largely a biomedical enterprise, and that medical and nursing workers in the ICU share an overwhelmingly common view of the health care they provide. This led me to consider nursing and sociological theories, which tend to compare nursing with medicine, either implicitly by seeking to differentiate nursing from medicine, or explicitly by examining the subordination of nursing to medicine (May and Fleming 1997). In this chapter I therefore examine the similarities and differences between medicine and nursing in the ICU, provide an explanation of the degree of difference, and present a detailed analysis of the situated relationship between nursing and medical perspectives, work and knowledge in the ICU.

In the first two sections of this chapter I prepare the ground for developing an understanding of the meaning of ICU nursing by reviewing some of the sociological and nursing literature, concentrating first on how nursing theories have been translated to the ICU and second on sociological studies which have analysed intensive care nursing.



This sets up three problematics. First: what is the knowledge base of ICU nursing? Second: in what ways is ICU nursing different from ICU medicine? And third: what is the most plausible explanation for any differences? I provide answers to these questions, based on my own data, in later parts of this chapter: in the third section I examine the knowledge ICU nurses explicitly use, and in the fourth and fifth sections I examine differences and similarities between nursing and medical work in the ICU. In short, I found fewer differences than might have been predicted from some of the sociological and nursing literature. I consider several possible explanations for the kind and degree of such differences as I found to exist. I conclude that the most plausible explanations are to be found in the social organisation of the ICU, and the physical location of the ICU as a well-defined organisational sub-unit of the modern hospital.

### **Nursing's contribution: 'care'**

If nursing does make a distinctive contribution to health services, this is articulated by both nurses and doctors generally as an emphasis on 'care', rather than treatment or 'cure' which are held to be in the medical domain (Walby *et al.* 1994). Walby and colleagues (*ibid.*: 45-6) pointed out some analytical problems with such a distinction, for example, that the difference is historical rather than functional; the boundary between them is constantly changing or is 'fuzzy' (they gave the example of wound care); and one cannot occur without the other (for example, prescribing and giving drugs). Furthermore, if nurses claim a "monopoly on caring" (James 1992: 97), this suggests an acceptance of the notion medicine does not have to bother about caring, a position which once stated appears indefensible.  
(Walby *et al.* 1994: 79)

The care-treatment divide has rhetorical uses, is flexible and can be altered to suit different specialties. As such, it tends to be prescriptive rather than either descriptive or explanatory.

In principle, nursing theory ought to be able to provide more analytically useful conceptions of nursing and, if necessary, the relationship with medicine. But nursing theory has also been subjected to the criticism that it is too prescriptive. For example, Miller (1985: 420) referred to nursing theories as "idealised perfections", while Porter (1992a: 722) commented that "the theoretical construction of the occupational position



of nurses [outstrips] reality”. May (1990: 312) wrote that nursing research

which relates the action of the nurse at the bedside to prescriptive ‘ideal types’ of nursing... only makes sense if nursing practice is also predicated on it.

He commented that for nurse-patient relationships (his substantive area of interest), there was an increasing disparity between what was achievable in theory and in practice.

There is, unsurprisingly, an uneasy relationship between sociology and nursing (Allen 2001a), which can be explained by their differing purposes. Sociology is concerned primarily with theoretically and empirically adequate explanation, while it might be considered appropriate for nursing, as a pragmatically oriented discipline, to contain a degree of prescription. In my analysis of what ICU nursing, I will comment not so much on how far nursing practice falls short of any particular nursing theory, but rather on how nursing theories appear to miss important aspects of the nursing work as I observed it. In brief, the main criticisms of nursing theories are that their relationship(s) with nursing practice are poorly specified. However, Walby and colleagues’ (1994) criticisms of a ‘care-treatment distinction’ do not necessarily preclude it being a valid distinction altogether. We need, though, to be able to relate nursing ‘theory’ to nursing practice. So, in my reading of nursing literature I generally took the reports of empirical studies as valid. However, in the light of my analyses, I offer what I consider to be plausible re-interpretations of the implications, thereby taking a ‘constructively critical’ approach to theories propounded in the nursing literature.

Contemporary nursing ideology, its occupational licence and its mandate are founded on a “unique holistic approach to care in which nurse-patient relationships are central” (Allen 2001a: 389). The holistic approach, that is, caring for the patient’s mind, body and spirit as a unity, warrants the nurse’s position as “advocate” for the patient. Allen further commented that

in the more mystical versions of nursing work, it is claimed that nurse-patient relationships have therapeutic value and are the means through which nurses assist patients in finding meaning in their illness experiences. (*ibid.*: 389-90)

The way that nursing theories have been applied to the ICU (and I come to specific examples shortly) have attempted to translate the concept of holistic care, and the centrality of the nurse-patient, relationship to ICU nursing. ICU nursing has then been ‘found wanting’ in some way. An alternative approach, to accommodate the ‘deviant case’ of ICU nursing, could be to modify or develop the theory itself.



In considering nursing theories, I tend to agree with Miller (1985: 420) that they can be so all-purpose, so all-inclusive and so abstract that in trying to explain everything they explain nothing.

‘Holistic nursing’ and its variants might well be guilty of homogenising nursing work and experience, in what is a very differentiated occupation. For example, a generally important area of nursing research would be nurse-patient interaction. But in the ICU, where patients are usually sedated and unconscious, there is much less scope for nurse-patient interaction. The analysis I present therefore addresses this issue by making a contextualised and situated analysis of ICU nursing, rather than attempting to explain nursing in general.

Notwithstanding the problematic relationship she identified between sociology and nursing theory, Allen (2001a: 390) claimed that “nursing experience and a sociological eye can be brought together with powerful effect”. This tends to be in cases where nursing research has taken an empirically grounded approach to theory building (May 1990). An example is James’ (1992) exposition of care, work and carework. She commented how

Caring has become a foundation philosophy of nursing in diploma and degree courses so that future generations of nurses will perceive ‘care’ as being fundamental to their craft and the services they offer. (*ibid.*: 97)

James’ findings confirmed that ‘care’ was perceived by nurses as ‘fundamental’ to their working lives. Although nurses’ descriptions of care “tended to be imprecise”, taken together they implied

a personal, thoughtful, patient-centred approach... [and] skills... such as ‘listening’, ‘being there’, ‘being involved’, ‘spending time’, ‘doing the basics plus extra’ (*ibid.*: 104)

In addition to what James called ‘empathetic understanding’, nurses included “techniques of assessment and intervention” within the rubric of ‘care’, which is to say that ‘care’ encompassed both understanding needs and the means of meeting those needs. Her research thus helps to ground the ideology of ‘care’ and to clarify the concept of care in nursing work: that it includes both ‘technical tasks’ and skills associated with ‘empathetic understanding’.

Later in this chapter, while I question ‘care’ as a ‘unique nursing perspective’, my main emphasis is that the nursing theories have been neglectful of certain important aspects of the work of ICU nurses, *including* their work of caring. Emphases on nurses ‘caring



for the whole individual' seek to differentiate nursing from medicine in health care in general, but I question how far these ideas can be properly transferred to the ICU. My main problems with the nursing conceptions of 'caring' as applied to ICU are that they de-emphasise the bodily aspects of health care, over-emphasise a supposed problem with medical technology, and neglect ICU nurses' interactions with patients' relatives. Nursing commentators' attempts to translate 'unique nursing perspectives' to the context of ICU still, as Porter (1992a: 721) commented, seem to elide "ideological statements and material reality". From a purely nursing perspective this need not be construed as a criticism, since nursing as an applied, pragmatic, discipline probably requires value-laden theories for educational purposes (Allen 2001a). But it does create some difficulties for empirical attempts to analyse the 'reality' of nursing work.

The attempts to integrate holistic nursing (or any of its variants) with ICU nursing tend to identify a 'problem' with the 'dehumanising technological environment' resulting in a 'failure of true nursing care'. Alternatively, they misrepresent ICU nursing and, in the process, miss the very aspects of nursing which would fit with nursing's own normative conceptions. Indeed, the way that 'caring' was articulated in theoretical accounts of ICU nursing led me at one stage to feel that I had not gained sufficient rapport with the nurses to "understand caring", but on reflection I do not consider this to be case. I observed that nurses seemed to 'care' for patients' relatives, and ICU nurses invariably articulate the caring aspect of their work in terms of "looking out for relatives, keeping them up-to-date with what's happening, being honest with relatives" (Charge Nurse, Urban), rather than the 'holistic nursing ideology' of a therapeutic nurse-patient relationship which is common in the nursing literature.

An example from the nursing literature is Woodrow's (1997) articulation of 'nursing perspectives for intensive care'. He argued that nurses

have a potentially unique contribution to care, focusing on the patient as a whole person rather than intervening to solve a problem. The need for both physiological and psychological care creates a need for holistic values. (Woodrow 1997: 151).

The nursing values of holistic care, incorporating psychological care, which Woodrow alleged are missing from a medical or technological perspective, mean that the nurse can care for both physical and psychological needs, complementing "the valuable physiological care that is offered by other professions" (*ibid.*: 153). However, when it



comes to specifying ‘nursing care’, the recommendations are rather non-psychological, as Woodrow listed the following as fundamental aspects of care:

analgesia and sedation...hygiene... eye and mouth care; pressure area care... and monitoring the effectiveness of drugs used (such as through pain and sedation scoring). (*ibid.*: 153)

This attempt to adapt ‘holistic nursing’ to intensive care, in the end, neglects both the psychological and the social. This is not altogether surprising, since in intensive care a ‘holistic approach’ necessarily focuses on bodily systems and problems: almost three-quarters of the textbook *Critical Care Nursing: a Holistic Approach* (Hudak *et al.* 1998) described “alterations in body systems” and “multisystem dysfunction”<sup>1</sup>. My argument so far is that the theory of holistic nursing (encompassing mind, body and spirit) is difficult to apply to ICU.

Beeby (2000a) identified some of the problems with transferring definitions of nursing care to the ICU. She highlighted that discussions of nursing care usually emphasise the interpersonal relationship between nurse and patient, that the nurse is a co-participant in healing, that the patient is an autonomous being, that a caring environment offers the development of potential while allowing the patient to choose the best action for him or herself at a given point in time. Nurses should have knowledge of the caring values, beliefs and practices of the patients. With adroit understatement, Beeby (2000a: 78) commented:

The appropriateness of this in intensive care is difficult to ascertain. Implicit... is that the patient is autonomous and that he or she can articulate a personal point of view. The reality of intensive care is that the patient is often in a completely dependent state, unable to speak and make choices.

Rier (2000), in his account of being a patient in intensive care, confirmed that he was unable to make decisions and was in a completely dependent state. In Beeby’s own empirical study, however, she found that nurses “participated in three types of caring, involving physical, technical and emotional labour” (Beeby 2000b: 151). Importantly, her respondents identified caring for the family as part of their work, and this was sometimes included within a rubric of holistic patient care. Beeby also observed that ICU nurses regarded activities such as biophysical monitoring as care.

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<sup>1</sup> The detailed breakdown is as follows. Of 50 non-introductory chapters, 32 are on body systems (cardiovascular, respiratory, renal, nervous, gastrointestinal, endocrine, haematological), four on multisystem dysfunction; two concern legal and ethical issues, five concern patients and relatives, five concern ‘special populations’ (pregnant women, children, older patients, post-anaesthesia patients, patients needing transport).



Walby and colleagues (1994: 46) noted that for intensive care

... staff locate the care-treatment boundary very differently. Medical staff are dependent on nurses extending their responsibility into areas previously considered to be medical.

Whereas (non-nursing) social scientists can comment that in ICU the “care-treatment boundary is located very differently”, non-ICU nursing commentators sometimes find nurses’ ability to provide care can be seen as being rendered problematic by the technological nature of ICU. M. Cooper (1993) commented that the nursing emphasis on care can be rendered paradoxical in ICU by the presence of technology, since the nurse may identify with

the values imposed by the technology at the expense of acknowledging her own and the patient’s vulnerability... the dominance of technology renders many experiences of care invisible or at best obscured. (M. Cooper 1993: 23-4)

However, we should note that James (1992) stated that care is difficult to observe in any case (and she was researching a hospice, an environment where one would expect care to be most easily observed). Now, particularly if patients are conscious, I would not want to deny that being hooked up to machinery would be alienating<sup>2</sup>. But I do think that there are factors other than technology which can render the environment alienating. Cooper’s own study described the busy-ness of the ward, for example, the noise of the machines; and the ICU she studied was a cardiothoracic ICU, with a possible rapid throughput of patients following elective surgery. With a higher throughput of patients the ICU would be noisier, as it is at the time of admission that there is more general activity and beeping noises from monitors before the patient is settled into the ICU bed. Furthermore, cardiothoracic patients are more likely to be conscious than general intensive care patients. So while technology is said to undermine ‘nursing care’, other aspects, common to hospital environments in general, could also be said to undermine the imperative to care. I also think it is important to note that the ICU nurses in Cooper’s study did not experience technology as at all ‘paradoxical’:

from the perspective of these nurses, competent technological management constituted a major form of care. Nurses spoke of care and competence in tandem, equating care with saving lives. (M. Cooper 1993: 26).

Likewise, Heskins (1997) drew attention to technology’s benefits for nursing and to its integration with care. She commented that in addition to medical advances “saving

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<sup>2</sup> But not, apparently, to all patients. Seymour (2000:1241) reported the widow of an ex-ICU patient: “I mean [he] would have loved it, being attached to all that machinery, he loved all that sort of thing...”



lives”, added benefits of some technology (which she noted are rarely mentioned in the nursing literature) are that it can enable patients to rest without interruptions from staff, and can free up nursing time. Groen (1995: 132-3) also found that, contrary to the expectations she had derived from the nursing literature (which she later characterised as normative), ICU nurses did not experience a “conflict between care and technology”. Rather, ICU nurses “hold a concept of ‘care’ in which ‘technology’ is incorporated”.

Walters (1995) had also emphasised the ‘unity’ of care and technology. He confirmed that nurses in ICU need ‘technical competence’ or ‘competent technological management’, and argued that the technology is conceptualised as a necessary part of the caring processes of nursing. He quoted one of his interviewees:

‘It is hard to divorce the technology from the caring. The technology is incorporated into caring... The monitors are giving you information which you use in caring.’ (Walters 1995: 495)

Walters summarised by saying that the

mechanical technological function becomes embedded in the caring human processes that are central to the task of nursing. The intensive care technology, therefore, must be viewed as a component of an interconnected pattern of integrated nursing activities. (*ibid.*: 495)

The need of nursing to develop a sense of coherence and unity about its work seems to me to be perfectly legitimate, but to characterise this as based on ‘psychological’ values (Woodrow 1997) is not appropriate for the ICU (Beeby, 2000a). Indeed, the rhetoric of ‘psychosocial holistic care’ *may* allow the patient to be construed as a ‘psychosocial being’ as well as a physiological one, but it has emphasised the patient’s ‘mind and spirit’ and thereby tended to omit the social. What has happened is that the emphasis on the nurse-patient relationship, sometimes seen as intrinsically therapeutic (May 1992, Allen 2001a), has neglected the other (social) care which ICU nurses do. The issue of technology and care being unified is also of interest. It shows, perhaps, a need for a profession to unify seemingly disparate activities. But the perception that these activities are disparate, and even opposed, is even more interesting – what is it about technology that it is seen to be a bad thing? I think the answer is that it is inimical to the holistic care variant of contemporary nursing ideology. From an analytical perspective, the problem is, I think, over-stated and mis-applied. For in specifically *nursing* studies such as those of M. Cooper (1993) and Walters (1995), the unit of analysis is still the nurse-patient dyad. But empirical studies of ‘caring’ in the ICU have shown how ICU nurses themselves have a more social conception of caring than the nursing theorists,



indicating that a more analytically productive unit of analysis might be nurse-*patient's relatives*.

As a final point, Heskins (1997) studied caring, gender and technology, and although she did not conceptualise caring relationships with patients' families, these issues were clearly apparent in the interview data she collected:

The item most frequently recognized in relation to caring was the family... Methods used to care for the family included being involved with them and chatting to them... keeping them up to date with the patient's progress and encouraging them to express their concerns (Heskins 1997: 67).

The nursing literature, therefore, has attempted to adapt an ideology of 'holistic nursing' to ICU, and this attempt has been unsuccessful for two main reasons. First, the theories have neglected *social* aspects of nursing work. Second, they have been inclined to oppose work related to technology or physiology to *care*. There is an irony that these aspects of nursing work do not seem to have been properly featured in theoretical accounts of ICU nurses, although they do feature in ICU nurses' accounts of their practice.

### **Sociological conceptions of intensive care nursing**

The foregoing digression into the nursing literature enables us to see the implicit influence of nursing ideology on two sociological accounts of nursing knowledge in the ICU. It appears to be the contrasting reactions to 'nursing ideology' which contributed to a marked difference between the two accounts. Zussman's (1992) chapter on nursing criticised particularly the notion of patient advocacy (itself a development of holistic nursing), and concluded that ICU nurses "have become 'mini-interns'<sup>3</sup>... technicians" (p.80). By contrast, Harvey stated that ICU nurses develop, through experiential knowledge and caring work, a "radically different epistemology to that of doctors" (1995: 775; 1997: 728). These views cannot both be correct, and it is my argument that neither is, since both have failed to explicate adequately nursing knowledge in practice. The different interpretations each offers can also be partially explained by the different organisational context, as highlighted in my discussion of each, below.

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<sup>3</sup> Interns: junior doctors.



Zussman articulated what he called a dilemma for nursing ideology. On the one hand, nurses' distinctive role is said to be that they are

more concerned with the social and emotional aspects of illness than are their more narrowly technical counterparts, the physicians, and effective advocates for more humane treatment (Zussman 1992: 64).

The notion of advocacy is said to be an expectation that nurses, because they provide hands-on care, know "patients and their families better than do doctors... [or] in ways the physicians do not" (*ibid.*: 68-9). According to Zussman, however, ICU nurses, in a claim for high status relative to therapists, technicians, or non-ICU nurses, emphasise their technical skills. These technical skills earn nurses respect from ICU physicians, but - and this is "the fundamental dilemma for nursing ideology" - once these technical skills are emphasised, there is then little rationale for challenging the physicians who are themselves, according to Zussman, making 'technical' decisions.

Now it may be the case that nurses are valued by physicians (and hospital administration) for their technical skills, but this does not necessarily imply that this is their own perspective. Zussman's critique of nursing ideology is not the same as saying that nurses in the ICU follow that ideology, and only a few nurses were reported as expressing the views that he criticised. Zussman commented, for example, that when he asked nurses in what ways they 'know patients better', they answered that it means knowing their anatomy and physiology, not to know their "hopes and fears". This is, perhaps, a valid criticism of the nursing ideology of 'holistic care'. However, as Walters (1995), Heskins (1997) and Beeby (2000b) have shown, ICU nurses (at least in Australia and the UK) articulate their conception of 'nursing care' to include 'physiological caring' and caring for patient's relatives. It was not the ICU nurses who mentioned "knowing patients' hopes and fears".

One explanation for Zussman's findings could be in the organisational differences between his ICUs and ICUs in the UK. In his, the nurse-patient ratio was 1:2 (Zussman 1992: 64); ICUs in the UK are defined by a 1:1 nurse-patient ratio. ICU patients in the UK are sicker and therefore there is little patient interaction (although this can occur intermittently if sedation wears off and patients 'wake up', or are less sick, or are getting better). Furthermore, the ICUs in his study appeared to be 'open units', where the medical staff making decisions were not permanently attached to the ICU. So it may be that in ICUs in the US nurses appear to be 'mini-interns'. In the UK, although



the patients are sicker and have become non-social ‘bodies’, needing biophysical monitoring and physiological care, the ICU nurses have more time to perform social care related activities, especially with regard to the care of relatives, as well as developing their technical skills.

In summing up, Zussman (1992: 80) stated that

Nurses... are not patient advocates... Like physicians, they have become technicians.

It will be clear from chapter six that I disagree with this statement: insofar as intensive care medicine is a technical enterprise, it additionally features skills of interpretation. What of nursing? In my view, nursing can be characterised as technical work with additional features of social interaction. The advantage of such a formulation is that it recognises a different perspective and contribution of nurses to the work of ICU, but does not make empirically naïve (though sometimes “theoretically sophisticated”) assertions regarding some kind of mystical contribution that nurses are supposed to make to the care of patients.

In my view, Harvey (1997) tended to such an approach. Making a rather selective interpretation of an earlier study by the sociologist Anspach (1987), which I come to shortly, she commented:

Intensive care involves one-to-one patient care, such that the ICU nurse spends the entire shift at the bedside with the patient (and their relatives – who often maintain a vigil in ICU). ‘Experiential knowledge’ based on caring work... is, therefore, gained by the nurse. This results in their developing a radically different epistemology to that of doctors [Anspach 1987] and this was reflected in many of the differing views put forward by doctors and nurses concerning appropriate care of the dying in Intensive Care. (Harvey 1997: 728)

The statement that nurses have “a radically different epistemology” from doctors is a big claim, and therefore warrants substantiation. However, close inspection of the data on which this claim is based, in particular a discussion concerning the death of a child on ICU, where “doctors and nurses held different views on the withdrawal [of treatment] process” (*ibid.*: 727), raise doubts as to its validity. The key data are the comments of a Consultant Anaesthetist who said that the doctors and nurses involved were all “happy that treatment was withdrawn”, even though the child “fulfilled the criteria of brain stem death in no way at all”. The point of disagreement was that the doctors wanted to

‘allow him to settle down peacefully on the ventilator, give him some



painkillers, let him sedate, let him drift off to sleep. Nice peaceful death. [However], the nursing staff felt that this was such a protected way to die with the parents around, that they were insisting he was extubated, that the tube was taken out and that he was allowed to sit in the arms of his parents and die that way.' (Consultant Anaesthetist, quoted in Harvey 1997: 727).

The Anaesthetist then described how one of the ICU Consultants “had a lot of heart-ache over it” and the nursing staff were also upset. But the resolution was that “they had to do what the consensus of medical opinion says because they are the people in control of the problem.”

Harvey’s first interpretation of this event emphasised the legal position of doctors, which seems to me a rather more plausible explanation than “radically different epistemologies”. If, indeed, nurses and doctors did develop “radically different epistemologies” then meaningful discourse in the ICU would not be possible. My contention, as I argue in the later sections of this chapter, is that, if anything, the epistemological bases of ICU nursing and ICU medicine have moved *closer* than nursing and medicine generally.

A possible explanation of the difference between my findings and Harvey’s is in the different medical management structures. All the ICUs I visited were ‘closed’ units (as are around 80% of British ICUs – Audit Commission 1999: 35). ‘Closed’ units are where there is a dedicated ICU medical team which takes over responsibility for a patient; this is in contrast to an ‘open unit’ where the admitting team retains responsibility for the patient and the ICU doctors merely ‘advise’ (a continuation of anaesthesia’s service relationship to surgery). The upshot of an ‘open’ ICU is that the medical team who are responsible for making a treatment withdrawal decision are not ICU doctors, and perhaps see no reason to involve the ICU nurses in the decision. This seems to have been the medical structure in Harvey’s ICUs.

Heskins (1997) and Melia (2001) noted that ethical decision-making around whether certain patients should be treated in ICU, and for how long those patients should receive treatment, is an area of concern and sometimes dispute between doctors and nurses. But Melia (2001: 107), while arguing that the medical and nursing perspectives are often at odds, noted that

when the social context of clinical practice is taken into account... there is common ground between the two professions... The differences of opinion which arise over the decision to withdraw are not simply to do with the way in



which the situation is experienced by each professional group, proximity to the patient had a part to play in shaping... views.

Melia's study draws attention to the way that physical (or geographical) factors – proximity to the bedside – rather than separate professional perspectives might affect personal viewpoints. In the light of these observations, it is worth noting that Harvey's reading of Anspach (1987) was selective, and Anspach was rather more careful in her own paper. Anspach herself posited the neonatal ICU as an "organisational ecology of knowledge", and she discussed "prognostic conflict" between doctors and nurses in neonatal intensive care. She found that physicians and nurses "differ systematically in their views of infants' prognoses". But the systematic difference is not necessarily a difference in epistemology, since according to Anspach nurses and doctors agreed on the principles involved in 'life and death decisions', and agreed on many of the 'cues' they claimed to use in considering neonates' prognoses.

Anspach analysed doctors' and nurses' comments about the cues they would use to "tell if an infant is doing well or poorly", and found that both doctors and nurses equally used *technological cues* (any information which is obtained by diagnostic technology) and *perceptual cues* (information gathered through direct perception of the patient, including palpation, percussion, and, most commonly, observation). However, she found that a larger proportion of nurses than physicians mentioned *interactive cues* (information which arose out of the social interaction between patient and practitioner) in their responses.

Anspach went on to argue that

These contrasting and 'partial' views of reality are rooted in the culture and social structure of technology-intensive medical settings... The organization of the intensive care unit structures the perceptions of those who work within it. In particular... the decisions of health professionals are shaped by the practical circumstances of their work... members of the nursery staff, because of their differing work experiences, may arrive at conflicting conclusions about the prognoses of infants whose lives are in question (Anspach 1987: 215-6)

It is the work context which results in the differing perceptions. The doctors and nurses share much of the same data, but have differing views of the future implications of that data.

For the attending, the dilemma is one of profound prognostic perplexity; for the nurses, the dilemma is one of continuing to care for an infant whose "unsocialised" behaviour provides them few rewards. (*ibid.*: 226)



Anspach's findings can be interpreted in a number of ways, and I acknowledge that the phrase "organisational ecology of knowledge" is compatible with "radically different epistemologies" (Harvey 1995, 1997). However, taking a lead from Melia (2001), my point is that Anspach's findings are consonant with, and more parsimoniously explained in terms of, the social organisation of the neonatal ICUs she studied, rather than being construed as a difference in epistemology, the reinterpretation proffered by Harvey.

In more general terms, it has been argued that the "time-space geography" (Walby *et al.* 1994: 92) and the differences in "territories and spatial occupancy" (Snelgrove and Hughes 2000: 664) of the modern hospital presents the most tensions between medicine and nursing. Nurses' geographical restriction to a ward (as compared with doctors' territory of the hospital), may lead to

more intensive contact with patients and thus more knowledge of their conditions and personal circumstances. (Snelgrove and Hughes 2000: 664)

These are important observations, and seemed to me to be suggestive of ways of looking at my own data. In the ICUs I visited, nurses and doctors were *both* associated with the 'ward' (i.e. ICU). This in turn means that doctors and nurses work closely together, in a well defined organisational unit, and as they do so it seems plausible that they start to share similar perspectives and viewpoints. For both doctors and nurses, the ICU represents an escape from the "chaos of the wards" (SpR in ICU). This is further supported by ICU nurses' emphases on *differences* from general ward nurses, rather than constructing a difference between medicine and nursing.

In turning to my own data, then, I want to ask what is the knowledge base of ICU nursing in practice? How, if at all, is a nursing perspective and emphasis on care manifested? In answering these questions, I argue first that the knowledge which nurses use, even in communication with other nurses, is mainly biomedical in character. But I further argue that this by no means precludes a concern with 'psychosocial' – especially social – aspects of care.



## Intra-nursing communication

I will present data on two types of intra-nursing communication, one written (the nursing evaluation plan) and one verbal (the nursing hand-over) to clarify the salient aspects of ICU nursing knowledge as it is used in practice.

Urban ICU had adopted the 'nursing process': 'Assess, Plan, Evaluate' (Urban, visit 16), and an "ICU Evaluation Plan" was completed by nurses at the end of each shift for the benefit of the incoming nurse. I was informed that in general the nurse writes a short paragraph on each of the following subheadings: Sedation; Infusions; Ventilation; Cardiovascular status; Renal and Gastrointestinal and areas of skin pressure. I was also told that a Neurological assessment was written "if appropriate", and observed on a different occasion a nurse writing comments on the patient's "comfort and hygiene". I was told that the end of shift evaluation in intensive care is particularly important, as "all systems can be affected". In addition to these end of shift reports, the nurses also routinely (every hour or two hours) complete three charts for monitoring patients' fluid balance, their cardiovascular system, and their respiratory condition<sup>4</sup>.

Thus the nursing plan (for each shift) is to work through each body system. It can be seen that the categories follow a 'biomedical', systemic definition of the body. The nurse who told me about this 'Evaluation Plan' did not mention a routine consideration of the 'psychosocial' patient. In fact, this nurse represented an interesting case, as she *did* value the 'psychosocial' side of nursing, and was about to take up a new post as a palliative care nurse, citing a desire to "let people die naturally" (Urban, visit 15). So, at one level, we could note that this nurse felt that ICU was over-medicalised, or at least seemed to emphasise interventions beyond the humane. On another occasion I noticed that an Evaluation Plan contained the comments: "Maintain patient's privacy and dignity. Keep relatives informed." (Urban, visit 6). While this is indeed indicative of a nursing concern with 'care' we could note that such a comment is only a small part of the totality of nursing work for a shift in ICU.

The centrality of a 'biomedical' viewpoint on nursing work was even more apparent

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<sup>4</sup> Unlike medical records, nursing records seem to have received little sociological attention (an exception being Purkis' (1999) exploration of "writing nursing"). The many written recordings, notes and charts in ICU would make it an apposite locale for investigating the representation of different kinds of nursing knowledge (see also below, page 198 and page 226).



during the nursing hand-overs. At the start of each shift, the Senior Nurse described the patients currently on the ICU to the incoming nurses. The information they presented was overwhelmingly biomedical, for example, the patient's heart rate, respiratory rate, blood counts and level of oxygenation; occasionally relatives' needs were mentioned. Before presenting near-complete data from one hand-over, I should note that I encountered two problems in recording the detail of the hand-overs. The first was the speed with which they were undertaken. Several Senior Nurses 'competed' for who could do the quickest hand-over, especially when the patients were all stable:

'you should see me at the end of a night shift - I just rattle straight through it and if they're not listening they'll miss it - tough'. (Sister, Urban, visit 5).

The second problem (indicative of the biomedical character of the information relayed) was that the nursing hand-overs were rather too 'technical' and jargon-ridden for me to understand (to begin with) and then transcribe with ease (later). However, on one occasion I did manage to record most of the information because the Sister deliberately adopted a steady pace, as there were several new nurses.

The Sister started off by mentioning several general pieces of information (the 'chute' was out of action; it was several nurses' first day on the unit; one nurse will be half-an-hour late; three nurses are working 'long days'). She was then explicit about going "clockwise round" the ICU (for the new nurses' benefit): firstly one of the Side Rooms, followed by the six beds on the open ward, finally the second Side Room. I present this data in full as it provides a key resource for understanding the kinds of knowledge which are regarded as important to ICU nursing:

F (Sister): '[Side room: name of patient]. Pneumonia, roaring pneumonia. Tracheostomy. Puss plus plus plus out of the trachy. Tidal volumes OK. Respiratory pressure... bronch washings. Temperature 39.9 In AF<sup>5</sup>. Urine output OK. Just sedated. Family aware - seemed to be doing a bit better recently, but worse overnight.' 'Bed 1, [attempted suicide] Alcohol, paracetamol, not sure why. Not sure if aspirated. Extubated today. Still said he wanted to be dead - had a little cry earlier. Arrhythmias, respiratory rate 20, 60% oxygen. Seen by CPNs<sup>6</sup>, they've looked at notes. Looking for a medical bed for him but found HDU transfer quicker.' 'Bed 2 - long time, 27 days, from [another hospital]. Straight graft. Dialysis. Jaundice. NG/NJ<sup>7</sup> feed. Dialysed every other day. Was mostly every day. Changed tracky tube. Couldn't get a nine in, had to put an eight<sup>8</sup>. Still not responsive. No eye contact. Muscle wastage. Not resting, not sleeping. Tried to bite [a nurse] the other night, I think he's just hungry. Clammy episodes - could be his heart. Pyrexial<sup>9</sup>... Green

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<sup>5</sup> AF: atrial fibrillation. An irregular heart beat caused by problems with the atrial heart muscles.

<sup>6</sup> CPN: community psychiatric nurses.

<sup>7</sup> NG feed: nasogastric feed: liquid feeds through the nose into the stomach. NJ feed: as nasogastric feed, but the tube passes through the stomach and the duodenum into the jejunum.

<sup>8</sup> 'Eight' and 'nine' refer to the size (diameter) of the tracheostomy ('tracky') tube.

<sup>9</sup> Pyrexial: has a fever.



sputum. Very slow, if anything, can't even call it an improvement.'

'Bed 3 - 58... Was on [ward]. Sudden onset. 56... Liver not working, he had been taking paracetamol for chronic pain... Liver function has plateaued. Jaundice a bit better. Get oriented, very very restless. Daughter's here. Not that awake. CPAP<sup>10</sup>... not fully awake.... TPN<sup>11</sup>. Sliding scale insulin. Trial extubation. Propanol. Daughter and son. [She's a] support worker on one of the wards.' (Another nurse states the name of the ward).

F (Sister) continues with the name of patient bed 4: 'HDU as soon as can get a bed. Extubated - high flow since end of the week. 35% oxygen. Bipap if she needs to. Apyrexial. She's got hearing aids but no battery' (general laughter).

'Bed 5 - went off respiratory wise. Came here Thursday or Friday, gradually weaned over the weekend. Trialling extubation....' (Another nurse says "I don't think she'll do"). F: 'No cough, nobody thinks she'll manage. Nora<sup>12</sup>, urine output always excessive. Daughters are very anxious, so if she's anything like them, she's anxious.

[Bed 6:] '[Another hospital] had him for ages, must be three weeks, is sedated at the moment.' Staff Nurse: "Oh, bless him". F: 'Propofol... abdomen, diarrhoea. Family just want to speak to someone. Not going to do. Awake one day. Down the next.'

[Next Bed, Side Room]. 'Allergic to one of the things she took for an overdose. Size 7 tube. Piriton.' Staff Nurse: "Is she diabetic?" 'No. Insulin sliding scale. Family shocked [at suicide attempt] - as surprised as anyone.'... (Urban, visit 12)

The Sister then finished off the hand-over by mentioning which of the nurses were on 'long days', and which patients they were looking after. She then left just after about twenty minutes, saying "you can do your individual handovers now", so this hand-over lasted for about twenty minutes, for eight patients. The form of handover seems to be fairly constant across different ICUs: it was similar at three ICUs I visited and another study confirmed that the hand-over usually proceeds as a monologue (Strange 1996). I was reassured by Strange's report, as initially I felt that the monologue was stilted, and wondered if my presence had made the other individuals in the room unwilling to make comments. Strange also confirmed that handovers are not long; the language of the report is a mixture of formal and informal jargon; and that "most commonly the problems are dealt with system by system" (Strange 1996: 110).

The kinds of information that are mentioned at hand-over are therefore (in the order they can be seen in the extract above): diagnosis; treatments and interventions; bodily functions and measurements thereof; physiological values and trends; family, relatives and personal psychological state; organisational matters; general patient background; prognosis. This information can be seen to be a mixture of technical, biomedical details, including the patient's diagnosis but particularly focussed on current physiological values and their trends. In addition, procedures and activity around the

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<sup>10</sup> CPAP: continuous positive airway pressure. A form of mechanically assisted breathing.

<sup>11</sup> TPN: total parenteral nutrition. Food is passed directly into the bloodstream.

<sup>12</sup> Nora: noradrenaline, an inotrope (stimulates heart beat) and vasopressor (raises blood pressure). Naturally occurring, but a synthetic form is given in ICU.



patient are noted. Intermingled with this is 'psychosocial' information, regarding background to the patient's admission to intensive care (particularly in this extract where two of the patients had attempted suicide) and information on the patient's relatives. It is possible that there was more discussion of 'psychosocial issues' than was routinely the case because two of the patients had attempted suicide.

Most hand-overs were much more brief and "business like". At Metropolitan, around twenty patients were described and nurses allocated to them within fifteen minutes. As far as the Senior Nurses are concerned, several tasks have to be accomplished at once: providing enough information for the nurses to know the likely problems of the patients; matching experience of nurses to patients; and instantly evaluating the skill level of agency staff. In spite of their brevity and task-oriented nature, hand-overs are a good guide to the kinds of knowledge which nurses use, since it is *intra-nursing* communication, is what nurses need to know and indicates the points of their common perspective. It might even be said that the data presented above are a better guide to "epistemology" than that obtained from in-depth interviews, because the latter could be affected by presentational and normative aspects, rather than data captured *in situ*.

Overall then, nursing in the ICU adopts a biomedical viewpoint, mixed with concern for the patient's family. The concern for family members is expressed in explaining to relatives about the ICU, about the medical technology, in small talk, and in listening.

For example:

[Side Room]. Staff Nurse M talks to the patient [about what he is doing] who seems unconscious, and is chatting to the patient's husband; small talk e.g. 'it's cold out', 'did you find somewhere to park?' He tells the patient's husband that she is "on the mend", taking in food to build her up. M prepares the drip for food, then cleans equipment. Chats about their relatives: sons, grandchildren etc. He says "tiring you out as well... quite a bit of urine today" (Went into some detail)... The husband is visibly upset, crying quietly... [few minutes later] M says "Is there anything else you need to know? When was the last time you spoke to a doctor?"... When the husband has left M tells me he finds it quite difficult when relatives are just sat there. (Urban, visit 18)

Despite this nurse's protestation that he found it 'difficult' to deal with family members, it seemed to me to be an accomplished and sensitive undertaking. As well as checking with relatives that they have "seen a doctor", nurses can prompt doctors to speak to patients' relatives. This can result in a joint approach to detailed discussion with patient's relatives:

Nurse H wants to know where L (Consultant) is. He is quite worried about his patient (a 46 year old whom they think is going to die): H wants to know the "resus status". The noradrenalin is at 120 which is the maximum and it doesn't seem to be making



much difference. There's also a tricky issue with the relatives (the patient's immediate family and his partner do not get on)... Someone on the phone to HDU establishes that L is there. H arranges for another nurse "to keep an eye" on his patient while he goes to HDU to explain to L... L returns, there's a phone call with the partner, L takes it: "He's very much worse than he was yesterday..." Ten minutes later L and H go off together to speak to the relatives, lasts 10-15 minutes. (Urban, visit 5).

So through their work nurses become aware of particular issues with patients and their relatives, but this does not seem to be a 'unique perspective'. Indeed, for further action to be taken they must convince someone with greater authority about the particular need. This person with greater authority can be the Consultant (as in the example above) or the Senior Nurse. For example, one of the Senior Nurses told me about a decision to give some relatives the opportunity to speak to a clinical psychologist. I asked her whose idea it was:

That was just fed to me by the nurse at the bed side... Just the father and the mother - you know - expressing quite a lot of guilt - a mixture of guilt and anger and failing to cope just at that point. Where they felt they couldn't tolerate much more, and we are fortunate in that we do have a clinical psychologist that is available to the unit... I suggested that might be an option to use. They alerted to me the fact that they were carrying quite a lot of anger and guilt and the nurse on the shift thought that they couldn't cope so we just discussed ideas and said that maybe we should let them know that we do have this availability here. (Interview, Senior Nurse, Metropolitan)

In this instance, then, the nurse did not consult a doctor, and the social aspect of caring, caring for the relatives, was dealt with entirely within the nursing profession. Meeting relatives' needs was clearly a priority for Staff Nurses, as further demonstrated by the way that they could interrupt meetings between doctors on behalf of patients' relatives:

At Bed 2, K (Staff Nurse) is explaining something to relatives, but they had not really understood - they came up to the Nurses' Workstation asking to speak to a doctor... K reappeared, took them back to the bedside to try again. They still weren't satisfied... [Later:] On the way to her break, K pops in to the Seminar Room where Consultant Z was with P (SHO)... K: "You won't forget 'my relatives' will you?" Z says "No", and a minute or so later he says to P: "Who wants to talk to Bed 2's relatives?" P agrees to, and they discuss the 'plan'. (Urban, visit 24).

This data extract indicates how work with relatives is regarded, in the first instance, as nursing work. The phrase 'my relatives' (often abbreviated to 'my rellies') was commonly used by nurses, further demonstrating their ownership of this aspect of work in the ICU.

ICU nurses' self image is that they are self-selected as those nurses who like "the technical side". But in the ICU, as a consequence of the large numbers of staff, they also have time for 'social' caring. While care for the patient is rendered difficult by patients' lack of consciousness (and even if they are conscious, they are inhibited by



tracheostomy, and tiredness can prevent written communication), the nurses have ample opportunity to care for patients' relatives. Although the acute care, invasive monitoring and a culture emphasising control might be medically defined, it releases nurses to have time with patients' relatives, to answer their questions in detail on the phone, to explain medical terminology and the purposes of equipment and technology to them and to remind doctors to speak to them. These tasks were a common and routine part of nursing work in ICU.

So far then, we have seen that ICU nurses are concerned with technical, biomedical details and social aspects of care. These social aspects do not constitute a unique perspective, as often doctors need to become involved, but they are part of nurses' routine work and are a nursing responsibility in the first instance. In the light of the foregoing data extracts, where medical input was sometimes deemed necessary and sometimes unnecessary, I now discuss in more detail points of possible dissonance between nursing and medicine in ICU.

### **Points of dissonance and conflict between nurses and doctors**

I have so far hinted at a general commonality between medicine and nursing in the ICU. In order to examine whether doctors and nurses share basically the same perspective, I examined my data for points of conflict and dispute between doctors and nurses, which may have provided an insight into the supposed differing world views. The traditional formulation would be that doctors are quantitative, positivistic and "scientific" (in the substantive sense that they concentrate on biomedical data, not that they are *scientists*, as I discussed in chapter six). The following quotations from doctors in Zussman's study would seem to support this:

'In the unit... it's a little bit of a science project... That's basically what people are reduced to. It's blood pressure, temperature, respirations, and their cardiogram.'

'Good doctors never look at the history of the patient. They just look at the numbers.'

'This is the patient' [one physician said]... perhaps only half joking as he held up the flow sheet that listed the woman's laboratory values.

(Zussman, 1992: 32-3).

Harvey regarded the medical viewpoint in a similar way, although was less sympathetic, and contrasted it with nurses' viewpoints:



Typically nurse responses would emphasise the patient as 'subject', for example: 'When somebody is allowed to die with dignity, in that treatment isn't carried on when really it's pretty obvious that this patient is trying to die.' (Staff Nurse, Specialised Unit). For doctors, it revolved around 'when all therapeutic interventions have been exhausted and the patient's death becomes unavoidable'; thus the patient as 'object' is to the fore. (Harvey 1997: 733)

However, I think that both Harvey and Zussman are guilty of treating these reports as literal representations of what doctors and nurses say and do.

There are a few examples from my own data which might lend some support to such an interpretation. For example, one Saturday morning, the Consultant was leading a ward round with an SpR, an SHO and myself in attendance. Partly because it was the weekend, the atmosphere was fairly relaxed:

Saturday morning, 9:45am, Consultant B is leading the ward round with F (SpR) and H (SHO). After F has examined the patient's abdomen, B regales us with several anecdotes about his life as a junior doctor (e.g. 'fearsome professor of paediatrics'), lasts five minutes. Then H says "he's peeing". B: "Right, back to the patient" (turns to the computer monitor), '[Let's] look at the drugs, on the chart'. (Metropolitan, visit 9)

At the time I felt the "back to the patient" comment, while turning to look at the computer monitor, was a "classic moment". Here, apparently, is a fine example of a doctor 'objectifying' patients, just as would be expected from the literature.

From the literature we would also expect nurses' views of patients to contrast with doctors', such as I witnessed on another occasion when I was with a Senior Nurse:

(3:30pm) E (Sister): 'Let's get a move on.' We go into a Side Room. She notices the computer screen (at the end of the bed) is raised, and lowers it. E: 'This is one of my bugbears. When we had charts, people used to turn away from the patients to look at them. Now, with the computer screen, people raise it up to eye height, so it is still obscuring the patient.' (Metropolitan, visit 12)

So, at a superficial level, the nurse is concerned with a relational view of the patient whereas the doctor is concerned with facts and figures.

However, this equation of medicine with the patient as 'object' and nursing with the patient as 'relational subject' is, on reflection, rather simplistic, and there were counter-examples. With regard to doctors 'objectifying' patients, there were aspects of Consultant B's (as above) practice which could be viewed as "holistic". He insisted on patients exercising as they start to recover, recommended television or music for stimulation, and advocated "wine and good food" as important to recovery:



B says he likes to get patients active... [One] patient had some wine at lunchtime, partly sedative, but also “reintroducing to ‘life’, getting his taste buds going” etc... He says he’s keen on motivating and encouraging patients, as in intensive care you can ‘let nurses do everything for you’. Good to exercise, eating hospital food is no good – get relatives to bring in ‘good food’ from home. (Metropolitan, visit 7)

On another occasion, the same Consultant also questioned the treatment regime a patient was receiving, in terms indicative of the patient as subject:

To the next bed, the patient has been in ICU for a month; is severely injured (paraplegic). Nurse says he is not sleeping. B (Consultant): “We need to ask him what he wants. Has anyone actually asked him? We’re being paternalistic giving him all this treatment.” (Metropolitan, visit 4)

In fact, on occasion I heard doctors use technical biomedical information in quite bizarre ways, construing the patient simultaneously as subject and as object:

[End of ward round] Consultant B summed the ‘day’s action plan’: “OK. Ascertain not going anywhere with bed 6, ask [side room] if he really wants to be acidotic.” (Urban, visit 18).

‘Acidotic’ is where the blood has high levels of carbon dioxide, but I do not think most conscious people, let alone a sedated ICU patient, would really know whether or not they should be ‘acidotic’. Yet somehow the Consultant suggests ‘asking’ the patient (although refers to him by identifying the bed he is in).

With regard to nurses supposedly emphasising the purely relational aspects of ICU nursing, Sister E, mentioned above, told me how she was keen to educate her staff on the details of treatment modalities. For example, she wanted them to learn about different reasons why a patient might be on mechanical ventilation:

The other thing that I was keen to see [written on the problem sheet] was a reason for [the problem]. So instead of just writing ‘ventilator dependent’ we actually acknowledge the reason why: ‘Secondary to Adult Respiratory Distress Syndrome’ or ‘Secondary to Chronic Obstructive Pulmonary Disease’. Two completely different disease states that are making that person ventilator dependent and by using it that way you can make people just stop and think, particularly in terms of novices to critical care, I see it as teaching them. Just write ‘ventilator dependent’, it doesn’t mean anything. I mean they can be on that ventilator for a variety of reasons. (Interview, Sister, Metropolitan)

So, the Senior Nurse is keen that ‘novices to critical care’ develop an understanding of the different ‘disease states’ underlying the treatment a patient is receiving. This is something which might be traditionally construed as being in the medical domain.

The Senior Nurse’s comments were made in the context of discussing a new system of keeping records which that ICU had recently introduced. Rather than having separate



nursing and medical notes, the new system took the form of ‘patient problem sheets’, which were joint medical and nursing notes. This is even more indicative of the similarity, overlap and congruity between nursing and medical perspectives in the ICU. It should be noted that there were some issues with the system as it was being set up, and the process was not functioning ideally. One Consultant in particular was accused of refusing to deal with what he called ‘nursing problems’. Sister E implied that this Consultant would not deal with chronic problems, regarding only acute problems as issues for him to deal with, but she commented that “they’re not medical or nursing problems, they’re the *patient’s* problems”. I am not arguing here that there were no tensions or difficulties, but that as these are seen as issues to be resolved, and in principle resolvable, it is implied that there is a common perspective, despite the different education, training and experience of doctors and nurses. Furthermore, the issue about the ‘kinds of problems’ to be dealt with in ICU was sometimes expressed to me by nurses along similar lines to the ‘problem’ Consultant above: “we weren’t busy last night, these patients are long term weaning problems really” (Senior Nurse, Urban, visit 20). Similar comments were made to me throughout one week of fieldwork where patients could not be transferred out of ICU as the rest of the hospital beds were fully occupied – *all* ICU staff were bored with the non-acute problems with which they were dealing that week.

Another possible “difference of opinion” was the attitude towards ‘hygiene’. Doctors, on the whole, implied that hygiene was not important, whereas nurses emphasised it. But to clarify, doctors as well as nurses warned me about the importance of washing my hands after we had seen each patient as I accompanied them on a ward round. But doctors had a marginally more casual attitude towards the wearing of aprons. They would follow a nurse’s request to wear an apron, but say something like the Consultant on my first foray into ICU:

“washing hands is to protect the patient, wearing the apron is to protect your clothes... there’s no evidence that wearing an apron makes any difference, but we do it to keep the nurses happy.” (Consultant, County, visit 1).

Such a comment demonstrates that Roth’s (1957) findings, that the position of a member staff in a hierarchy, ritual and tradition influence the adoption of hygiene measures, are remarkably stable. Doctors now seem to invoke ‘evidence’ to justify their slightly more casual approach than that of nurses.

The overall emphasis so far on congruence rather than difference might be considered



rather flimsy. Am I in fact painting a rather rosy view of nurse-doctor interaction? Did I not witness *any* disputes or differences, and how might they be interpreted? Well, I did witness only a few. But one big disagreement between a Senior Nurse and a Consultant bears detailed scrutiny.

The argument centred on a somewhat incongruous 'not for resuscitation' request. The agreement with the relatives had been that treatment would continue at the same level, but if the patient had a heart attack the ICU team would not attempt resuscitation as the patient was not expected to recover. Apparently some of the patient's relatives were still 'holding out hope', although none of the ICU staff thought recovery was possible. However, some time after the agreement to continue treatment at the same level had been reached, one of the Consultants altered treatment for a short while, when the nurse for that patient was on a break. The issue was subsequently taken up at a review meeting (open to all members of staff, generally attended by most doctors but only a few nurses) by the Senior Nurse for the shift concerned. Because the discussion became heated I felt awkward about taking notes at the time: the following record is a combination of notes made a few hours later and notes made just prior to the meeting becoming disputatious. I have anonymised this meeting more than usual, in an attempt to further protect the identities of those concerned. The key actors are Consultant F and Senior Nurse C.

[The original event as I observed it]: H (nurse) seems a bit stressed coming back from a break, as the family all gone home and 'they didn't think anything was going to happen'. The patient's heart rate is very erratic. Consultant F (who had been at this patient's bedside) goes to another bed...

The next day, a meeting to review all patients was attended by several ICU Consultants and junior doctors and a few nurses of different grades. Consultant G was chairperson.

G: "[Patient has lost a lot] of blood, slowly deteriorated, dialysed, decision taken..."

E (SHO): "half the family wanted to alter treatment, and the other half didn't."

D (SpR): "Lot of noradrenalin and potassium rising... Some discussion with family, decided this morning no further electricity - they didn't want the electric heart start anymore."

B (Consultant) joked: "no electricity - battery power only".

F (Consultant): "Last night [we agreed] absolutely not to discontinue".

At this point C (Senior Nurse) interrupted, and it became a fairly heated exchange between C and F. C had been the Senior Nurse the day before. Consultant F had altered the noradrenaline, and the heart rate had fallen [dramatically].

C: "why did you stop the noradrenaline then?"

F: [I was undertaking] a "therapeutic experiment."

C: 'you say you've done a therapeutic experiment...' (the term 'experiment' seemed particularly galling)

F: "Doctors alter treatment all the time."

C: "I can't see how it's not going to stop his heart when the noradrenaline is reduced [by that amount]".



C said that the Staff Nurse had been upset, the family had said they didn't want treatment altered; the nurse on duty had not wanted to fill in an 'incident' form, but that C was thinking of it.

F said it was only five minutes and he was at the bedside, the nurse was on a break.

C said F hadn't asked for that nurse, nor, in fact, any nurse at all.

Consultant B tried to pacify the dispute: "It's about communication, isn't it, really?"

F resisted that move: "No, I don't think it is."

At this point another Consultant recommended an incident form...

F: "that's not for you to decide, that's C's decision"...

G: "So, for [later discussion]<sup>13</sup> then."...

(Reference omitted)

It seems that there is a clash of perspectives here. For the nurse, the relatives had not agreed any alteration of treatment, so you could say that the nurse is acting as 'patient's (or relative's) advocate'. Even more galling to the Senior Nurse (as confirmed to me later) was the term 'experiment'. But for the Consultant, his right to alter treatment, and to conduct a 'therapeutic experiment' (connotations of science and objectivity) was part of his clinical autonomy. However, I want to resist the tempting conclusion that this is all due to radically different perspectives of doctors and nurses; further (interview-based) data from some of the people involved show how this is not the case.

In broad terms, while there was a very visible dispute between an ICU Consultant and a Senior Nurse, the medical staff ended up here supporting the nurse. The nurse was indeed "riled" by the term 'experiment', but it is worth noting the comment given as to why:

"Therapeutic experiment", I think is just ethically unsound... it sounded like he did it just to find out what would happen. Doctors do, I don't want to call it experiment [SC: 'trial?'], trials, as he said, but not when someone's dying, it's not on.

(Interview, Senior Nurse)

So the nurse acknowledged the doctor's right to alter treatment. The issue is that normally doctors alter treatment in an attempt to make a patient better: if a patient is dying it cannot be therapeutic, there is no valid purpose in doing so and it is unethical.

One of the Consultants at the meeting also later expressed his incredulity:

Then he said 'I was trying an experiment' and I thought 'What do you mean, an experiment?' [laughs]... we raised our eyebrows... (Interview, Consultant)

Admittedly not quite as forceful as 'ethically unsound', but still surprise, if not shock. What these two informants thought, at least after the fact, to be the main problem was

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<sup>13</sup> The later discussion would be a Consultants-only meeting, which under the circumstances I felt unable to ask to attend. But the view of at least one nurse was that there was a "heated discussion" there.



the ‘communication problem’, as mentioned by Consultant B at the meeting (which I admired at the time as a political move, not thinking it was actually *true*). Thus, the Senior Nurse later said to me:

We didn’t know why [the noradrenaline] had been stopped. The patient was going to die anyway. And it was all done without consulting the nurse... it was unfair, putting nurses in that position... [the nurse] was aware of the opinions of the relatives... [Consultant B] mentioned that it was a communication problem and I think that that’s what it was, really. (Interview, Senior Nurse)

And a Consultant commented:

It’s an odd thing to do. What you normally do, if you’re going to do something that’s a bit odd, is have a natter to the nurse and say ‘this is what I’m going to do’, explain it... (Interview, Consultant)

Overall, despite the connotations of the term ‘therapeutic experiment’, this is better explained as an unusual incident than a difference between medicine and nursing viewpoints. In fact, a reasonable interpretation of the data is that there are clearly differences in medical opinion: at the very least, different views as to the necessity and ways of discussing and explaining medical decisions to nurses.

It seems to me, then, that although there are examples of ICU doctors and nurses which might be interpreted as them having fundamentally different perspectives, there are other, more plausible, interpretations of such data. Bearing in mind some of the findings of other studies, where it is alleged that there are differences of viewpoint, my argument is that the staff at the ICUs I visited work closely together and thereby come to share a common perspective. In the next section I demonstrate this more fully by exploring similarities between medical and nursing work in the ICU.

### **Similarities between medical and nursing work**

It is easier to point to similarities between the work of ICU doctors and nurses than identify differences. Some of these might appear trivial, so I do not dwell on them at length. But in the day-to-day practical work and skills, the local knowledge required, and the view of and learning about the human body, ICU nurses’ and doctors’ work is, if not quite unified, overwhelmingly similar.

In their day-to-day work, while the nurses would often deal with the machines and equipment, doctors also had to be able to do so should the need arise. For example,



when a group of nurses were attaching a balloon to a tube, I was told that one Consultant was the “expert” at this particular job; another Consultant could locate a particular piece of equipment when none of the nurses or health care assistants knew where it was kept. What might be thought of as ‘dirty work’ (E. Hughes 1958: 121ff), dealing with bodily excretions and the like, was rather sanitised in the ICU. On one occasion, when urine was accidentally spilled over the floor, a health care assistant was called upon to assist. I noticed, also, junior doctors clearing up after themselves (and to some extent, after Consultants) – doctors not clearing up after themselves notoriously irritates nurses. In short, there seemed to be little difference between (junior) doctors and nurses in whether certain kinds of work were ‘beneath’ them.

There was a similar ‘satisfaction’ expressed by doctors and nurses in two routine procedures. Nurses routinely ‘suction’ patients, that is, clear up saliva in the airways around the mouth. Doctors frequently performed a broncheostomy, that is, extracting excess liquid from the lungs (they called this “hoovering”). Of course, the two procedures can be characterised as different, for one is just inside the mouth, whereas the other is right inside the lung. But for both, doctors and nurses talked about how the job was satisfying and made the explicit comparison themselves. For example, when an SHO had just completed her first broncheostomy,

M (SHO) said that she thought it was a satisfying job – C (Staff Nurse) agreed, ‘it’s like when we do suctioning’ (Urban, visit 16).

How the human body is viewed by both sets of intensive care practitioners is generally similar. ICU doctors seem not to view the body ‘systemically’ (as is, I suppose, the case for medical and surgical specialists whose focus is some body organ, system, process or area). ICU ‘treats’ people with any of several organs in failure, and for this reason the medical view becomes more ‘holistic’: intensive care medicine becomes a kind of “whole body applied physiology”. ICU nursing staff learn, on the job, about the different body systems in greater depth, and how they interact. Two quotes indicate how they value the opportunity to learn about this aspect of intensive care:

Nurse M ‘It’s really interesting, you can change the whole metabolism by changing the breathing... interesting that it’s all interlinked’. (Urban, visit 18).

Nurse J: “Seems funny, saying breathing is interfering [with the process of getting better], but that’s what they say...” (they have sedated one patient, because his breathing wasn’t helping recovery). (Urban, visit 21)

How to treat the body’s fluid imbalance, as a further example, is crucial to intensive



care. One fundamental datum, needed by intensive care doctors and nurses, is the answer to the question “Is [the patient] peeing?”

L (Staff Nurse) says to P (SHO): “My patient’s not peeing” P: “Oh dear, [give some] frusemide<sup>14</sup>” L: “How much frusemide?” P provides the answer. H (Staff Nurse) says ‘my patient’s not peeing either’, but P is distracted by a patient pulling his breathing tube... A few moments later, P says “Are you serious about not peeing?” H: “Yes, I never joke about such things”... There is a phone call about a new admission, H takes it, and announces ‘theatre are saying he’s ready...’ [Into the phone] “is he peeing?”... He finishes the call, then says ‘Theatre are ready, they’re quite happy, just letting us know.’ (Urban, visit 24)

In the space of a few moments, then, the fluid balance of three patients is addressed and resolved, with close liaison between a doctor and nurses. On another occasion, a nurse had identified a patient on a general ward whom he thought was “virtually moribund”. He mentioned this to a Consultant who went to see the patient and a few minutes later returned to the ICU:

R (Consultant) returns from seeing a patient on the ward – they’d arranged for transfer to HDU... R told me ‘Urology had “drowned him” - had kept giving fluids, lots of fluid, but it was all accumulating, nothing was coming out, he wasn’t peeing’. R had prescribed frusemide, a diuretic. He commented that the doctors had ‘obviously just got stuck on one aspect of the patient’s situation, assuming no urine means needing fluid, rather than considering a slightly different tack’... (Urban, visit 25)

So for both ICU doctors and nurses, there is an awareness of fluid imbalance; while in the last example there was some concern for the ‘wider picture’, the root cause (diagnosis), a “medical viewpoint”, was not emphasised by the Consultant.

What can also be seen in the last example is the role of the nurse. A ‘Clinical Nurse Practitioner’, he was an ex-ICU nurse with responsibilities which used to be the role of junior hospital doctors: ensuring that patients who are getting sicker on the general wards receive appropriate levels of care. This is a relatively new phenomenon, advocated as a policy recommendation in *Comprehensive Critical Care* (DH 2000), and seems to me to indicate the common vision and alliance towards expanding the sphere of influence of ICU doctors and nurses. *Both* professional groups stand to gain more influence and power in the rest of the hospital as ‘critical care outreach teams’ and ‘levels of critical care’ are established. The development of these outreach teams (consisting of ICU trained nurses, with reference to ICU Consultants), reinforces the jointly held medical and nursing ICU view that ICU ‘rescues’ patients from substandard care on the wards (McQuillan *et al.* 1998). This was put forcefully by Consultants and experienced nurses:

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<sup>14</sup> Frusemide: a diuretic.



Consultant B: 'The NHS is a battlefield: the wards are getting de-skilled. Eventually it will become more and more like America, with hospitals having large ICUs, the rest of the hospital being like a hotel. (Metropolitan, visit 9).

G (Clinical Nurse Practitioner) and K (Sister) are talking at the work-station. G had three examples of patients deteriorating on wards in the rest of the hospital. He showed K some blood gas readings for one of them, she says "Give the man some potassium!... I don't know how some of these nurses sleep at night". (Urban, visit 25).

The Consultant and the nurses both emphasise the superior technical skills and knowledge of ICU nurses, compared with nurses on general wards. Some of this self-regard was tempered by an awareness that the large numbers of nurses and the nature of critical illness (with, for example, patients routinely sedated), means that nursing work in ICU can be easier than in other acute areas:

J (Charge Nurse) told me that compared with other wards, it is much more controlled. Nursing work is, in fact, much easier... "the nursing element is 100% rather than just 2%." (County, visit 3).

Apparently, though, the ICU nurse's work is "100% nursing" - all the extra busy-ness on other wards is, by implication, not 'true nursing'.

The learning needs of junior doctors and student nurses, for practical purposes, seemed similar, too. Both occupations need to know about applied acute physiology and its treatment. For example, knowledge about breathing for practical clinical purposes is represented in terms of Inhalation-Exhalation ratios. I witnessed two similar conversations, at least in their technical content: one between a Consultant and an SHO, the other between an experienced nurse and a student nurse. The issue was about mechanical ventilation, where there is a relationship between frequency, volume and the "I:E ratio" [Inhalation: Exhalation ratio]. Both the student nurse and the SHO were having difficulty in deciding whether to keep either the 'inhalation time' or the 'I:E ratio' constant.

P (SHO) and Z (consultant) are in the Seminar Room. P talked about how he found using the ventilator a little difficult at times. He had spoken to another Consultant about it, thought he'd got it, but then thought "shit, no I don't" in a particular situation... Z: "Easiest way to think about it" is to think of a rate of 10 or a rate of 6. Rate of 10 [implies] 6 seconds, rate of 6 [implies] 10 seconds. I-time constant of 6 or 10 seconds. Keep I-time constant if happy with tidal volume. (Urban, visit 24).

C [Staff Nurse] is trying to explain to a student nurse about breaths - inhalation/exhalation, 10 breaths per minute = 6 seconds; I:E ratio... Later the student nurse says to a few of us at the Nurses' Workstation as he is walking past "I'm struggling with the maths - only got GCSE grade 5." (Urban, visit 25)

Obviously not all medical and nursing learning needs are identical, but there are fundamental areas where proper understanding is seen as absolutely necessary for both



groups (and, indeed, difficult to ‘get’ whether your mathematical knowledge is consonant with GCSE grade 5 or a degree in medicine).

The action-orientation of both occupations is likewise similar and the “epistemologies of practice” (Schon, 1988[1983]) have a great deal of overlap. Nurses implement protocols and would like more of them: for example, one nurse complained that different Consultants would prescribe different sedatives: “It would be nice if we could have a protocol to follow”. Anaesthesia, the medical specialty with the closest association with ICU, is described as “algorithm-led”. While ‘medicine’ (i.e. what physicians practice) is described as “diagnostic led”, we have already seen in chapter five how one ICU Physician disparaged the medical fixation with diagnosis: the diagnosis is to inform the ‘treatment plan’. Doctors as well as nurses have protocols (notably for novel treatments). In practice, it seems to me that the similarities between protocols, guidelines and algorithms outweigh the differences.

Doctors claimed that they can override those protocols which are implemented, depending on the individual case. But nurses, too, made a similar claim, although slightly more bounded:

K (Senior Nurse) explains to me about “sats” (density of red blood cells)... ‘You can only get CO<sub>2</sub> from blood samples, which is why bloods are taken quite often... heart - keep at certain level, patients have naturally very different heart rates... There’s no point in just “textbook” values, you need to set the alarms differently for different patients.’ (Urban, visit 6)

No doubt the nurse, in practice, has less interpretive freedom than the doctor, but it remains the case that there is a marked similarity expressed in attitudes towards data, ‘textbook values’ and treatment, which further indicates the similarity between medical and nursing perspectives in the ICU.

The similarity in perspectives is reinforced by a degree of overlap in the clinical tasks that junior doctors and Staff Nurses routinely undertake. They could make informal arrangements to cover one another’s work. For example, the nurses on the night shift sometimes took blood samples between 6 and 7am, which would otherwise be the ‘on-call’ SHO’s last job of his or her shift. This was not a formal agreement, and varied according to the nurses and doctors on duty, which may be explained at least in part by the following comments from a Staff Nurse:

K (Staff Nurse) said that [nurses] feel that the doctors [on the ICU], generally speaking,



take their opinion seriously; with the junior doctors especially, you get two reactions when they first come on. Either ‘I’m the doctor, my opinion is this, just do it’, or ‘I’ve never worked in intensive care, you’re the nurse, what do you think?’ (Urban, visit 25).

I found it a widespread view (expressed by all grades of doctor and all grades of nurses) that nurses had expertise which new junior doctors ignore at their peril (this is part of the folklore of medical training). The advantage for junior doctors is that they can learn from nurses the signs of physiological problems (signs which, in turn, nurses have learnt experientially and on-the-job). As part of an exchange of favours, nurses can also then utilise doctors: for example, one nurse asked the junior doctor on duty to telephone pharmacy for her regarding a special feed for her patient as “they’ll ask questions I won’t understand” (Staff Nurse, Urban).

As a final point, although caring for patient’s relatives could be seen (rightly) as an area of nursing responsibility in the first instance, it was not a *uniquely* nursing task. For one thing, when there was a serious or difficult issue, the nurse at the bedside took it up with the Consultant or Senior Nurse, or just reminded a doctor. For particularly serious issues the doctor and nurse tended to speak to relatives together. So it is not a uniquely nursing attitude: doctors, too, talked about this aspect of their work:

SC: What’s attractive about intensive care?

D (SHO): The complex physiology obviously. But also the family dynamics and ethical issues... I like talking to people when they’re going through difficult times. Pressing the right buttons [on machines], whether as a doctor or a nurse, is not very difficult, once you’ve done it a few times. Communicating well – that’s being a good doctor. It’s more important, or at least, harder to do. Obviously, you need to be able to treat patients [i.e. medically] as well. (Interview, SHO, Metropolitan)

One Consultant, who was described to me in a casual conversation as someone who “winds up nurses”, was defended by a nurse: “I’ve seen him being really good with relatives”.

## Summary

Drawing together chapters six and seven, the comparison between medicine and nursing in ICU can be best summarised in Table 7.1, where key differences have been italicised. The main differences between doctors and nurses are in the respective roles of biomedical data and care of patients’ relatives. There is more emphasis by doctors on immediate interpretation of clinical data: for the nurse, parameters are set by doctors



and they must either keep values between certain limits or inform doctors if limits are exceeded. Conversely, nurses take prime responsibility for the care of patient's relatives, which includes keeping them informed of any developments. Doctors do get involved in this activity, but this is nearly always at the instigation of nurses.

	Medicine, doctors	Nursing, nurses
Diagnosis	<i>Can help to formulate a plan for treatment</i>	<i>Helps to understand a plan for treatment</i>
Biomedical data	Interpreted ( <i>immediately</i> )	Interpreted ( <i>within limits</i> )
Care of patients' relatives	<i>Contingent</i> (when informed by nurses)	<i>Routinely</i> managed
Technological skills	Necessary	Necessary

Nurses *do* have a slightly different perspective from doctors, but my argument has been that this does not appear to be fundamental and is therefore unlikely to be related to a difference in ideology or epistemology. In fact, what is more striking is the similarity between nursing and medical perspectives in the ICU. This finding, although in one sense opposite to Anspach's (1987), is entirely consonant with it. What has happened in recent years, at least in British intensive care, is that doctors and nurses have worked increasingly closely together. Away from the 'chaos of the wards', they have developed an allegiance to ICU. The doctors like this because whenever they ask for something to be done (a blood gas reading, for example) they know that it will be done soon, and they get to rely on a well-defined group of nurses. The nurses like it because, similarly, they work with the same few Consultants, can often get the attention of a doctor, and become respected for not only their technical skills but also their clinical knowledge. In the next chapter I take these ideas forward in an analysis of the organisational aspects of ICU work.



## Chapter Eight

### Controlling the Organisation

In the preceding chapters I have analysed clinical knowledge in practice, the character of clinical work, and medical and nursing perspectives in ICU. The purpose of this chapter is to explicitly link these earlier analyses to ‘organisation’. I focus on organisational aspects of ICU in two ways. First, mainly in terms of *internal* organisation, I analyse the working relationships between Consultants and Staff Nurses, including how the work of the ICU itself is represented in particular ways. Second, mainly related to *external* organisation, I demonstrate how the ICU is an organisational sub-unit of the hospital, and that there are on-going relationships between the ICU and the rest of the hospital which must be managed. For both these aspects of organisation I present participant comments as well as observational data, focussing in particular on how ICU Consultants, the formal leaders of ICU, talk about its work, organisation and relationships with the rest of the hospital. What is evident from participants’ comments are mechanisms whereby Consultants retain their control over decision-making, forge a loyalty to the ICU as an organisational sub-unit and retain their autonomy.

This analysis develops the concluding points of the last chapter, that nurses and doctors share an overwhelmingly similar perspective and possibly work more closely together than in other clinical settings. My substantive points about the internal organisation of ICU, its embeddedness in the hospital and Consultants’ talk about ICU work and organisational relationships are illustrated mainly by two sets of interactions: that between Consultants and Staff Nurses and that between Senior Nurses and junior doctors. While the second set of interactions in particular supports Allen’s (1997: 511) concept of ‘*de facto* boundary blurring’ between doctors and nurses, that is not the focus of the argument I present here. Rather, I treat the *inter-professional* boundary blurring which occurs as indicative of both Consultants’ ultimate control and the symbolic enhancement of an *organisational* boundary. Thus, although for nurses and junior



doctors in the ICU there are areas of informal negotiations about routine clinical tasks, and particularly close co-ordination over administrative and articulation activities, this work is undertaken with close reference to Consultants, who tend to maintain a hands-on orientation to administrative as well as clinical tasks in the ICU. In sum, the analysis identifies some of the mechanisms whereby ICU Consultants retain their clinical autonomy and their organisational authority – that is, their authority with regard to other health care groups, both within and outside the ICU.

### **Incorporating ICU nurses**

The most noticeable feature of general working relationships in ICU was their informality. The particular inter-professional relationship of Consultants and Staff Nurses was no exception, and was additionally characterised by evidence of mutual respect. Underlying these features was the routine Consultant presence on ICU: on all the ICUs I visited there was a medical Consultant present on the unit for most of the working day and well into the evening.

The habitual Consultant presence meant that other staff's work was defined by them to quite a high degree, and close working relationships develop. One example of this was the setting up of an ICU "follow-up" clinic for ex-ICU patients (this was at Urban ICU). One of the nurses talked very enthusiastically about working closely with one of the Consultants on this clinic. In all acute care Consultants have formal clinical authority, but my observations indicate that in ICU this formal authority is enacted in ways that are not always visible in other settings. For example, Reeves and Lewin (2003) reported that interprofessional interactions on general medical wards were fragmented and transitory in nature due to the number of different medical teams visiting the ward. In the ICU, there is one medical team and interprofessional interactions occur not only in ward rounds (where senior nurses *are* able to accompany medical teams) but are sustained over long periods of time and on joint projects, such as the 'ICU follow-up clinic'.

Working relationships were generally informal and collegial, although there were noticeable differences in medical consultant 'styles'. Some consultants were particularly formal, known only as "*Doctor Smith*" – but when Doctor Jones became



annoyed during a telephone referral, a nurse smiled openly, as if it was fairly entertaining and he was right to get angry. So the formality of the relationship could, on occasion, be modified. Most Consultants were on first name terms with all staff and some ‘mucked in’ with many aspects of work on the ICU, including routine nursing work:

Charge Nurse C returned from his break, needed help with lifting a heavy patient... he asked three nurses, who were at the workstation, to help. “I need to roll him, change his sheet, put his cream on”... He saw Consultant L at the workstation and said “Come on L!” L went behind the curtain to assist the four nurses. (Urban, visit 22).

More than on other wards, therefore, ICU nurses get to know the Consultants in informal and non-superficial ways. I was told that Consultants may challenge the ICU nursing staff to expand their clinical role:

B (Staff Nurse) said that soon after he had started on the ICU, he had approached a Consultant and said something about his patient going in a certain direction: “I think we should do this...” He told me that he was struck by the response: “Stop there – what I want is for you to tell me what you’ve done, not what you think should be done”. (Urban, visit 25)

The Consultant here is reported as saying that the nurse should do more than inform him of the ‘direction’ of a patient. Consultants in ICU apparently encourage nurses to expand their sphere of competence - although it needs to be noted that the Consultant did seem to want to be kept informed. Consultants come to trust the ICU nurses: at Metropolitan, where there was a large proportion of agency staff, a consultant made a distinction which indicated how he had greater trust in particular permanent and experienced ICU nurses:

[Ward round with doctors and senior nurses]. C (consultant): ... ‘Nil by mouth, that’s the general plan. Unless not an agency nurse, for example, if R [experienced nurse] is the nurse and she can do a clever thing... [Otherwise] keep it as nil by mouth...’ (Metropolitan, visit 17)

The on-going relationship between Consultants and nurses results in a joint and reciprocated loyalty to ICU, as opposed to the rest of the hospital. This is demonstrated by a Consultant being viewed upon as ‘heroic’, on behalf of the ICU and the nurses within it:

J (Staff Nurse) told me that Consultant Z can be very assertive. Once, when they had been trying to discharge a patient for several days the bed manager had repeatedly said “there are no beds”, but they had admitted patients from outside the hospital. The bed manager had said to them “If you want, get your Consultant to ring me.” Z had directly contacted the bed manager’s supervisor – “get me the on-call administrator.” (Urban, visit 24).

That I was told this story illustrates how the nurse was impressed by the Consultant’s action; the story itself shows how the consultant valued the contribution of ICU nurses



above the work of a (junior) hospital administrator. As I show in the next section, there are examples of non-ICU doctors (as well as administrators) ‘creating problems’ for ICU. The main point I want to draw from these data extracts is the way that doctors and nurses in the ICU demonstrate a high regard for one another.

Even where nurses found Consultants’ requests difficult or awkward, they still tempered their criticisms. For example, a Senior Nurse discussed the way different consultants favoured different sedation regimes, which meant that for each change of Consultant the sedation regime would have to be changed. She commented:

They are all individual practitioners and when you speak to them about why they follow one particular method they have got a good rationale... Although it would be nice if we did have a protocol which they would all adhere to... [but] I think... they wouldn’t hesitate if something worked really well... but at the moment, each of their regimes doesn’t work! (Interview, Senior Nurse, Metropolitan).

So criticisms of consultants are tempered by an awareness of their rationale(s). This is something which (I speculate) is enhanced by genuine collaborative work and close, routine interactions.

The ‘respect’ afforded to Consultants could also be due to ways in which their presence on the ICU is useful to nurses. For example, in emergency clinical situations they can be on hand to administer treatment. On two occasions I witnessed ward rounds being interrupted when a particular course of treatment had precipitated an adverse patient response. On these occasions the Consultants, accompanied by junior doctors, were called over to the bed in question, and when there implemented treatment and monitoring directly for up to half an hour. A further example of the way in which the presence of consultants is useful for the nurses might be termed ‘non-clinical’:

When R (Consultant) returned from lunch S (Staff Nurse) said “I need you in [a Side Room]” - the relatives were trying to take the body. But R’s view is that a Coroner’s Report would be required. (Urban, visit 15).

That is, the Consultant had more authority with the patient’s family to insist on keeping the body, in case it was needed by the coroner.

The respect seemed to be mutual. In general, Consultants tried to be sensitive to the nursing perception of either the organisational or clinical situation. For example, a sensitivity and awareness of a “nursing viewpoint” was expressed:

[During doctor’s hand-over] Consultant R said “It’s interesting, you know, I was with L [Staff Nurse] in [a side room] and she said ‘where are we going with [patient name]?’



I've not actually nursed him, but...' ... It's interesting if that's the prevailing view of the nursing staff...' (Urban, visit 14).

As well as, or instead of, demonstrating his awareness of (and respect for) the nurse's viewpoint, Consultant R could be partly 'enrolling' the nurse via her comments to strengthen his case to his colleagues that they *should* be "going somewhere" with this patient. Even so, that he could 'use' the nurse's comments in this way still demonstrates that nurses' opinions are generally taken seriously by doctors.

Another example also shows how nursing views are valued. On one occasion I overheard one nurse say to another at an individual hand-over:

"B (Consultant) said if anyone's not comfortable with stopping dialysis they would carry it on." (Urban, visit 19).

The planned treatment (or in this case, planned withdrawal of a treatment) is affected by nurses' opinions. Likewise, distinctively medical priorities, such as formulating treatment plans, are affected by nursing views, including their views of local (unit-level) organisational contingencies such as adequate nurse staffing levels:

Saturday morning. Apparently not much going on - not many changes: L (Consultant) was talking to K (Sister) about which patients could be transferred. Apparently none. Also they were 'one down' (nurse staffing)... They then discussed the ordering of dialysis: there was a question about who needs it first. Both L and K queried whether the patient in Bed 3 needed dialysis daily, but H (the patient's nurse) said he did... [Later] Consultant L explained to me his normal routine. He comes in a few minutes early and sits at the workstation ... [partly to assess whether] there are enough staff, "eventually someone talks to me". He explained to me that the 'nursing view' can be very different from the 'medical view'. "Medically, you might need something doing...[but] there's no use in planning, say, a tracheostomy if you're short of staff." (The Consultant previously on call had telephoned to suggest a tracheostomy for one patient, but L said that as they were short staffed today "that never crossed my mind")... 'You also have to think about prioritising treatment: for example, the three patients needing dialysis. Dialysis takes four hours. You've therefore got to allow fourteen hours work (as they have only one dialysis machine). Fortunately, there are three nurses who can dialyse patients.' (Urban, visit 5)

So the Consultant begins his day on-call by generally assessing the state of the unit, both on his own and in collaboration with the Senior Nurse, and he explicitly refers to the 'numbers of staff' and to the 'nursing view'. Despite efforts at planning 'clinically indicated treatments (for example, a tracheostomy or dialysis), the local organisational situation can take precedence, and can make such plans difficult to implement.

In this section I have so far presented *in situ* observational and conversational data which have shown informality and mutual respect between Consultants and ICU nurses, which can only really occur as the Consultants are routinely present on the ICU. They



are on-hand to deal with ‘crises’ (clinical or issues with relatives) as they emerge. Consultants also demonstrate a loyalty to the ICU nurses, and can act on their behalf in the wider organisation. Sensitivity to the nursing situation (staff shortages or the ‘prevailing view’) is common currency among medical staff. I now turn to Consultants’ descriptions of ICU work, which reveals more subtle processes whereby they retain their workplace authority and manage their on-going relationships with other staff, particularly nurses.

ICU Consultants variously, and at different times, described the (clinical) work of ICU as ‘complex’ or ‘uncertain’, on one hand, and ‘straightforward’ or ‘simple’ on the other. Precisely how it was described depended on whether they were talking to junior doctors, to nurses, or to me, and was different from the way that ICU nurses and junior doctors themselves described their work. I will firstly illustrate how the interactions between ICU Consultants and nurses seemed to be mediated through representing ICU treatments to nurses as ‘uncertain’ in some way.

Nurses often made suggestions regarding treatment. First, consider how a nurse ‘prompting’ and making a suggestion is treated by doctors with humour:

(Doctor’s hand over, in Seminar Room). The intercom buzzes from a Side Room, question for Consultant R. The nurse gives a series of readings, then says “I think he’s a bit dry”. R: “OK, give a bit of colloid then”. A short ‘thank you’ and the intercom was switched off. R grins: “Was that the right answer?” M (SHO): “the clue was in the question”. (Urban, visit 12)

The taken-for-granted reality *between doctors* (once the intercom is switched off) is that they know the correct answers. The use of humour suggests that some degree of disorder, albeit minor, had been introduced (perhaps some ‘boundary’ had momentarily been traversed) and ‘order’ needed to be restored. The nurse’s suggestion was adopted but the consultant needs to indicate his authority and superior knowledge: through humour (“was that the right answer?”) the episode is treated as technically unproblematic.

However, in a less exclusively medical context, a Consultant explicitly described discussions with the nursing staff as “negotiations”:

Chatting to L (Consultant), we were back on the main ward, by the main work station... When nurses come up with an idea he tends to be relaxed and say ‘OK, let’s go with it for now’. He said there were elements of kiddology - make everyone believe that they’ve got their own way. “after all, half of what I try doesn’t work”... ‘For example, J [Staff Nurse] wanted Temazepam for her patient - she thinks she’s got her



own way.’ At this point J perked up with: “If we don’t get our own way we’ll keep waking you up throughout the night.” L gave another example – they are supposed to have a ventilator strategy for weaning patients; the nurses sometimes raise objections if he changes it, but sometimes he has to because of a particular patient situation. Just as we were speaking, S (Staff Nurse) asked about the feed and tidal volumes for her patient. L said “OK - try it for a little while”. (Urban, visit 23)

This data extract captures the informality of Consultant-nurse interactions (“If we don’t get our own way we’ll keep waking you up throughout the night”) but I also want to note how Consultant L locates suggestions from (and discussions with) nurses about treatment within an overall context that “half of what I try doesn’t work”. The Consultant’s comments, including the phrase “elements of kiddology”, are no doubt aimed at me as an outsider, and I need to beware of adopting his entire viewpoint here as a ‘true’ representation. But it does seem that there *are* elements of “kiddology”: it is clear that he can override protocols, and in general the consultants are kept informed of the status of patients. The nurse coming up and asking about feed and tidal volumes does support the general thrust of his comment – that there was an openness to suggestions. My interpretation is that being open to suggestions is mediated through describing the problems of treatment as difficult or uncertain (“half of what I try doesn’t work”). Nurses suggesting changes to treatment can be *facilitated* by the claimed difficulties of finding treatments which work.

Bearing in mind the *between doctors* representation of nurse suggestions as (generally speaking) technically unproblematic, it seems that this could be a kind of inter-professional ‘functional uncertainty’, analogous to the doctor-relative functional uncertainty identified by Davis (1960) and Harvey (1996). Harvey commented that medical uncertainty and certainty are in large part socially constructed in discussions with patients relatives. Analogously, I want to claim that an emphasis on uncertainty here is in part socially constructed. “Half of what I try doesn’t work” is a particular representation and emphasis of the Consultant’s situation in ICU, of use in his discussion with nurses.

Couching the discussions in terms of uncertainty (or difficulty or kiddology) can be seen to be ‘functional’ because Consultants also described intensive care medicine as ‘simple’, suggesting that it was straightforward and uncomplicated rather than uncertain. The ‘simplicity’ of medical work in ICU was put to me by two consultants:

Consultant R: ‘Medical decisions in intensive care are not that difficult, especially once the patient has been admitted, because at that stage you can just wait and see. The more difficult decision is when to admit, what to say to relatives etc... Medicine is 75%



auto-pilot, 25% thinking on your feet. You don't have to be that clever...'  
(Urban, visit 15).

Consultant L: "I think medicine is quite simple really, so long as you do the simple things well" - this includes talking (to patients/relatives), examining (patient), tests (doing the right ones) - i.e. you need to go and see the patient... "It doesn't matter what's wrong with the patient, whether they've got some rare disease... Intensive care is not rocket science." 'ICU doctors believe we can spot a problem - ABC [Airway, Breathing, Circulation]' ... "we're not that bright". (Urban, visit 6).

The remarkably similar comments of these Consultants amount to saying that '[ICU] medicine is quite simple'. This is another (partial) representation of ICU work, directed at a social scientist outsider (both times out of earshot of ICU nurses). There are a number of possible reasons why they characterised ICU in this way to me, including an attempt at irony, but I suspect an implicit comparison with and criticism of more 'intellectual' or 'academic' branches of hospital medicine is being made. The second of these Consultants is the one who also told me (in the hearing of nurses) that "half of what I try doesn't work". For present analytical purposes it matters not so much how much either characterisation is more 'true' (although both cannot always be true) as to the possible uses of the representations. Depending on the context, it is conceivable that *either* representation could actually provide an organisational context in which discussions about patient treatment may be held with nursing staff, on a trial and error basis. However, the 'uncertainty' representation seemed to be favoured in discussions with nurses.

A collegial atmosphere and sense of collaboration is thereby fostered within the ICU. This is almost the inverse of the doctor-nurse game as typified by Stein (1967, *cf.* Stein *et al.* 1990). The general informality of the working environment and the acute illness of patients result in an openness of suggestions being made about treatment without nurses having to couch suggestions carefully to 'show respect'. The responsibility lies with the Consultant; the nurses can make suggestions which, at the very least, are listened to. Both doctors and nurses remain on hand, to monitor (in the case of nurses) and to intervene if necessary (in the case of doctors). An apparently relaxed attitude to trying different approaches to treatment or amending protocols is possible on ICU because of both the routine Consultant presence and the continual physiological monitoring by the nurse.

There is, furthermore, something not quite right about describing medical decisions in ICU as 'not that difficult'. Such a characterisation contrasts not only with the image of



ICU portrayed by *Bluff Your Way in Doctoring* (see page 97), but also with the junior medical staff viewpoint. Junior doctors called ICU a “Consultant-led service”, thereby emphasising the way that Consultants retain control over medical decision-making. The lack of a role for the most junior grade of doctor, House Officers, illustrates that ICU medicine is not simple.

In contrast with other clinical locales, House Officers, if employed on the ICU at all, are ‘supernumerary’. No House Officers were employed at Urban ICU, and at Metropolitan they came on to the unit for two week placements. Comments from House Officers were self-deprecating, even self-derogatory:

“I’m a House Officer, should be called House Plant, about as much use”  
(House Officer, Metropolitan).

“It’s quite a doddle [here]... as no-one lets you do anything.” (House Officer, County)

Senior doctors had a similar attitude. On one occasion, a Consultant was dividing up the morning’s tasks, and did not include the House Officer in the list of doctors available to perform the tasks. As well as indicating the superiority of experienced doctors, these off-hand comments indicate that ICU work is not ‘simple’, quite the reverse. Even junior doctors with some experience (Senior House Officers) have clinical roles which are restricted to monitoring, taking bloods and assisting with procedures. The even more severe restrictions on House Officers’ contributions indicates that medical work in ICU is not ‘simple’.

As I discussed in chapter five, a salient aspect of doctors’ work was formulating ‘plans’. This is emphasised by ICU Consultants, along with a normative view that the Consultants retain control by remaining intimately acquainted with treatment plans, as in the following comments (a longer version of this quotation has been seen in chapter five, page 134):

“I don’t like coming in to see a patient in the morning and I don’t know what the hell we’re supposed to be doing with this patient. What have been the goals for [however long]... they’ve been [in ICU]. Because we should have some direction or some plan for the direction we’re going... (Interview, Consultant, County).

In practice, junior doctors also emphasised the establishment of control, which is enacted from the moment a new patient is admitted, through recognised patterns and routines:

M (SHO) talks me through admission. ‘You have about an hour on bits and pieces, get the patient settled, take bloods, do admin. Then you start to assess the levels [of oxygen in the blood]. Stabilising takes about an hour. Then about an hour assessing “the



direction they're going in". All in all takes about 2-3 hours "at least" (Urban, visit 4).

These characterisations of ICU (medicine is 'simple', treatments can be 'uncertain', it is establishing 'control' through 'planning', it is 'too complex' for inexperienced junior doctors) are not consistent. I do not feel the need to completely reconcile these contradictory representations (Gilbert and Mulkay 1984). The ICU Consultants are merely emphasising different aspects of ICU work in different contexts. In 'socialising' junior doctors into ICU medical work, they emphasised planning. In discussions with ICU nurses, they emphasised uncertainty and trial and error, which seemed to have the effect of facilitating a collaborative working environment. With a social scientist outsider, they emphasised the simplicity of ICU medical work – perhaps making an implicit comparison with non-ICU medicine. Whether treatment uncertainty is emphasised (as with the nurses) or planning is emphasised (as with the junior doctors), in practice the Consultants retain control over and are made aware of decisions, irrespective of being 'open to suggestions'. All these are partial representations, although through my own observational evidence I would place greatest weight to the view that ICU is an environment in which, generally speaking, careful control is most emphasised. (This is illustrated, for example, by the routine Consultant presence and the way they like to be kept informed). I return to some methodological implications of Consultants' representations in chapter nine.

In this section we have seen how the routine Consultant presence, the informal working environment, sensitivity to 'the nursing view', the openness to suggestions, and the close working between ICU Nurses and Consultants all facilitate an enrolment and incorporation of ICU nurses into intensive care medicine. The data have also indicated a loyalty to the ICU rather than the hospital. I analyse the relationships and connections between ICU and the other parts of the hospital, and the relationship between Senior Nurses and junior doctors, in the next section.

### **Professional and organisational boundaries**

Whereas the Consultant-Staff Nurse *interactions* seemed to be characterised by mutual respect and loyalty, the *content* of their work did not overlap. In this section I demonstrate that junior doctors and Senior Nurses have several domains of overlapping



and routine close working, particularly with respect to organisational and administrative work (as well as clinical work). Reiterating the point demonstrated in the previous section, this work is conducted with close reference to ICU consultants, who are often on-hand if not actually present on the unit. It is important, therefore, to note that although the data explicitly relate junior doctors and Senior Nurses working closely together, both groups are doing this *on behalf* of ICU consultants. The aim of the analysis is not to elucidate ‘boundary-blurring’ (Allen 1997) *per se*, although that can clearly be seen, but rather possible causes and consequences of the overlapping and close working. Given the emphasis on organisational and articulation work in the early part of this section, in the later part of this section I turn to how relationships external to the ICU are managed. The ICU is a well-defined organisational subunit and relationships outside of the ICU need to be creatively managed. I focus the analysis on “problems” to be overcome in organising the ICU’s relationships with the rest of the hospital. There are numerous organisational contingencies, caused by other medical teams and non-patient processing areas, to be managed.

But first, I want to consider the context of the close working between junior doctors and Senior Nurses, and to back up my point that this work is conducted with reference to Consultants. Even when Consultants are not present on the ICU, they are still expected to be ‘on-hand’, as illustrated by the comments of one junior doctor who told me about being ‘on call’ overnight:

M (SHO) said she tries not to call out Consultants unless absolutely necessary (and sometimes it is necessary). In turn, she says, the “nurses here are very good, they try not to disturb you [i.e. if asleep] unless absolutely necessary... that isn’t always the best thing, as sometimes you wish you could have been disturbed earlier.” (Urban, visit 4).

Although she did not put it in these terms, there is considerable symmetry in the SHOs comments: the nurses can call her out; she can call out the consultant. Without necessarily following this representation precisely, there is clearly an expectation that there are categories of clinical work that either nurses or doctors, in general, can do; but that sometimes the work might become difficult in some way: if “absolutely necessary” someone with more expertise is called out. The Consultant is clearly expected to be available, even in the middle of the night.

Junior doctors and Senior Nurses are given things to do by consultants at the ward rounds, which necessitated them working closely together. The junior doctors tasks are given them directly, whereas the Senior Nurse must take responsibility for the activities



of the nurse at the bedside. Problems can arise in this close working relationship, from the point of view of both doctors and nurses:

D (SpR) comments on the fact that I had been talking to J (Charge Nurse): “there’s a possible problem where you have experienced nurses with inexperienced doctors” – ‘the nurses may boss the doctors about.’ (County, visit 3).

The SpR here seems to be concerned that his authority might be undermined by a ‘bossy’ experienced nurse. SpRs spend six months on rotation on ICU as part of their training. They therefore have less ‘experience’ than senior ICU nurses. Conversely, experienced nurses could find the assumed delegation of clinical responsibility stressful at certain times:

While the doctors are away from the unit, N (Charge Nurse) says to me: “one of these times is when it’s difficult”. [SC: Why’s that?] Basically the doctors are all away, he has responsibility for the patient just admitted and he has had to make decisions which he feels are not effectively a nurse’s to make (e.g. deciding which drugs to give). (Urban, visit 24).

Despite this being a “difficult” time the Charge Nurse did make these decisions anyway, with the expectation that the doctors would return to the ICU shortly and his decisions would be ‘validated’. There are areas of overlap, and difficulties in the grounded implementation of that overlap.

Particularly noticeable was the close working between Senior Nurses and junior doctors over organisational matters, for example around the period of a new admission:

J (Charge Nurse) relays the details to D (SpR) - name, date of birth. D gives the thumbs up as J relays the details from the phone. They then exchange information with regard to a patient. J: “Tube D?”. “Yeah”. D continues to fill in the form... There is a phone call about the drugs – D checks with J. There are “contraindications”. J says “it always worries me when they ask about those”. D replies “yeah, I might take a wander down there later” (County, visit 3).

This might be considered evidence of a ‘doctor-nurse game’, with the Charge Nurse ‘subtly’ prompting the SpR about the ‘contraindications’. But as likely is that the nurse is reinforcing a certain approach and course of action.

Normally the relationship between a junior doctor and a Senior Nurse was characterised by joint effort, as in the following example where a considerable degree of contingency planning was made. The precipitating event was a patient recently admitted to the hospital in an emergency, currently in the operating theatre. It can be seen how practical contingency arrangements are jointly planned between the junior doctor and the Senior Nurse:



(9:25pm) Telephone call, L (Staff Nurse) answers, she passes on to P (SHO): “P, there’s an anaesthetist on the phone, it sounded bad”. P comes round and takes the call, spends a while listening: “... Right... Oh God... Hmmm... Right... Cool. That’s fine. What’s he got?” N (Charge Nurse) wanders up to the workstation, leans over and says quietly (while P is still on the phone) “[There] aren’t any beds to transfer to”. As soon as P finishes on the phone N says: “Only contingency we could think of the other night, as [HDU] was full, was theatre and recovery... not ideal – on HDU they’ve got five on ventilators”. P: “Trouble is these two” (he indicates beds 3 and 4) “are quite high maintenance aren’t they?” P phones the regional bed monitor – there are no available ICU beds in the region. P: “Triple A<sup>1</sup> in theatre, lots of medical problems...”. N: “See if HDU can transfer out.... [because] if in theatre and recovery, you’ll need two nurses down there.” (Urban, visit 24).

In the event of an intensive care patient being outside the ICU itself, two nurses are required: this is to ensure not only ‘1:1 nursing’, but also to provide for a ‘runner’ to fetch drugs (and perhaps doctors) as required. Even if this ‘runner’ was a health care assistant rather than a qualified nurse, this would have left the ICU itself very short-staffed: on the open part of the ICU three nurses (down to two as nurses take their breaks) would be caring for six patients, of whom at least one is apparently ‘high maintenance’ and one is a new admission (which is likely to mean a higher nursing workload). Hence the Charge Nurse’s comments that they should try to get HDU to ‘transfer out’. But the HDU, with a staff ratio of one nurse for two patients, cannot take too many ventilated patients (who are normally regarded as requiring one nurse each): it is assumed that the ‘five [patients] on ventilators’ would already have taken up most of the HDU nurse complement. Following this phone call, the junior doctor did successfully negotiate a transfer of one of the patients in intensive care to the HDU, by discussing with the HDU nurses which of their patients could be discharged to a general ward. This freed up a bed without having to keep the emergency patient in ‘theatre and recovery’. Although the ‘contingency planning’ mentioned by the Charge Nurse was not actually utilised that night, it clearly forms part of the accomplishment of organisation in the ICU, and I witnessed several discussions involving the Senior Nurse, junior doctors and a Consultant, along these lines.

Following the above referral, having completed the necessary administrative and negotiation work in ensuring that the admission would occur smoothly and having informed the consultant, the SHO said “Right, time for a brew”. The patient would not actually arrive on the ICU for another hour. Most of the articulation activity goes on

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<sup>1</sup> AAA: Abdominal Aortic Aneurysm. Weakening of the wall of the abdominal aorta. (Extremely serious if it bursts, but may be detected early and repaired electively, in which case the patient would often require ICU post-operatively).



before a patient is actually admitted. In relation to this extract, it is worth noting both that the Consultant was kept informed (he was, at the time, in an ICU office) and that ‘waiting’ is an expected, normal part of admission and other work in the ICU.

‘Waiting’ occurs in several ways in ICU. Medical investigations carried out in series can entail long periods of waiting for results or waiting to monitor the effects of earlier treatment. However, whilst the ‘waiting’ might be considered stressful for staff (in that they are waiting for the ‘unknown’) I did not detect stress at these times. Rather, there was a modicum of excitement and looking forward, which can be attributed to the controlling nature of intensive care. Patients coming in to ICU are very often ‘stabilised’ in advance: an emergency admission would have been treated in A&E and theatre; a transfer from another ICU will be stable; and even a patient on a general ward, whose condition suddenly deteriorates, will be stabilised at their original location before admission to ICU. As I overheard one SHO say to a new House Officer: “the thing is on intensive care, nothing’s a rush – never a rush” (Metropolitan, visit 11).

Such enforced waiting sometimes contrasts with an activist approach of ICU doctors.

As one Consultant put it to me:

Consultant L told me he had felt quite resentful that a patient hadn’t died sooner, once they’d realised that he was going to die, as they had another patient they were waiting for. Following the patient’s death, the new patient was admitted (from Theatre, previously HDU) at about 11.45pm. But “at 4pm yesterday [we] were quite bored, thinking what can we do now – waiting around for [patient] to die.” (Urban, visit 6)

So waiting can cause problems, although in general it was treated quite casually (“Right, time for a brew”). It can also be seen that Consultants retain a close proximity to decisions about admitting a patient. This is effectively administrative *and* clinical management, through routine, partial, temporary delegation of these matters to Senior Nurses and junior doctors.

Other ways in which junior doctors and senior nurses interact are indicative of a *differential* ‘delegation’ from consultants. For example, the Senior Nurse encouraging a new junior doctor (for example, explaining how to use monitoring equipment), or even just chivvying them along when she feels they’ve been too long on their hand-over:

We went into the main ward area when D (Sister) came round to the Seminar Room and said “Come on you lot!” – she wanted some kind of review on Bed 6.  
(Urban, visit 24).

There is a tension here in the role of the Senior Nurse. She is (managerially)



responsible for the routine functioning of the ICU, so can instruct the junior doctors to get back to work. But she also needs the junior doctor's authorisation for clinical courses of action, or may need clinical advice, as illustrated by the following data, recorded a few moments later:

D (Sister): "Just suggest one more thing, P, then we'll leave you alone... Sedation Bed 1 – the nurses want to turn it off"... P (SHO) nods. D: "Quick, S [nurse], he said 'yes' - before he changes his mind." D then checked on behalf of another nurse that she'd asked to take out a tracheostomy tube... D says to M (SHO): "M, I don't think it does, but does [drug] give you tachycardic [episodes]? M wanders over to the patient to look, saying "No, it lowers the blood pressure, that's all". (Urban, visit 24).

In many areas of responsibility other than clinical, the Consultant's role seemed to be interchangeable with the Senior Nurse:

A Consultant from nearby ICU, which has just transferred a patient for emergency specialist surgery later in the week, telephones and asks to speak to the Consultant on call, but he isn't there. She then asks to speak to the Sister, who is busy but says she will call back; the message is that 'it's a political matter'. She phones back a few minutes later, from the ICU office. (Urban, visit 13)

The Consultant from the nearby ICU did not ask to speak to a junior doctor: the "political matter" was expected to be more appropriately handled by the Senior Nurse, indicating that my interpretation is not limited to the ICUs I observed.

The routine and comfortably implemented overlapping work of the Senior Nurses and junior doctors has been most in evidence concerning patient admission. More extreme organisational matters (e.g. the "political matter") tend to be the province of Senior Nurses, whereas more serious clinical matters tend to be the province of the junior doctors. I now focus more explicitly on the relationships with the rest of the hospital.

Modern hospitals consist of "variegated workshops" (Strauss *et al.* 1997[1985]) – a particularly appropriate term when considering the multiple non-patient processing areas. There are, for example, equipment processing areas, on whose working availability the ICU is dependent. In the following data extract, two pieces of equipment were malfunctioning. The "chute" is an air tube used to send blood samples to a laboratory elsewhere in the hospital for analysis. The ICU also has a small blood gas analyser of its own, with which there was also a problem:

The Ward Clerk is trying to find out when the chute will be back in action – persuading them "we need to know when it will be back". P (SHO) phones some technicians about the blood gas analyser, says to D (nurse) 'it may be later today'... D: "They work about three hours earlier than everyone else..." It transpires that the analyser will be ready tomorrow. But it was not a massive problem, as just two of the analysis tubes were playing up, not all of them. (Urban, visit 24)



Many normal, routine processes can therefore be affected by a dependence on other areas of the hospital.

The following examples demonstrate how the ‘patient processing’ work of ICU is contingent on activities elsewhere in the hospital organisation. The most common liaison is with the operating theatres, and the following example is for a patient awaiting surgery:

At the bedside of patient number one, Consultant B asked: “Do we know what time he’s on?” Junior doctor: “No, we know he’s on the list, we just don’t know what time”. Consultant H makes a joke about it being like airlines – “they overbook by 10%”. To which one of the nurses replied “It’s OK, we’ll be here all night!”... [Later]: “She was supposed to go to theatre an hour ago.” “Oh, that’s theatre time.” (County, visit 2).

Hence the nurses express a confidence about dealing with such a contingency, and ICU is “ever ready” as a ‘24/7 service’. This is a somewhat passive response to the situation (not just by the nurses – the Consultant’s humour also conveys a phlegmatic attitude). On occasion, though, there is a perceived need to be proactive: the following example shows a more aggressive response to a problem:

(12.30am) Consultant B is on the phone: “Is this guy for resus or not? Then what are we doing? Are you speaking to the Consultant? That’s bollocks! Why is this happening on a Friday evening?... I know it’s not your fault.”... ‘Emergency tracheostomy - not done by us.’... Ten minutes later B takes a call from the ‘ENT guy on call’: “Hello – hi. What’s this I hear about an emergency tracheostomy?... What do YOU think’s happening?... We’ll intubate... I’d rather he got on with it now than wait until four in the morning.” (County, visit 3)

It is interesting to note that in the former case the patient was in ICU awaiting transfer out; in the latter case, the patient is outside the ICU but (apparently) requires a tracheostomy which would normally necessitate admission to ICU. Dealing with outgoing patients is in general more straightforward than potential admissions who might be seen as disrupting the order imposed by the ICU.

On another occasion, a Consultant Surgeon’s extra work postponed a meeting with a patient’s relatives:

[In coffee room, 7pm, with B (Consultant) and two doctors]... A nurse comes in - the Surgeons have telephoned saying they’re busy, can’t come [to review her patient] this evening. Anytime from 9am tomorrow. B groans, asks the nurse to explain to the relatives. (Metropolitan, visit 7).

So ICU work is to a large extent contingent on the work in other hospital workshops and by other hospital teams.



Concentrating on the administrative, ‘patient processing’ arrangements, we have already seen there is much liaison and articulation work (Strauss *et al.* 1997[1985]) required at the time of admission and discharge. At discharge, liaison is required with medical teams and Ward Managers. The ICU doctors would have to “sell the patient” to a medical or surgical team within the hospital. This took up a fair amount of discussion on medical ward rounds. It was not often a problem for patients who have come into ICU following surgery – they are discharged back to the care of the surgical team. But for patients who have been admitted for a medical emergency, the ICU team needs to consider which ‘medical team’ would be appropriate. It was explained to me that the term “selling” the patient was something of a misnomer, as the team to whom the patient was referred would not normally be able to decline the request. Nevertheless, an effort was made to ‘spin’ the details to suit the interests of the medical team:

“What you do is, go to the Consultant’s SHO and say ‘we’ve got a patient, he’s got this problem your Consultant is really interested in....’” (Urban, visit 23)

The fact that the responsibility for initiating the discharge belonged to the Consultant was seen as a good thing by some nurses (this was noted by a nurse temporarily on placement from an ‘open’ HDU). But while the ICU doctors were finding an appropriate medical team, Senior Nurses on the ICU would be expected to liaise with Bed Managers and Senior Nurses on other wards.

Here, to the outsider, is one of the strangest aspects of hospital organisation – the dual hierarchy and necessity for double liaison for discharge. One set of liaison is required between medical teams, and another with nurses who manage a ward. This was particularly noticeable for an ‘emergency transfer’ to another hospital one night (but similar ‘articulation’ was also required for within-hospital discharges from ICU):

(c. 2am) A post-surgery patient on a general ward has deteriorated; the ICU Consultant says he requires and is appropriate for intensive care but the ICU here is full. The regional ICU bed information service gives names of nearby ICUs with a free bed. The Senior Nurse at one of them okays it, but their Consultant must also be informed. So, additionally, must a surgical team at that hospital, and that request must be made by the on-call surgical SpR here. (Urban, visit 24).

Having several lines of responsibility (in this example, ICU nurses, an ICU Consultant, the surgical team) appears to be inefficient in creating extra communication work.

But, within the ICU itself, there are ways in which the duplicate communication lines can help. Doctors can be reminded to undertake particular tasks; the clinical understanding of nurses can also clarify instructions. For example, I witnessed doctors



checking the nursing notes when they couldn't "find the answer" (to the question of when the last time lines had been changed) in the medical notes. On several occasions I witnessed nurses double-checking patient prescriptions with doctors, particularly for post-surgical admissions, where the drug prescription had indicated continuing with the medication the patient had received in the operating theatre. In one instance the nurse noticed that a drug had not been given in theatre, when according to the prescription chart it should have been. In another instance the nurse queried a large dose of a particular drug; it was realised that such a dose had been appropriate in theatre but was not required for that patient after surgery. In general, then, the duplicate lines of communication provided a 'safety net', noticeable when it failed:

Back to bed 6, there is a big discussion about 'communication': B (consultant) had given an instruction about the chest drain. Started off being a dispute about what had been instructed, B saying he'd asked for something to be done seven or eight times, but it has actually happened only four or five. B's instructions were not carried out for some reason. Communication problem was in that it wasn't mentioned by an SpR at the medical hand-over. B: "oh, so it's a communication issue". S and T (nurses) exchange glances; T (not quite under her breath): "Exactly. Communication black hole". B carries on with his instructions. (Metropolitan, visit 9)

Therefore, within the ICU the duplicate line of communication has an additional function of potentially enhancing the ability to treat patients effectively, and this is also made possible by the large numbers of staff. In part this is because the communication relates to much the same work, and the procedures going on. In less acute areas the nursing and medical work would overlap less, but in communicating outside of the ICU the duplicate line of communication is made necessary by the organisation of the modern hospital. At Metropolitan, the duplicate communication-informal aspect was being neglected – an unintended consequence of merging the medical and nursing notes.

It is clear from the foregoing data that there are many aspects of ICU which are dependent on the goings-on elsewhere in the hospital. I now briefly consider how the Consultants *represent* the way that ICU is embedded in the wider hospital organisation.

### Representing the situation of ICU in the hospital

Officially, ICU is portrayed as a site where therapy, beyond normal hospital care, is given to patients who are in serious stages of disease but for whom there is an expectation of recovery. But sometimes, patients are admitted whom the staff feel are



unable to recover, which seems rather perverse. One Consultant argued that this was due to power relationships within the hospital:

Consultant B: “*Comprehensive Critical Care* [DH 2000] talks about ‘selecting patients’ but that’s very difficult to do, when you’ve got a sick patient on the ward. And one [of the] criteria is supposed to be ‘reversibility’, but the only completely non-reversible organ is the brain - brain injury. Even the liver [is reversible to some extent]. We used to be able to say ‘no, this patient won’t do’ [*i.e.* won’t survive intensive care]; but now ICU is a ‘service provider’ to physicians and surgeons who will say ‘do not give up on this patient’”. (Interview, Consultant, Urban)

This particular ICU Consultant is claiming that there is little room for negotiation about patient admission, despite recent emphases on reversibility, and as a result of the organisational context of ICU as a ‘service provider’ to medical and surgical teams whose performance is monitored. He went on to say that ICU is not ‘assessed’ itself, but that, for example, there were audits of surgical deaths and waiting lists. The organisational context is therefore that surgeons (and perhaps, to a lesser extent, physicians) now have more influence than they used to, since they can deem that their patient needs intensive care. Their claim will be supported by hospital management, as the hospital is ‘assessed’ on surgical death rates and waiting lists. Particularly important is that at the level of hospital organisation, ICU is apparently a ‘service provider’, not to patients but to other medical and surgical teams.

However, as we have seen (page 224), referrals could be handled aggressively by ICU Consultants, and on another occasion I did witness a patient being refused admission:

Y (SHO) came back into the Seminar Room with a yellow post-it note regarding a phone call he made as a result of a bleep. He reels off the details. Consultant R phones, speaks to a Surgical House Officer. It’s about a 79 year old who’s “got dementia”. The surgeons wanted to operate for a hip replacement and reserve an ICU bed. The House Officer said they wanted to operate and then dialyse. From R’s tone, I gathered that he felt that this was rather out of order; he had a two-pronged response: “It would need a lot of juggling around at best... [I’m] reluctant to bring in a 79 year old with Alzheimer’s and renal failure... [I would urge them to] reconsider”. When he came off the phone he said he thought that the surgeons may go ahead anyway and “create a crisis”, but he hoped that the anaesthetist would refuse to anaesthetise. (Urban, visit 15)

Admittedly the ICU Consultant on this occasion was not speaking directly to another Consultant, but the message was heeded and this patient was not admitted to ICU; the operation did not, in fact, proceed. Consultant R in this extract had what I perceived as a ‘two pronged response’, consisting of ‘organisational issues’ (“juggling about at best”) with ‘clinical need’ (“79 year old with Alzheimer’s and in renal failure”). There does remain scope for ICU Consultants to decide which patients will be admitted to ICU, despite protestations to the contrary. ICU Consultants still have a ‘trump card’ of



‘clinical need’, and local negotiation is still possible, despite the shifting organisational political context.

In summary, ICU Consultants delegate work and responsibility to other ICU workers, but remain close at hand. In their delegation, especially to junior doctors and Senior Nurses, the central referent remains the ICU itself. Middle-ranking staff working jointly on articulation activities serves to increase the salience of the ICU as the central referent. Indeed, the symbolic *organisational* boundary (ICU-rest of hospital) is more in evidence than a *professional* boundary (doctor-nurse).

## Discussion

There are two linked characteristics of the ICU’s articulation with the rest of the hospital worth noting. First, ‘administrative and medical lines of authority’ (Freidson 1988[1970]: 117-20) are conflated. Second, ICU Consultants have retained a high degree of ‘clinical autonomy’, in contrast to Consultants in other specialties under pressure from ‘bed management’ (Green and Armstrong 1993, 1995). Using B. Turner’s (1995: 141) framework for the strategies by which the medical profession ‘dominates’ other health care occupations (subordination, limitation and exclusion), we can see the success of ICU medicine in this regard. Turner’s strategies are generally applied at a macro-level, and, as Elston (1991: 62) has commented, there is not a great deal of evidence on how parallel strategies are exercised at a micro-level. However, from the foregoing data, it can be seen how ICU consultants limit the influence of other health care workers and retain their individual autonomy.

The most obvious example is the *subordination* of other health care professions, for example the way that ICU Consultants refused to adopt Speech and Language Therapist’s protocols (see chapter five, pages 131-2). More subtle, however, is the relationship with ICU nursing, as this is slightly different from subordination. What appears to have happened is what one could call *incorporation* into a joint ‘ICU project’, over which ICU Consultants retain control. There are plenty of examples of collaborative work and a general respect for nursing which is achieved by carving out ICU as a separate entity. The physical boundaries and key-pad entry obviously help, but we should not assume that achieving ‘closed’ ICUs has been a straightforward



process. It is supported by studies (see chapter two, pages 50-1), themselves done by ICU practitioners, and seem to me to be an outcome both of locally organised efforts *and* a burgeoning intensive care ‘research community’. The ICU thereby becomes a well-defined sub-unit of the modern hospital. The ICU medical ward rounds, for example, are often attended by the Senior Nurse. This would be extremely difficult to manage on a general ward where several medical teams might be visiting at once, and helps to keep the ICU as the central referent. The paradox is that Consultants’ clinical autonomy is increased by the close involvement of nurses in the routine work of ICU. The ICU nurses’ perspective is so closely integrated with the Consultants’ that an enhanced role for nurses does not constitute a threat to Consultants’ own autonomy but serves to increase it: an exemplary case of workplace empire building.

A joint medical-nursing ICU ‘project’ also helps to explain why, as Lapsley and Melia (2001: 739-40) observed, the “tight-knit teams” in intensive care are able to exert an influence *contra* other areas of the hospital, in particular hospital administration. This results in *exclusion*. Freidson had argued that medical authority ‘usurps’ administrative authority by claiming an ‘emergency’, having the power to label ‘ambiguous events’ as emergencies. In these terms, ICU is the ultimate in medical authority, since ICU Consultants have the power to *validate* other medical practitioner’s ‘labelling of emergencies’. Thus ICU practitioners generally by-pass hospital administration altogether: because of the acute nature of their referrals ICU Consultants retain both medical and administrative responsibility. Negotiation with bed managers only occurs when attempting to discharge patients, not admit them.

In this way ICU has resisted the recent trend, through the introduction of ‘bed management’, whereby the hospital as an integrated whole (rather than the ward) has become the referent for emergency admissions (Green and Armstrong 1993, 1995). Managing emergency admissions had traditionally been part of the routine of everyday clinical practice, but following the Griffiths Report (DHSS 1983) this constituted a problem, as emergency admissions are not amenable to rational management. Green and Armstrong argued that central to overcoming this ‘problem’ was the introduction of ‘bed management’ - ‘good bed managers’ had a ready awareness of available beds throughout the hospital. Bed managers became able to act as ‘neutral, honest brokers’ between Consultants from different specialties, with the result that they had considerable control over hospital admissions (elective or emergency). The central



aspect of consultant 'power' which had been decision-making power over which patient were to be admitted to 'their' beds, was removed. But ICU Consultants have not lost power in this way. The beds in ICU are firmly under ICU Consultants' control, and they have successfully resisted the trend by marking out a distinctive territory that is their own, where they retain the power to determine admission.

Determining admission occurs in discussions with non-ICU medical staff, and with this group ICU Consultants can be seen to operate a form of *limitation*. The influence of other medical specialties is limited both by creative local tactics (I presented the example of the two-pronged "juggling about at best" and 'clinical need'), and by the increasing move to closed ICUs, whereby ICU Consultants have prime responsibility for ICU patients and the referring team are given a limited consulting role – and that only at the ICU team's behest. I would speculate that this is related to the symbolic media power of ICU. The myth of ICU is that it can 'bring people back from the brink of death'. This myth can be shared by non-ICU doctors: an SHO who had just started working on the ICU told me:

'When you work on the general ward you regard the ICU people as wonderful, as you have a very ill patient in front of you, who's basically getting sicker, and then the ICU team come and take the patient away. A few days later you get them back.'  
(Urban, visit 1)

Such a myth is elevated within ICU circles to the form that ICU rescues patients from "sub-standard care on the wards" (McQuillan *et al.* 1998). A telling example was the way in which a 'referral' late one Friday night was summarised to me as 'someone wants an easy weekend' (see page 125). This kind of comment adds legitimacy to ICU Consultants' limitation of other specialties' claims on ICU beds.

ICU Consultants can be seen to have enacted several strategies (subordination, incorporation, exclusion, limitation) with regard to groups of health care workers which have the potential to challenge to doctors' autonomy. Particularly effective is the strategy of incorporating ICU nurses into the 'project' of 'intensive care', as this results in tight-knit teams. Such a 'socio-political' strategy would seem to take advantage of, and reinforce, the way that ICU is marked by firm physical boundaries.



## Summary

In this chapter I have shown several examples of how ICU Consultants control its organisation. Of note are their routine presence on ICU and involvement in admission and treatment decisions. There is also a high degree of interchange between staff for certain functions and the close co-ordination of work, particularly between junior doctors and Senior Nurses. The close interaction across the two groups is patterned in particular ways. Management is taken on by the Senior Nurse and Consultant. In terms of clinical work there is considerable overlap between Staff Nurses and junior doctors, whereas articulation work between ICU and the rest of the hospital entails close work between Senior Nurses and junior doctors. This working closely together is one means whereby the organisational boundary of ICU is symbolically enhanced. Although ICUs are fully embedded in the modern hospital, its Consultants have retained a certain degree of 'clinical freedom', resisting both hospital administration and other medical teams. A joint 'ICU project' between doctors and nurses is forged through a loyalty to ICU, rather than the hospital. Thus ICU consultants can be seen to have operated a subtle process of *incorporation* to maintain their autonomy and authority.

In the next chapter, before reviewing the thesis as a whole, I relate the findings of this explicitly back to the quantitative empirical studies reviewed in chapter two, which enables me to demonstrate the potential of ethnography to health services research.



## Chapter Nine

### Summary, Implications and Conclusion

In this thesis, through detailed empirical analysis of the clinical locale of ICU, I have evaluated and developed arguments, concepts and themes in medical sociology. This has enabled me to make two distinct but related contributions to knowledge. First, I have demonstrated the usefulness of ethnography for health services research (HSR). Second, I have contributed to medical sociology by elaborating on the themes of uncertainty in clinical practice, the craft character of medical work, the contribution of nursing to acute care, and inter-professional and inter-organisational relationships. In this chapter I restate my findings in the context of making links with issues in HSR and prevailing debates in medical sociology.

This chapter is structured in four sections. First, the usefulness of ethnography to HSR is demonstrated by relating my findings to the quantitative organisational studies reviewed in chapter two. I then summarise my findings and reiterate the contribution to medical sociology. In the third section I highlight areas which I did not specifically analyse, but where my data suggest alternative lines of sociological inquiry. In the fourth and final section of this chapter I conclude the thesis by specifying the utility of Actor-Network Theory (ANT) and explicating a theme which links the thesis as a whole: the practical, action-oriented, *purposeful* character of clinical work.

#### **A sociological contribution to Health Services Research**

The burgeoning HSR field of service delivery and organisation can benefit from ethnographic research. There is a tendency in HSR to identify organisational ‘factors’ under a rather reductionist epidemiological logic, whereas ethnography can demonstrate the complexity of work and organisation. A related point is that many (if not all) of my



substantive findings would have been difficult to identify relying on other methods. In this section I support these assertions by relating my findings (mostly from chapter eight) to some of the results of the quantitative studies reviewed in chapter two.

An ‘organisational factor’ which has been found to be associated with improved patient outcome following intensive care is consultant staffing (*e.g.* consultant presence on the ICU; the adoption of ‘closed’ units). Two explanations for this association have been proposed in the medical literature, the first by Pronovost and colleagues (2002: 2151):

A conceptual model explaining these findings is that physicians who have the skills to treat critically ill patients and who are immediately available to detect problems and institute therapies will prevent or attenuate morbidity and mortality.

Vincent (2000: 695) was more comprehensive:

specialty trained intensive-care doctors... apart from their clinical expertise, can facilitate communication and coordination among the many specialists and other members of the intensive-care-unit (ICU) team, provide discrimination in assessing admission and discharge decisions, and offer valuable insight into difficult ethical decisions.

While these explanations are plausible, I want to suggest a more subtle and less medico-centric explanation. In chapters seven and eight I suggested that as doctors and nurses work closely together for extended periods of time their mutual respect is enhanced, they communicate often and they share viewpoints and opinions. Nurses have opportunities to learn about acute physiology, and doctors come to rely on a highly trained group of nurses. The interpretation of biomedical data by ICU nurses is not only rendered more effective when they have a consultant to call upon, but there was also a clear suggestion from nurses themselves that consultants encourage them to expand their sphere of competence. So it is not just that consultants are often present on the ICU to “institute therapies” (Pronovost *et al.* 2002), nor even that they “facilitate communication and coordination” (Vincent 2000). It is also that they can act as clinical leaders (Carmel 2003), encouraging the development, in terms of knowledge and skills, of other staff. Through ethnographic research, therefore, I have been able to make an explanatory link between ‘teamwork’ (which was also, although less measurably, associated with patient outcome), consultant presence, personal development and patient outcome following intensive care.

A second implication of my findings from chapter eight presents a possible problem in current policy endeavours regarding the organisation of acute and critical care. I



demonstrated that a shared nursing and medical perspective in ICU is explained at an organisational level: there is improved inter-professional working which I suggested was related to the ICU's physical and organisational boundaries, and a concomitant loyalty to the unit itself. However, a current policy aim is to move ICU expertise into the rest of the hospital explicitly trying to make the hospital, rather than ICU, the central referent (DH 2000: 16). If the policy succeeds, allegiance to ICU may be lessened, and thereby the close inter-professional working – an achievement of ICU – might be under threat.

A third implication for HSR I want to draw from chapter eight is that research might be unduly influenced by particular rhetorical representations of clinicians. One example is the putative 'stress' for ICU workers (Downey 1972, Guntupalli and Fromm 1996, Goodfellow *et al.* 1997, Audit Commission 1999, Fontes Pinto Noaves *et al.* 1999, Sagie and Krausz 2003); something which I did not observe myself. Evidence from fieldwork and interviews indicated that ICUs were controlled and sedate rather than chaotic and stressful. The persistence of such concepts as 'ICU burnout' in the literature is indicative of how ICU is perceived as a special case. I do not dispute that ICU doctors and nurses work hard, but I would question whether their work is more stressful or likely to cause 'burnout' than other areas of acute care.

HSR inevitably involves collaboration between practising clinicians and specialist researchers (Black 1997), and it seems to me to be right and proper that practising clinicians are involved in setting the agenda for HSR. However, health services researchers need to ensure that their understanding of health care is not framed entirely by practising clinicians' representations of health care work. As I showed in chapter eight, such representations are partly dependent on their context. I am not suggesting that clinicians who have been involved in HSR have been deliberately disingenuous, but they are likely to have strong opinions on the formulation of research questions, and HSR needs an independent perspective to verify or modify participants' representations. As an example, I offer my comments on Pronovost and colleagues' (2002) and Vincent's (2000) explanations concerning the improvement in patient outcome with dedicated ICU physicians. While their explanations are plausible, such that a survey researcher might try to operationalise and test them, they are the explanations of intensive care doctors. It can be seen from my findings that important facets of internal working relationships in ICU have been omitted. That said, sometimes participants'



representations can be extremely apposite, as I report below.

### Models of organisations

In applying ‘models’ to ICU organisation, a traditional aspect of organisation and management research, the model adopted or adapted might be influenced by the ways in which ICU practitioners discuss its organisation. One aim of this thesis was to describe how organisation is achieved, and I now want to comment on the ‘models’ which have been applied to ICU organisation in the light of my findings. Although I addressed some of the problems with these models in chapter two I am now in a better position to point out which are more or less likely to be useful in evaluative research.

In the literature I identified four models which have been used or referred to in evaluative studies of ICU organisation. These were the ICU as: an uncertainty reducing unit (van Rossum 1998); a combination of Mintzberg’s (1983) ‘Professional Bureaucracy’ and ‘Adhocracy’ (Reis Miranda *et al.* 1998); a safety-critical organisation (Sexton *et al.* 2000); and a discretionary-type operating pattern (Mitchell *et al.* 1996). The models which have been applied to ICU have either failed to capture some fundamental features or over-emphasised others. It is noteworthy that Shortell and colleagues’ (1994) ‘model’ did not depend on a metaphor. Rather, they adopted HSR conceptions of quality and a hypothesis testing approach, so although an explicit ‘model’ or metaphor can help in conceptual work related to evaluative research, it is not a necessary component of such research.

There are several issues which undermine the conception of ICU as an uncertainty reducing unit. First, uncertainty was found to be ‘functionally’ useful for the consultants in their dealings with nursing staff, whereby putative uncertainty was emphasised. Second, uncertainty, difficulty and variability are aspects of ICU work which are welcomed by the ICU staff. Likewise, the “lack of evidence” can be what makes intensive care work attractive: it is not a ‘problem’. As one informant told me, part of the attraction of ICU work is that it deals with problems which other hospital doctors have not addressed successfully.

That Consultants were intimately involved with, and retained control over, decision-



making also implies that ICU does not adopt a 'discretionary-type operating pattern'. Nurses had minimal discretion in treatment decisions, despite contributing to discussions about such issues.

There are ways in which ICU can be likened to safety critical organisations. But there are several ways in which the attempt to apply this normative model to intensive care is misplaced. There are important differences between this model, which has succeeded in airline travel and operating theatres, and how it might apply to ICU. On the one hand, features of ICU resemble safety-critical or highly reliable organisations. For example, there was informal communication between nurses on leaving the 'floor', and a 'double communication' path (two sets of patient notes, nursing and medical) could be seen as a failsafe mechanism, enhancing safety. On the other hand, the procedures or algorithms for airline travel or operating theatres are well-defined compared with ICU. As with airline travel, a surgical operation has a precise aim and well-defined end point (in HSR parlance there are well established processes and links between process and outcome). However, my analyses of medical and nursing work in ICU showed that detailed specification of procedures is not straightforward. Medical work in ICU requires continual interpretation of data, and protocols need to be overridden on occasions. While the importance of safety should not be underestimated, it seems strange to characterise ICU *fundamentally* as a safety critical organisation. Not wanting to understate the importance of safety, perhaps I ought only to criticise the way that the normative 'safety critical' approach has been operationalised by an unwarranted extension of an analogy with an aircraft cockpit. From the perspective of organisational and clinical practice, other directions for evaluative research are likely to be more productive in terms of identifying useful recommendations.

One appropriate model for ICU from management studies which my data would support, is a combination of 'Professional Bureaucracy' and 'Adhocracy' (Mintzberg 1983: 280-1). Features of ICU which resemble 'Professional Bureaucracy' are that the operating core is skilled and the key part of the organisation, that the middle line is controlled by professionals with much mutual adjustment, and that the environment is complex and (relatively) stable. Features of ICU which resemble 'Adhocracy' are that there are many liaison devices and significant flow of informal information and decision-making throughout the organisation, a sophisticated technical system, and power is controlled by 'experts'. Whether 'Adhocracy' or 'Professional Bureaucracy' is



more ‘appropriate’ depends on how the medical-nursing relationship is characterised. If they are seen as complementary professions, ICUs resemble a complex ‘Professional Bureaucracy’ (*complex* because there are two professions). If doctors are ‘experts’, with nurses forming a highly elaborated and educated support staff, ICUs resemble an ‘Adhocracy’. Summarising my data to the extreme, it would seem to be more appropriate to characterise the relationship as expert-support than professional-professional.

A more methodological point is this. While Reis Miranda and colleagues (1988: 82) commented that “the organizational nature of ICU is a combination of professional bureaucracy and adhocracy”, the data they collected was not related back to this ‘combination’. I would comment that the adoption of such a combination in evaluative research would appear, from my findings, to be empirically valid, and that greater rewards can be expected if conceptual effort is made to link concepts, theories and data.

My findings have also demonstrated the importance of considering ICU in terms of its location within the wider hospital. Along these lines, I would point out that ICU can be likened to a “central sorting office” (a description provided by one of my research participants); Strauss and colleagues’ (1997[1985]) ‘hospital as a collection of variegated workshops’ similarly captures both the relationship between clinical locales like ICU and the rest of the hospital as well as its craft-like internal working.

Comparing ICU to a central sorting office captures the way that the work is oriented to getting patients out of the ICU to an appropriate place, so that new patients can be admitted. This is key in explaining the organisational work which occurs. In short, in considering ICU organisational work, it is important to consider the way that ICU is fully embedded within the hospital: patients cannot be admitted directly to ICU from outside the hospital, except by transfer from another ICU (which is itself embedded in its hospital). This in turn should impact on how ICU is conceptualised – or modelled – as an organisation. None of the published evaluative studies have included this aspect of organisation in their research.

Speculatively, there are further implications concerning the perceptions of different medical specialities within ICU medicine. One difference between anaesthetists and physicians is that in their non-ICU duties anaesthetists would see (‘in theatre’) patients *before* their period in ICU, whereas physicians would tend to see (‘in clinic’) ICU



patients *after* their period in ICU. The consultant who described the ICU as a ‘central sorting office’ was a physician, and his description of the ICU as a central sorting office reflects his perspective on appropriate *post*-ICU care. It is important that HSR takes account of the different perspectives on health care from different practitioners.

I should also point out at this stage that there are several ways that my sampling strategy did not, of course, generate a statistically representative sample of ICUs. First, I asked to visit ICUs where I had met at least one person; it is possible that my meeting ICU practitioners is biased towards a certain kind of ICU practitioners. Second, there is an issue concerning the relative proportions of physicians and anaesthetists in my data. At the ICUs where I collected data the Consultants were divided roughly equally between physicians and anaesthetists. However, the best estimates of the proportion of ICU Consultants from each specialty suggest that anaesthetists outnumber physicians by nineteen to one<sup>1</sup>. If, as I have suggested, the ‘parent specialty’ is an important factor (at least in how relationships with the rest of the hospital are perceived), it would be interesting to look at ICUs where a clear majority of the Consultants are anaesthetists.

In summary, ‘models’ may be more or less useful for different purposes. The specific purpose of HSR is to improve the quality and/or efficiency of health services, but a ‘model’ for this purpose may not be necessary. If it is regarded as beneficial to have a model to represent a particular health service in evaluation and evaluative research, rather more empirical and conceptual work is required than seems to have been done to date. The purpose of a model and its appropriateness need to be specified, and conceptual work is required to operationalise the theoretical model so that the data to be collected can be linked to it.

### Assessing organisations

Many of the foregoing comments apply also to the issue of assessing organisations, where not only is empirical and conceptual work required, but also considerable political work to build a consensus about the appropriate dimensions of assessment. An additional factor regarding the organisational situation of the ICU in the hospital, which my findings demonstrated, is that despite the ‘closed’ ICU and its firm organisational

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<sup>1</sup> R. Kishen, personal communication, 22 September 2003, based on ICS Manpower Database.



boundaries there is considerable ‘distributed decision-making’ amongst consultants. That is, when ICU consultants are faced with difficult treatment decisions, or issues they could not resolve, they often discussed the problems with consultants from other specialties. Such collegial decision-making renders the concept of ‘assessing’ ICUs problematic, at least in so far as they might be treated as entities which are wholly distinct from other hospital care. So long as assessment at the level of ‘organisational unit’ continues, I am providing an additional reason to continue what has become standard practice in HSR: the ‘assessment’ of ICUs in terms of hospital outcome (adjusted for case-mix) rather than ICU outcome. The reasons for this are usually given in terms of ICU decisions regarding admission or discharge criteria, which could affect the overall (case-mix adjusted) mortality rates. I support the assessment in terms of hospital outcome because the ICU is embedded within the hospital: the existence of collegial distributed decision-making emphasises the way that ICUs are part of the hospital and should be assessed in these terms. In addition, the direction of evaluative research on ICUs needs to account for their sometimes ‘porous’ boundaries.

My discussion in chapter one also revealed some theoretical problems with ‘assessment’. For while patient outcome, adjusted for case mix, might be an appropriate measure at the level of groups of patients, it is not clear that in aggregate it remains a sensitive measure of organisational performance. One reason for this is that its measurement ignores other dimensions of health care quality (for example, humanity and equity) and efficiency: an effective but otherwise inefficient ICU could have a negative impact on hospital-wide effectiveness. In an “era of assessment and accountability” (Black 1997: 1836) comparison of organisational performance is likely to continue apace. However, the development of appropriate measures of organisational performance, while probably including case mix adjusted mortality as a component, still requires conceptual development to accompany the ever-increasing volume of quantitative data which is being produced. Qualitative and ethnographic research such as presented in this thesis can make a small but significant contribution to such development.



## Contribution to medical sociology

In this section I draw specific implications from my empirical findings for medical sociology. I have contributed to several areas of debate within medical sociology: the role of uncertainty in clinical practice; the character of medical work; the contribution of nursing to acute care; and inter-professional and inter-organisational relations. I now restate each of these contributions and highlight their connections to current thinking in medical sociology.

In chapter five I considered the broad and recurring theme of medical uncertainty. In my analysis I did not assume that uncertainty was “endemic” (Harvey 1996: 85) or “pervasive” (Zussman 1992: 117) in medical practice in the ICU. Rather, I analysed my data on responses to two broad conceptions of medical uncertainty: uncertainty in the ‘knowledge base’ of medicine and uncertainty related to medical treatment. Uncertainty in the knowledge base, whether of medical knowledge as a whole or at an individual level, was found not to be a ‘problem’ for ICU practitioners. Indeed, on several occasions, junior ICU staff seemed to be certain about a situation, but turned out to be wrong in their certainty. My findings support Atkinson’s critique of R. Fox’s conceptions of medical uncertainty: that practitioners of training grades, for example, are not plagued by ‘radical doubts’. The routine and extended presence of Consultants on ICU may constitute a partial explanation for this finding: junior doctors, for example, do not have responsibility for decision-making in serious situations, thereby the salience of their ‘being uncertain’ is lessened. Consultants, too, were pragmatic where knowledge or treatment was ‘uncertain’ or problematic.

Regarding uncertainty in treatment, I established that there is a band of what is regarded as appropriate medical knowledge. Knowledge outside of this band is either deemed too difficult or complex for ICU medical staff to address, or is codified for non-medical staff to deal with. In the case of complex issues, medical experts from elsewhere in the hospital may be called upon to provide advice or assistance, which tended to involve fairly detailed discussions. Although the difficulties were not always resolved by obtaining such advice, this activity demonstrates how medical practice can be distributed among different specialties, and a solely cognitive approach to analysing medical decision-making is not sufficient. In the case of codified knowledge, a range of health professionals implemented care and treatment regimes, but tended to have less



interpretive discretion than doctors. This was seen most explicitly in the contribution of pharmacists to discussions at ward rounds, which tended to be perfunctory, technical and bureaucratic, in contrast to discussions between consultants from different medical specialties. In clinical practice in the ICU, protocols were a convenient short-hand for particular procedures and treatments.

There are differences between my findings on protocols and Berg's (1997a, 1997b, 1998) extensive analyses of protocols in medical work. Berg identified that the introduction of protocols into clinical work can change the shape of its existing practice, and can introduce new complexities. Furthermore (although this was an argument in the slightly different context of decision-making tools), he argued that specification of medical work can rarely apply universally, but has to be enacted for each individual patient (Timmermans and Berg 1997).

My arguments do not directly contradict Berg's. One interpretation of the differences is that I have perhaps taken a perspective which emphasises stability rather than change. But it is more to the point that where I encountered protocols in ICU, they were already well established in routine practice. I am not arguing that the protocols which have been introduced to ICU replicated previous clinical practice. Indeed, some of my evidence does support the notion that protocols have to be enacted for each patient situation (for example, consultants stated that they would override protocols in certain situations). However, it is important to note that protocols *can* become routinely established in clinical practice. Some protocols were so well established in ICU that from observation I barely recognised that they were referred to, and thought that there were far fewer than was actually the case. It was only in interviews that nurses and doctors mentioned protocols and assured me that they *were* routinely referred to and used. Berg's research question – can medical practice be specified as a protocol? – therefore analysed changes to practice as protocols are introduced. I asked a different question – of what does practice consist? – and identified a different role for protocols. The difference in research question and findings is indicative of what I consider to be some shortcomings in the Latourian approach espoused by Berg, to which I return presently.

In chapter six I sought an adequate characterisation of medical work in ICU and argued that it is particularly *craft-like* in form. I moved the sociological conceptions of 'craft'



forward by specifying dimensions of the term craft, and I argued that medical work in ICU is craft-like in two main ways. First, the knowledge that is used is *applied* to particular problems and medical practice (following Freidson 1988[1970]) is not strictly scientific nor scholarly. Second, the work is *material* (dealing with machines and human bodies) and *embodied* (dextrous manual skills are learnt and utilised). The argument that medical work is craft-like was an attempt to resolve the unsatisfactory dualism represented by the commonplace question “is medicine a science or an art?”

In analysing knowledge-in-practice I moved from the absence of knowledge (indicated by ‘uncertainty’, as analysed in chapter five), to its presence, considering how ‘evidence’ was used and interpreted. This started with a criticism of the ‘is medicine a science?’ component of the unsatisfactory dualism, and moved on to question the notion of medicine as an art. I presented the case that the way evidence was used and interpreted was neither scientific (producing knowledge), nor artistic (creative). But neither could medical work be seen as technical, since interpretation and re-interpretation were vital components of the reasoning I observed. Furthermore, relating to the argument in chapter five, the ‘knowledge base’ was not important of itself. As in many craft trades, there are problems at hand which need to be resolved: these are not scholarly problems but practical problems requiring practical solutions.

The metaphor of craft had an additional relevance to ICU medical work, which is that traditional craft trades work with the material world. Aspects of medical work in ICU which resonated with this aspect of craft work were the need for embodied skills (learnt in apprenticeship fashion), dealing with and using technical equipment and tools, and altering, repairing or improving some aspect of the material world. Whereas with a craft trade such as plumbing this might involve repairing a burst pipe or installing a bathroom, in medical work the ‘materials’ which are ‘repaired’ are a human body. Notably, the material technologies in ICU seemed quite ‘unstable’, but their failings could be routinely integrated into clinical practice. In this sense, technological artefacts were routinely *glass-boxed*<sup>2</sup>. That is, their functions were completely known, and; if necessary, replaced by embodied, human skills.

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<sup>2</sup> ‘Glass-box’, in deliberate opposition to ‘black-box’, is a term derived from software testing (and with a similar origin in engineering). Whereas ‘black-box testing’ is based on the function and performance of a unit (with no explicit knowledge of its internal structure), glass-box testing is based on knowledge of the internal structure (Fairley 1985: 284).



The metaphor of craft breaks down to some extent when we consider that craft seems to imply the application of *well-known* knowledge (of which the craftsman may have only a rudimentary understanding), whereas there was evidence from my data that the ‘knowledge base’ of medicine was by no means ‘complete’. Overall, though, I argued that the metaphor of ‘craft’ is more appropriate than earlier metaphors and conceptualisations and thereby furthers our understanding of medical work.

Much of the data I presented in relation to the materiality of ICU medical work could have been analysed in terms of radical social theory (e.g. Latour 1993[1991]). I consider this in more detail in the next section of this chapter, but for now, I would like to make a brief comment on the traditional biomedical construction of the body, which seems to be undermined by ICU work. For purposes of learning and in the traditional organisation of health care services according to medical specialties, biomedicine constructs the human body *systemically*: medical specialists acquire detailed knowledge about bodily organs or areas. However, in what is arguably the most technologically advanced area of health care, this construction of the body by biomedicine is by-passed. ICU practitioners seem to regard their work as whole body, applied, acute physiology, thereby treating patients *holistically* rather than *systemically*.

Such a holistic view of the body calls to mind the nursing construction of its work, which I analysed in chapter seven. In attempting to relate my data to prevailing nursing theories, I found that the latter have not adequately explicated ICU nursing. Whether focusing on a care-cure distinction, or adopting an ideology of nursing’s intrinsic therapeutic value, nursing theories appeared to have neglected a vital component of ICU nursing: the care and reassurance nurses provide to the relatives of patients in intensive care. In addition, the technical knowledge ICU nurses explicitly referred to was predominantly ‘biomedical’ in character.

I therefore argued that a fundamental difference between medicine and nursing, articulated in some of the nursing literature, had been overstated (at least for the case of ICU). The evidence I presented indicated that nurses and doctors share an overwhelmingly similar perspective of their practice, and differences between the two professions, on careful analysis, can be seen to be fairly superficial. Specifically, nurses and doctors both rely on and interpret biomedical data, they both need to learn to use medical technology, and they both engage in the care of relatives. There are, though,



differences in emphasis on each of these areas for the two professions, with doctors needing greater skills of interpretation (of biomedical data) and nurses taking first responsibility for the care of patients' relatives.

A further similarity between nurses and junior doctors on ICU is that both seem to regard ICU work as an opportunity for learning and self-development. ICU nurses in the UK regard ICU as somewhere to learn about acute physiology, as do the junior doctors. Thus while for junior doctors their work is officially 'learning on the job', ICU nurses talked about 'liking the technical side'. This implies that learning about medical technology and acute physiology is what ICU nurses are good at, enjoy, and want to do. This 'technical side', incidentally, is what makes ICU nurses regarded (by other nurses, if not themselves) as an 'elite'. Being so technically skilled, and with 'obvious' serious conditions to continually monitor, is perhaps why ICU nurses do not normally have to appear to be busy (for example, rushing around on errands). This in turn could partly explain why the ICU appears calm and sedate.

While stating that medicine and nursing in ICU share a similar perspective, I did not argue that the perspectives are identical, and there remain significant power differentials between the two groups. Medical discourse can render nursing work invisible. One example is the paradoxical medical decision to "do nothing": while the doctors say 'do nothing', much of the nursing (and indeed, technological) labour continues. Thus there is an implied medical dominance: doctors make important decisions which nurses act upon. Overall, though, I suggested that the shared perspective of ICU nursing and medicine can be explained by the way that the ICUs I visited have firm physical boundaries, and the (senior) medical and nursing staff tend to be both unchanging and co-located. Thus doctors and nurses work together for extended periods of time.

This theme was taken further in chapter eight, where I examined the routine enactment of organisation in ICU work and the talk about its organisation. I showed that as well as a firm physical boundary to ICU there is an ongoing social accomplishment of ICU as a distinct entity. This accomplishment portrays ICU as distinctive, separate from, and in some ways better than, other acute care. In this way, ICU as a joint medical-nursing 'project' is formulated and enacted. This can be illustrated at two levels. At one level nurses and doctors work together on specific projects, two examples being the setting up of 'ICU follow-up clinics' and 'critical care outreach teams'. More fundamentally,



the enthusiasm for the specific project of ‘critical care outreach teams’ both reflects and reinforces the viewpoint of ICU staff concerning hospital wards: they are ‘chaotic’; the staff there lack basic clinical skills; and patients there may need ‘rescuing’ from poor quality care. Such a joint ICU project is linked to the close routine working between doctors and nurses, where discussions are held between members of the two groups in a more open and less hierarchical manner than the traditional conception of a ‘doctor-nurse game’ (Stein 1967). I also found ‘functional uncertainty’, previously identified in doctors’ dealings with patients’ relatives (Davis 1960, Harvey 1992, 1996), in the context of inter-professional interactions. Consultants, in their dealings with nurses, sometimes emphasised ‘uncertainty’, which had the effect of facilitating discussions between doctors and nurses, although at other times and in discussion with other groups doctors de-emphasised uncertainty.

There are organisational and theoretical consequences of the close inter-professional relationship between doctors and nurses. Organisationally, it is paradoxical that ICU doctors rely on a trusted group of nurses but, in placing less emphasis on the difference between doctors and nurses, they retain their clinical autonomy and decision-making power in regard to other medical specialties and hospital administrators. Theoretically, the strategies for ‘professional domination’, as articulated by B. Turner (1995), need to be adapted for this instance of micro-level professional domination. It is difficult to fit intensive care nursing into Turner’s schema for ‘medical domination’, which included the strategies of exclusion, limitation and subordination. Rather, professional domination of nursing by medicine in ICU seems to work by a more subtle process of *incorporation*.

### **Alternative directions for sociological research on intensive care**

I now want to highlight two alternative directions for sociological research on ICU. The first could fulfil a critical dimension of sociological inquiry, and deal more specifically with the interactions between ICU caregivers and patients’ relatives. The second could pursue an ontologically radical, anti-essentialist agenda, deliberately construing the boundaries between the natural and the social as blurred. I consider these in the light of my findings and experience of research on ICU.



## Critical research on relatives' rights

The data I collected was concentrated on interactions between caregivers rather than interactions between caregivers and patients' relatives, so I cannot properly comment on Harvey's (1992, 1996) argument, that technology in the ICU 'masks' uncertainty and contributes to medical dominance over patients and their relatives. However I do want to comment on the role of patients' relatives which is related to the issue of doctors' legal authority.

The patient role in ICU is minimised: patients are very often sedated and therefore, as I showed in chapter seven, a crucial interaction becomes that between ICU staff (particularly nurses) and patients' relatives. Rier (2000: 88), in observing his own period as a patient in ICU, commented that the ICU is a context

in which physicians' traditional paternalism makes the most sense: when patients are at their weakest and least stable, and their lives hang in the balance.

Whereas in other areas of health care, patients themselves may be able to negotiate and, in a sense, make inroads into medical authority, in the ICU they are rendered unable to do this. This comes most clearly into focus when the possible withdrawal of treatment is being considered.

According to some nursing theories, nurses should be able to act as 'patient advocates'. But, given that I have argued that ICU nursing is implicated in the 'ICU project', it is doubtful that nurses possess the neutrality necessary to perform this role adequately. Patients' relatives might seem to be a viable alternative but, as I was informed during the course of my research, the legal rights of patients' relatives are tightly circumscribed:

At present in England, Wales and Northern Ireland no other individual has the power to give or withhold consent for the treatment of an adult who lacks decision making capacity but treatment may be provided, without consent, if it is considered by the clinician in charge of the patient's care to be necessary and in the best interests of the patient (British Medical Association 2001: 27)

As indicated by its absence from the list of countries at the beginning of the above quotation, the situation is slightly different in Scotland, where a proxy decision-maker may be appointed for a mentally incapacitated adult. There are moves afoot to bring the rest of the UK in line with the Scottish position, and in my view the current situation in England, Wales and Northern Ireland is an ethical and legal failing. The British



Medical Association (2001) may recommend consulting those ‘close to the patient’, but the terms in which this is put barely disguise a ‘doctor knows best’ mentality:

Even where their views have no legal status in terms of actual decision making, those close to the patient may have a right to be consulted. In any event it is clear that they can provide important information to help ascertain whether the patient would have considered life-prolonging treatment to be beneficial.  
(*ibid.*: 54)

Two quite different types of expertise are conflated here: expertise in medical treatment and expertise on patients’ wishes. It seems to me to be entirely appropriate to say that ICU doctors (and nurses) can be considered as ‘experts’ on treatment and care in extremely serious situations. However, patients are the ‘experts’ on their own lives and the values by which they wish to live or die. With the patient incapacitated, the next best ‘experts’ are surely those who know the patient best. An important and useful research project could inform legal and ethical debates and, perhaps, help to rectify the situation where those close to the patient have no legal status.

#### Cyborgs, hybrids, actants and heterogeneous engineers

As I described in chapter four, on first entering an ICU, the materiality of the environment is striking. ICU patients are *asocial bodies* rather than *social patients*. There is equipment to support and monitor almost every kind of physiological functioning; food and drink is passed in and out of the body through machinery, and is recorded carefully; and treatments can necessitate being hooked up to a ventilator, tubes delivering drugs or other machinery. Analysing such an environment in a post-humanist, anti-essentialist mode, adopting such metaphors as cyborgs (Haraway 1991, Stelarc 2000, Farnell 2000), hybrids, actants or heterogeneous engineers (Latour 1987, 1993[1991], 1999b, Law 1992) is superficially attractive.

A starting point for these kinds of analysis would be the data which I used to develop the metaphor of craft. Most interestingly, the body’s boundary seems to be changed by treatment in intensive care: one could argue that the ventilators by a patient’s bedside have become the lungs; that the arterial line taking blood out of the body in order to obtain blood gas readings has become an artery; that a dialysis machine has become the kidney. Likewise, there is invasive and almost total monitoring of the human body, such that its functions, even where not *replaced* by technology, are *represented* by it.



This could fit with an ontologically radical conception of cyborgs (Haraway 1991, Stelarc 2000, Farnell 2000).

On a personal note, though, I would express the reservation that I have a sense of queasiness about analysing health care in such post-humanist terms. Haraway's (1991) strident text, for example, seems to impose a moral perspective, whereas I would prefer to try to understand the moral perspectives of the human persons at any particular site of analysis. The perspective of participants involved in giving health care is something which I wanted to represent fairly, as I discuss in the concluding section of this thesis. Notwithstanding this personal preference, though, a more general point is that these kinds of 'exciting' and attractive social theories require disciplined empirical testing. In any event, I did not consider such an approach appropriate for this thesis, since from the outset I was more explicitly concerned with work and its organisation.

Another approach, similar in the sense that it deliberately blurs boundaries between the technological, social and natural, is Actor-Network Theory (ANT), with which there has been an implied debate throughout this thesis. In the rest of this section I consider the appropriateness of three ANT metaphors - hybrids, actants and heterogeneous engineers - before concluding the thesis by reflecting on the major disjuncture between my thesis and ANT.

In an ANT approach, entities are considered neither as essentially natural nor essentially social, but rather as hybrids. In one sense this is what I found in ICU: it is difficult to say that ultimately the 'natural' or the 'social' is privileged. A telling example was the way that '[the patient] can usually get to bingo' was passed around the hospital as a clinically relevant fact: a notionally 'social' piece of information sums up the clinical situation. However, adopting the principle of parsimony, I do not need to adopt an anti-modern or post-humanist stance to note and make analytical use of this kind of comment. Such profound philosophical viewpoints, although interesting in terms of "reflection on modernity and post-, hyper-, pre and anti-modernity" (Latour 1999a: 21) would, as in the case of 'cyborgs', be at odds with the perspective of participants.

As I mentioned in chapter three, part of the reason why ANT is difficult to apply to medical practice is that the work is not constructing knowledge. Thus, Latour's (1999b: 303) definition of *actants* included the following statement:



science studies focuses on the complex and controversial nature of what it is for an actor [human or non-human] to come into existence.

The problem I had was that in trying to faithfully represent *practice*, I did not witness actants 'coming into existence': actants' existences were generally already established and stabilised. The possible exception to this is my analyses of what happened when machines 'malfunction' (pages 162-8). But still, it was the creative response by humans to the non-humans' malfunctions, rather than any kind of agency on the machines' part, which was apparent.

There is no doubt that ANT can provide a useful analytical framework where actants (technological or scientific) are coming into existence, as in a sociological critique of health technology assessment (HTA) (*e.g.* Faulkner 1997, May and Ellis 2001). The purpose of HTA, as the purpose of science, might be termed the creation of 'facts' and it is ripe for an ANT-style analysis. However, the purpose of clinical practice is the restoration of health, and the particular purpose of clinical practice in ICU is recovery from an acute phase of illness. Here, ANT is less useful.

Another ANT metaphor, that of 'heterogeneous engineering' (Law 1992), could also be seen to apply to ICU practitioners very well: they fashion tools, work dextrously and pull varied bits of knowledge together to accomplish their work. However, were this to be applied to ICU, the power and radical nature of the ANT metaphor would be lost, since in this sense heterogeneous engineering is quite ordinary (manipulating varied materials), and is not being used in the adventurous ANT sense of creating things or knowledge.

My criticism of ANT so far is that for the sake of parsimony I have not needed to draw on its metaphors. I am not arguing that ANT is wholly 'wrong' – for example, my findings that technological artefacts seemed to be routinely 'glass-boxed' in ICU supports some of ANT's conceptions of technology. I do not dispute that ANT has been successfully used in analysing the production of knowledge and *particular and specific* technologies in practice. However, these approaches have not attempted to grapple with the 'whole' of a technological environment. In sum, I do not think that using ANT would have added analytical value to trying to explain medical practice, even a highly technological one such as intensive care. The weakness of ANT is perhaps that it emphasises innovation rather than the 'routine' (although it is a moot



point, of course, whether either routine stability or change is more important to analyse). But my more fundamental issue with ANT is that in ascribing agency to non-human actants it can de-emphasise human agency. And human agency is crucial in explicating practice, as I discuss in the concluding section of this chapter and thesis.

### **Conclusion: theorising the practice of high technology medicine**

A unifying theme of my thesis is that there is an underlying practical action orientation to clinical work. There is, to paraphrase Latour (1999a: 22), a ‘rather repressed but very present teleology’ in health care work. The ‘very present’ *purpose* of the work of ICU doctors and nurses, which is repressed by social theories which do not account for human actors’ purposes, is to enable patients to recover from an acute phase of illness. The analysis I have presented has demonstrated the complexities of attempting to fulfil this purpose. It is precisely as we consider ‘purposes’, however, that a disjuncture with ANT is most clearly manifested. In attempting to account for the purpose of clinical practice I was led away from ANT despite the highly technological and knowledge-infused nature of the work.

The purposes of any social group are an important component of that group’s own theory of their practice. It seems to me to be important to account for participants’ own theories of practice. On this issue, Latour’s (1999a: 19-20) prelude to a comment on the shortcomings of ANT is noteworthy:

ANT was simply another way of being faithful to the insights of ethnomethodology: actors know what they do and we have to learn from them not only what they do, but how and why they do it. It is *us*, the social scientists, who lack knowledge of what they do, and not *they* who are missing the explanation of why they are unwittingly mitigated by forces exterior to themselves and known to the social scientist’s powerful gaze and methods.

In following the spirit of these comments, I sought to learn from ICU participants ‘what they do [and] how and why they do it’. This led me to consider their purposes, and this empirical observation precluded an ANT approach, since I logically thereby privileged human ‘actants’ over non-human ones. The point is, that for understanding the routine practice of ICU (and by extension, health care practice generally), the symmetrical approach of ANT becomes a weakness. The “analytical stance” (Law 1992: 383) of ANT is to analyse the material and the social in the same terms. I acknowledge that this



has been productive in analysing entities coming into existence, but in terms of their routine functioning there is a problem: it is rather difficult to learn from non-human actors *their* theory of practice. Where entities are already in existence, it is possible, one might even say necessary for certain analytical purposes, to treat them as ‘givens’.

In contrast to non-human actants, intensive care doctors and nurses have their own, sometimes implicit, theories of practice, which I needed to take account of in my theory of their practice. In general terms, this was the achievement of my empirical chapters, where I undertook analysis of the work in ICUs in relation to ‘theoretical’ representations of the practice of medical and nursing work and in relation to practitioner’s own representations. I took account of, but did not privilege nor take for granted, participants’ comments which were indicative of their own theories of practice. For example, through observation I was able to provide a more nuanced explanation for ‘uncertainty’ than participants’ own comments. But also through observation I was able to provide empirical support for the *emic* description of the ICU as a ‘central sorting office’. In briefest summary, a theory of practice for ICU practitioners is that ICU medical work is particularly craft-like; that ICU medicine and ICU nursing adopt and share a holistic but biomedical view of the body; that ICU nursing additionally prioritises caring for relatives; and that the two occupations are engaged in a mutually beneficial ‘project’. Where practice theory has been particularly useful is in its profoundly social conception of the object of analysis. It is both anti-individualist (Barnes 2001) and humanist (Schatzki 2001), although it attempts to take account of materiality and embodiment. My analysis has supported these aspects of the theoretical perspective, having both demonstrated the ways that individuals relate and orientate to one another in their clinical practice, and indicated how it can be necessary not to ascribe agency to non-human actants.

My specific findings about ICU work have general relevance. As I noted at the beginning of chapter one, ICU has a high profile and is regarded as indicative of the state of health care in general. There is the question of the appropriateness of ICU being such a motif for the NHS, and my research has provided a more measured view of the day to day routines of intensive care than a journalistic or television drama account. In this, and in proposing more subtle explanations concerning ‘organisational effectiveness’ than appear in the medical literature, the usefulness of ethnography has been demonstrated.



My arguments could apply to other areas of health care (this would be the case whether or not ICU is a 'motif' for health care). Since my analytical themes were developed with reference to the state of sociological knowledge on a range of theories and concepts, it is right that I can expect future sociological work to criticise, develop or reinterpret my own. I offer a few examples of how this might be taken forward. First, with regards to uncertainty and knowledge, we need to consider how different locales of health care utilise their knowledge and distribute their knowledge among a range of health care professionals. Second, I have argued that ICU medicine is craft-like, which raises the question of the appropriateness of this metaphor for other specialties: perhaps other metaphors might more usefully aid our understanding of medical work in other contexts. Third, I found that nursing theory has missed important aspects of ICU work, and it is plausible that nursing theory is similarly flawed in other contexts. Fourth, I identified an 'alliance' between what might be regarded as competing occupations, which raises the question of how different professions relate to one another 'on the ground' of health care work. Finally, I have commented on an underlying purposive logic to health care work. This is an aspect of social practices which can be neglected in theories of the social, and needs to be, at the very least, accounted for in sociological analysis.



## Appendix One

### Organisational factors and patient outcome following intensive care

The paper presented in this appendix was published in August 2001 in *Current Opinion in Critical Care*, volume 7 (issue 4), pages 284-96. I am grateful to Kathy Rowan for collaborating on this paper. Permission to reproduce the paper is being sought.



# Variation in intensive care unit outcomes: a search for the evidence on organizational factors

Simon Carmel, MSc,\* and Kathy Rowan, DPhil<sup>†</sup>

This study was undertaken to determine the extent of empirical evidence on the role of organizational factors in the critical care literature and to categorize these factors. Studies evaluating organizational factors were identified through electronic and hand searching of the critical care literature. Sixty-three publications relating to 54 different studies were identified. The studies were grouped into eight main categories: staffing, teamwork, volume and pressure of work, protocols, admission to intensive care, technology, structure, and error. Studies evaluating organizational factors exist in the critical care literature, and there is evidence that the number is increasing each year. Results indicate that organizational factors may have an impact on mortality after case mix adjustment. Some areas have been investigated more thoroughly than others and are ripe for systematic review. Variation in case mix adjusted hospital mortality after intensive care is an old theme. This study has shown that emerging data will help us understand mortality differences and deliver better outcomes for patients. *Curr Opin Crit Care* 2001, 7:284–296 © 2001

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## Abbreviations

APACHE II	Acute Physiology and Chronic Health Evaluation
APACHE III	Acute Physiology, Age, Chronic Health Evaluation
ICU	intensive care unit
MPM <sub>0</sub>	Mortality Probability Model (admission)
PSI	Pediatric Severity Index
PRISM	Pediatric Risk of Mortality
SAPS II	Simplified Acute Physiology Score

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Hospital mortality after intensive care is high. Recent data pooled from England, Wales, and Northern Ireland indicate that overall hospital mortality after adult intensive care is 30.8% [1] and ranges from 17.7 to 48.7% across hospitals [2]. Clearly, case mix (age, acute severity, comorbidity, surgical status, reason for admission) is responsible for some of this variation. Case mix adjustment is highly sophisticated in adult intensive care, with second and third generation methods demonstrating high levels of accuracy [3–6]. However, after adjusting for the characteristics or case mix of admissions using these sophisticated methods, considerable variation in hospital mortality remains [7–9]. Recent data pooled from England and Wales indicate that there is wide variation in the organization and delivery of intensive care [10], making it important to understand the impact of organizational factors on case mix adjusted hospital mortality after intensive care.

Despite this data, much of the focus of research undertaken to explain the residual variation in hospital mortality after intensive care has been directed at evaluating specific therapeutic interventions. However, more recently, attention has shifted toward service delivery and organization of care, with research directed toward evaluating the factors involved in the way care is delivered and organized rather than the components of the care delivered.

Given the shift toward research evaluating the role of organizational factors and the notion that such factors may be responsible for some of the residual variation in hospital mortality after adjustment for case mix, this study was undertaken primarily to determine the extent of empirical evidence published on the role of organizational factors in the critical care literature. A secondary objective was to categorize the retrieved literature to provide a framework for future synthesis and systematic reviews in this area.

This article describes and summarizes the retrieved evidence evaluating the role and potential impact of organizational factors on mortality after intensive care.

## Methods

Studies evaluating organizational factors were identified through electronic and hand searching of the critical care literature.



**Table 1. Staffing: management and personnel**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Kern and Kox [21] (1999) <sup>¶</sup>	1	1,526	Consecutive admissions Cardiothoracic ICU Germany	Standardized (treatment, discharge, ward round, medical cover, staff management/ personnel protocols) versus nonstandardized procedures (I)	Hospital mortality (adjusted- APACHE II)	Improved outcome with standardized procedures
Reis Miranda <i>et al.</i> , eds. [22•] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe**	Level of EOF <sup>†</sup> (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	Improved outcome associated with higher levels of EOF
Reis Miranda <i>et al.</i> , eds. [22•] (1998) <sup>§</sup> , Schaufeli and Le Blanc [23] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe**	Level of nurse burnout (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	No association
Reis Miranda <i>et al.</i> , eds. [22•] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe**	Level of perceived job security (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	No association
Reis Miranda <i>et al.</i> , eds. [22•] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe**	Employee-centered versus job-centered culture (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	No association
Shortell <i>et al.</i> [24••] (1994) <sup>§</sup>	42	17,440	Consecutive admissions ICUs USA	Level of nursing staff turnover (M)	Hospital mortality (adjusted- APACHE III)	No association
Shortell <i>et al.</i> [24••] (1994), Zimmerman <i>et al.</i> [25] (1991) <sup>§</sup>	42	17,440	Consecutive admissions ICUs USA	Level of caregiver interaction <sup>‡</sup> (M)	Hospital mortality (adjusted- APACHE III)	No association

\*Not all ICUs were included in all analyses. <sup>†</sup>EOF, Elementary Organizational Framework: composite measure encompassing written job descriptions, regular staff meetings about both clinical and nonclinical issues, existence of formally written protocols to guide care activities, and regular evaluation of staff. <sup>‡</sup>Composite measure encompassing culture, leadership, coordination, communication, and conflict management abilities. <sup>§</sup>Cohort (admissions) and survey. <sup>¶</sup>Before-after study. \*\*12 countries. I, intervention; M, measurement.

Electronic searching was undertaken of two National Library of Medicine bibliographic databases (MEDLINE, 1966 to January 2000; HealthSTAR, 1966 to July 2000), one Institute for Scientific Information Inc. bibliographic database (Social Sciences Citation Index, 1981 to December 2000), and the in-house critical care reference database accumulated over 15 years at the Intensive Care National Audit & Research Center.

National Library of Medicine databases were searched under the Medical Subject Headings (MeSH) subjects "intensive care" and "intensive care units" (unexploded) with the National Library of Medicine subheadings "organization and administration" and "manpower." The Social Sciences Citation Index and the Intensive Care National Audit & Research Center in-house database were searched using the text-based search strategy (["ICU" or "intensive care"] and ["study" or "investigation" or "inquiry" or "research"]) according to Mays *et al.* [11].

Hand searching of the two major intensive care journals, *Critical Care Medicine* and *Intensive Care Medicine*, was undertaken for the years 1996 to 2000. In addition,

published conference abstracts were hand searched for the Society for Critical Care Medicine and the European Society of Intensive Care Medicine for 1996 to 2000. A number of other conference abstracts were hand searched opportunistically (the 7<sup>th</sup> World Congress of Intensive and Critical Care Medicine, Ottawa, 1997; the 20<sup>th</sup> International Symposium on Intensive Care and Emergency Medicine, Brussels, 2000; and the 25<sup>th</sup> Australian and New Zealand Annual Scientific Meeting on Intensive Care, Canberra, 2000).

Titles and abstracts of articles were retrieved and reviewed to determine eligibility according to the following inclusion criteria:

- (1) Studies in one or more intensive care units (ICUs)
- (2) Studies in adult and pediatric general and specialist (not mental or psychiatric) ICUs
- (3) Studies evaluating the impact of local ICU and hospital organizational factors on mortality
- (4) Studies published in English

Based on examination of included articles, a categorical scheme was developed. The categories were empirically



**Table 2. Staffing: intensivist-led**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Tenner <i>et al.</i> [26] (1999) <sup>†</sup>	1	NS	Consecutive admissions Pediatric ICU USA	Pediatric hospitalists vs pediatric residents out-of-hours cover (I)	Unit mortality (adjusted—no formal method)	Improved outcome with pediatric hospitalists
Hanson <i>et al.</i> [27] (1999) <sup>‡</sup>	1	200	Admissions, randomly selected Surgical ICU USA	On-site intensivist-led team vs multiple-site surgeon-led team (I)	Hospital mortality (crude)	No difference
Pronovost <i>et al.</i> [28] (1999) <sup>‡</sup>	39	2,987	Admissions with abdominal aortic aneurysm ICUs USA	Daily ward rounds by intensivist vs no daily ward rounds by intensivist (M)	Hospital mortality (adjusted—no formal method)	Threefold decrease associated with daily ward rounds by intensivist
Bach <i>et al.</i> [29] (1998) <sup>§</sup>	1	118	Admissions with prolonged critical illness ICU USA	University vs nonuniversity based intensivist teams (I)	Hospital and one-year mortality (crude)	No difference
Multz <i>et al.</i> [30] (1998) <sup>§</sup>	2	280	Consecutive admissions Medical ICU USA	Open vs closed (ICU-led) (I)	Hospital mortality (adjusted—MPM <sub>0</sub> )	Improved outcome with closed unit
Ghorra <i>et al.</i> [31] (1999) <sup>†</sup>	1	274	Consecutive admissions Surgical ICU USA	Open vs closed (ICU-led) (I)	Unit mortality (crude)	Improved outcome with closed unit
Tai <i>et al.</i> [32] (1998), Eng <i>et al.</i> [33] (1998) <sup>†</sup>	1	239	Consecutive admissions Medical ICU Singapore	Open vs closed (ICU-led) (I)	Unit mortality (crude)	No difference
Marini <i>et al.</i> [34] (1995) <sup>†</sup>	1	292	Consecutive admissions Surgical ICU USA	Full-time surgical intensivists vs general consultants (I)	Mortality, when measured not stated (crude)	Improved outcome with closed unit
Carson <i>et al.</i> [35] (1996) <sup>†</sup>	1	245	Consecutive admissions Medical ICU	Open with intensivist consult vs closed (I)	Hospital mortality (adjusted— APACHE II)	Improved outcome with closed unit
Pollack <i>et al.</i> [36] (1994) <sup>‡</sup>	16	5,415	Consecutive admissions Pediatric ICUs (randomly selected) USA	Pediatric intensivist vs no pediatric intensivist (M)	Unit mortality (adjusted—PRISM)	Improved outcome associated with pediatric intensivist
Rowan [37] (1992) <sup>‡</sup>	26	10,806	Consecutive admissions ICUs UK and Ireland	Open vs closed (ICU-led) (M)	Hospital mortality (adjusted— APACHE II)	Improved outcome associated with closed unit
Brown and Sullivan [38] (1989) <sup>†</sup>	1	439	Consecutive admissions ICU USA	Intensivist vs no intensivist (I)	Unit and hospital mortality (crude)	Improved outcome with intensivist
Pollack <i>et al.</i> [39] (1988) <sup>†</sup>	1	262	Consecutive admissions Pediatric ICU USA	Pediatric intensivist vs no pediatric intensivist (I)	Unit mortality (adjusted—PSI)	Improved outcome associated with pediatric intensivist
Hainer and Lawles [40] (1988) <sup>§</sup>	2*	523	Consecutive admissions Medical and cardiac ICUs USA	Family physicians vs general internists (M)	Mortality (measured at 19 months on average) (crude)	No association
Reynolds <i>et al.</i> [41] (1988) <sup>†</sup>	1	212	Admissions with septic shock Medical ICU USA	Intensivist vs nonintensivist (I)	Hospital mortality (adjusted— APACHE II)	Improved outcome with intensivist
Li <i>et al.</i> [42] (1984) <sup>†</sup>	1	954	Consecutive admissions ICU USA	Open vs closed (ICU-led) (I)	ICU, hospital, and one year mortality (adjusted—no formal method)	Improved outcome with closed unit
Teres <i>et al.</i> [43] (1983) <sup>‡</sup>	2	558	Consecutive admissions ICUs USA	Intensivist-led on-site resident team vs private physicians (M)	Unit mortality (crude)	No difference; improved outcome associated with resident team for shock patients ( <i>post hoc</i> )

\*Number of ICUs included in study is not clear. <sup>†</sup>Before-after study. <sup>‡</sup>Cohort (admissions) and survey. <sup>§</sup>Cohort study; I, intervention; M, measurement; NS, not stated.



**Table 3. Staffing: medical intensity**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Barnett <i>et al.</i> [13] (2000) <sup>5</sup>	1	NS	Consecutive admissions ICU Australia	Level of admissions per clinical sessions per week (M)	Hospital mortality (adjusted— APACHE III)	Improved outcome associated with lower admissions per clinical session per week (that is, higher staffing)
Blunt and Burchett [14] (2000) <sup>†</sup>	1	721	Consecutive admissions ICU UK	Intensivist cover versus nonintensivist out-of-hours cover (I)	Hospital mortality (adjusted— APACHE II)	Improved outcome with intensivist cover
Audit Commission [10] (1999) <sup>*</sup>	52 <sup>‡</sup>	NS	Consecutive admissions ICUs UK	Level of medical staffing and skill mix (M)	Hospital mortality (adjusted— APACHE II)	No association
Audit Commission [10] (1999) <sup>*</sup>	46	NS	Consecutive admissions ICUs UK	Week on/week(s) off versus same session each week consultant cover (M)	Hospital mortality (adjusted— APACHE II)	Improved outcome association with week on/week(s) off consultant cover
Rosenfeld <i>et al.</i> [44] (1999) <sup>†</sup>	1	426	Consecutive admissions ICU USA	Access to remote intensivist versus on-site intensivist (I)	Hospital mortality (adjusted— APACHE III)	Improved outcome with associated to remitt intensivist
Manthous <i>et al.</i> [45] (1997) <sup>†</sup>	1	930	Consecutive admissions Medical ICU USA	Full-time critical care director versus no full-time critical care director (I)	Unit and hospital mortality (crude)	Improved outcome with full-time critical care director
Pezzi <i>et al.</i> [46] (1997) <sup>†</sup>	1	401	Consecutive admissions ICU Italy	Increase (25%) in number of ICU dedicated doctors (I)	Unit mortality (crude)	Improved outcome with increased number of ICU dedicated doctors
Rafkin <i>et al.</i> [47] (1996) <sup>†</sup>	1	7,692	Consecutive admissions ICU USA	Out-of-hours versus no out-of-hours intensivist cover (I)	Hospital mortality (adjusted— APACHE II)	Improved outcome with out-of-hours intensivist cover
Rowan [37] (1992) <sup>*</sup>	26	10,806	Consecutive admissions ICUs UK and Ireland	Shared versus dedicated consultant out-of-hours cover (M)	Hospital mortality (adjusted— APACHE II)	Improved outcome associated with dedicated consultant out-of-hours cover
Kelley <i>et al.</i> [48] (1990) <sup>†</sup>	1	215	Consecutive admissions Medical ICU USA	Increased number of ICU dedicated doctors (I)	Unit and hospital mortality (crude)	No difference
Li <i>et al.</i> [42] (1984) <sup>†</sup>	1	954	Consecutive admissions ICU USA	On-site physicians versus no on-site physicians (I)	ICU, hospital and one year mortality (adjusted—no formal method)	Improved outcome with on/site physicians
Teres <i>et al.</i> [43] (1983) <sup>*</sup>	2	558	Consecutive admissions ICUs USA	Intensivist-led on-site resident team versus private physicians (M)	Unit mortality (crude)	No difference; improved outcome associated with resident team for shock patients ( <i>post hoc</i> )

\*Cohort (admissions) and survey. †Before-after study. ‡Number of ICUs included in analysis is not stated. I, intervention; M, measurement; NS, not stated. <sup>5</sup>Cohort study.

(rather than theoretically) derived through an iterative process. Categories and subcategories were modified as studies were retrieved and reviewed. Studies were categorized according to the type of organizational intervention or measurement evaluated in them. Studies investigating more than one organizational factor were categorized in all relevant factors.

For each included study, key elements reported in the article were extracted and tabulated:

- (1) First author, year of publication, and study design
- (2) Number of ICUs
- (3) Number of admissions
- (4) Context

- (5) Intervention or measurement evaluated
- (6) Outcome measures
- (7) Reported results

Context provided the type of admission, type of ICU, and geographic location (country and region) for the study. Unless otherwise stated, "ICU" referred to an adult, general (mixed medical and surgical) ICU. Three types of study design were defined. A "before-after study" was defined as an observational study that entailed a baseline period of data collection before some organizational intervention, followed by a subsequent period of data collection, with the preperiod and post-period of data collection compared in the results. A "cohort study" was defined as an observational study with



**Table 4. Staffing: nursing autonomy**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Reis Miranda <i>et al.</i> , eds. [22*] (1998)*	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Level of nursing autonomy (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	Improved outcome associated with higher levels of nursing autonomy
Mitchell <i>et al.</i> [49] (1996)	25	8,502	Consecutive admissions ICUs USA	Level of nursing standardization, expertise and discretion (M)	Unit and hospital mortality (adjusted-APACHE III)	No association
Rudy <i>et al.</i> [50] (1995) and Daly <i>et al.</i> [51] (1991)	1 and 2	220	Admissions > 5 days ICUs USA	Low technology nurse managed special care unit versus high technology ICU (I)	Unit mortality (crude)	No difference

\*Not all ICUs were included in all analyses. \*Cohort (admissions) and survey. <sup>§</sup>Randomized controlled trial. I, intervention; M, measurement.

either contemporaneous nonrandom allocation to an organizational intervention or contemporaneous measurement, usually by survey, of an organizational factor, with the two or more groups compared in the results. A "randomized, controlled trial" was defined as an experimental study with random allocation to an organizational intervention, with the two or more groups compared in the results. Unless otherwise stated, the unit of randomization was the patient. No attempt was made to review the scientific quality of the studies.

Only mortality results were considered for the outcome measures, and for observational studies, the method of risk adjustment was extracted where reported. Results presented in the tables are those reported in the article. No attempt was made to re-estimate results or to check statistical significance. Studies were ordered chronologically in each table, commencing with the most recent study.

## Results

The combined search identified 63 publications relating to 54 different studies. Eleven (20.4%) studies were published solely as a conference abstract. Thirty-nine (72.2%) were published as full articles in journals. In addition, there was one book, one research letter, one thesis, and one report. The earliest study retrieved was authored by Siegel *et al.* [12] in 1980, and the latest studies retrieved were published in 2000 [2,13-19]. Thirty (55.6%) of the studies were based in a single center. Four (7.4%) studies were based in pediatric ICUs. Of the studies based in adult ICUs, 76.0% were in general (mixed medical and surgical) ICUs, 14.0% were in medical ICUs, 8.0% were in surgical ICUs, and one was in a cardiothoracic ICU.

The sample size varied considerably across studies. In the single-center studies, the reported sample size

**Table 5. Staffing: nursing intensity**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Audit Commission [10] (1999)*	52 <sup>†</sup>	NS	Consecutive admissions ICUs UK	Level of nurse staffing ratios and skill mix (M)	Hospital mortality (adjusted-APACHE II)	No association
Reis Miranda <i>et al.</i> , eds. [22*] (1998)*	89 <sup>†</sup>	15,591	Consecutive admissions ICUs Europe (12 countries)	Level of nurse qualifications (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	No association
Bastos <i>et al.</i> [52] (1996)*	10	1,734	Consecutive admissions ICUs Brazil	Level of nurse staffing ratios (M)	Hospital mortality (adjusted-APACHE III)	No association
Shortell <i>et al.</i> [24**] (1994)*	42	17,440	Consecutive admissions ICUs USA	Level of nurse staffing ratios and skill mix (M)	Hospital mortality (adjusted-APACHE III)	No association
Solsona <i>et al.</i> [53] (1993) <sup>†</sup>	1	1,426	Consecutive admissions ICU Spain	Increased proportion of supply nurses (summer months) versus regular nurses (rest of year) (M)	Unit mortality (crude)	No association

\*Cohort (admissions) and survey. <sup>†</sup>Cohort study. \*\*Not all ICUs were included in all analyses. I, intervention; M, measurement; NS, not stated.



Table 6. Teamwork

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Mitchell and Kussy [15] (2000) <sup>¶</sup>	1	2,225	Consecutive admissions ICU Australia	Higher vs lower collaboration between medical and nursing teams (I)	Hospital mortality (adjusted- APACHE II)	No difference
Nap <i>et al.</i> [18] (2000) <sup>††</sup>	47	1,633	Consecutive admissions ICUs Europe (9 countries)	Training in nurse-doctor collaboration plus daily use of two protocols covering process of care and professional dialogue versus no intervention (I)	Unit mortality	Improved outcome with training and protocols
Baggs <i>et al.</i> [54,55] (1999, 1992) <sup>§</sup>	3	1,432	Consecutive admissions ICUs (1 MICU, 1 SICU, 1 ICU) USA	Nurse reported level of collaboration between medical and nursing teams over patient discharge decision (M)	Hospital mortality (adjusted- APACHE III)	Improved outcome associated with nurse reported greater collaboration between medical and nursing teams over patient discharge decision (MICU), no association (SICU/ICU)
Baggs <i>et al.</i> [54,55] (1999, 1992) <sup>§</sup>	3	1,432	Consecutive admissions ICUs (1 MICU, 1 SICU, 1 ICU) USA	Doctor reported level of collaboration between medical and nursing teams over patient discharge decision (M)	Hospital mortality (adjusted- APACHE III)	No association (MICU/SICU/ICU)
Reis Miranda <i>et al.</i> , eds. [22*] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Level of organizational commitment (M)	Hospital mortality (adjusted-SAPS II high/low-risk groups)	Improved outcome associated with greater levels of organizational commitment
Reis Miranda <i>et al.</i> , eds. [22*] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Open vs closed culture (M)	Hospital mortality (adjusted-SAPS II high/low-risk groups)	No association
Reis Miranda <i>et al.</i> , eds. [22*] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Level of centralized decision making (M)	Hospital mortality (adjusted-SAPS II high/low-risk groups)	Improved outcome associated with greater levels of decentralized decision-making
Reis Miranda <i>et al.</i> , eds. [22*] (1998) <sup>§</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Level of task differentiation (M)	Hospital mortality (adjusted-SAPS II high/low-risk groups)	Improved outcome associated with lower levels of task differentiation ( <i>ie</i> , ability to cover)
Young <i>et al.</i> [57] (1998) <sup>¶</sup>	1	469	Admissions <sup>††</sup> ICU USA	Standardized (multidisciplinary care process protocol) vs nonstandardized procedures (I)	Hospital mortality (crude)	No difference
Mitchell <i>et al.</i> [49] (1996) <sup>§</sup>	25	8,502	Consecutive admissions ICUs USA	Level of collaboration between medical and nursing teams (M)	Unit and hospital mortality (adjusted- APACHE III)	No association
Pollack <i>et al.</i> [36] (1994) <sup>§</sup>	16	5,415	Consecutive admissions Pediatric ICUs USA	Level of collaboration between medical and nursing teams (M)	Unit mortality (adjusted-PRISM)	No association

(continued on following page)



**Table 6. Teamwork (continued from previous page)**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Shortell <i>et al.</i> [24**], Zimmerman <i>et al.</i> [25] (1994) <sup>§</sup>	42	17,440	Consecutive admissions ICUs USA	Level of caregiver interaction <sup>†</sup> (M)	Hospital mortality (adjusted- APACHE III)	No association
Zimmerman <i>et al.</i> [58] (1993)**	9	3,672	Consecutive admissions ICUs USA	Level of organizational practices <sup>‡</sup> (M)	Hospital mortality (adjusted- APACHE III)	No association
Knaus <i>et al.</i> [7] (1986) <sup>§</sup> , Draper [59] (1987)	19	5,030	Consecutive admissions ICUs USA	Level of collaboration between medical and nursing teams (M)	Hospital mortality (adjusted- APACHE II)	Improved outcome associated with higher levels of collaboration

\*Not all ICUs were included in all analyses. <sup>†</sup>Composite measure encompassing culture, leadership, coordination, communication, and conflict management abilities. <sup>‡</sup>Composite measure encompassing culture, leadership, coordination, communication, and problem solving practices. <sup>§</sup>Cohort (admissions) and survey. <sup>¶</sup>Before-after study. <sup>\*\*</sup>Cohort (admissions) and visit/semistructured interviews. <sup>††</sup>Ventilator-dependent > 72 hours. <sup>†††</sup>Randomized (ICUs) controlled trial. I, intervention; M, measurement; MICU, medical ICU; SICU, surgical ICU.

ranged from 25 to 8,472 admissions. In the multicenter studies (more than one ICU), the reported sample size varied from 100 to 46,587 admissions, with the average number per ICU ranging from 35 to 2,116. Of the 54 studies, the majority (*n* = 32, 59.3%) were undertaken in North America, followed by Europe (*n* = 17, 31.5%).

Only three of the studies were randomized, controlled trials. The remainder were either before-after studies (*n* = 22, 40.7%) or cohort studies with or without an accompanying questionnaire survey (*n* = 29, 53.7%). Of the 51 nonexperimental studies, 30 (58.8%) were fully risk adjusted and 17 (33.3%) were partially risk adjusted, with severity scores used to compare the two or more groups.

The final categorical scheme grouped the 54 studies into eight main categories: staffing, teamwork, volume and pressure of work, protocols, admission to intensive care, technology, structure, and error. The staffing category was further subdivided into management and personnel, intensivists-led, medical intensity, nurse autonomy, and nursing intensity. The retrieved evidence evaluating by category the role and potential impact of organizational factors on mortality after intensive care is summarized in Tables 1 through 12.

A brief review of the retrieved literature indicated that for some areas (*eg*, staffing) more evaluative studies had been undertaken. There was an indication that the areas studied in greater detail were those in which it was easier to quantify or categorize the organizational factor. The intervention or measurement was often reduced to a simple count or categorization, and the conceptual model was neither explored nor stated.

Most studies paid little consideration to the impact of other organizational changes occurring simultaneously with the organizational factor being studied. This problem was exacerbated by the long periods over which some studies, particularly the single-center studies, were undertaken. In addition, generalizability of findings appeared limited by the large number of single-center studies. The existence of randomized, controlled trials of organizational interventions was an important finding.

## Discussion

A number of studies evaluating organizational factors do exist in the critical care literature, and there is evidence that the number of published studies is increasing each year. Reported results from these studies indicate that organizational factors may have an impact on mortality after case mix adjustment. Some areas have been more thoroughly investigated than others and are ripe for systematic review. Such reviews should incorporate careful consideration of the scientific rigor of any included studies and should be conducted before any new primary research in this area.

The literature on organizational factors has been retrieved using a systematic method of searching with explicit criteria for inclusion. A framework for categorization has been developed and proposed based on the retrieved literature. The categorical scheme developed is intended to be not a definitive statement but a useful starting point for discussion and possible future development. A number of studies that have not been brought together before have emerged from the literature.

The problems of reviewing and synthesizing the literature in areas such as service delivery and organization are



**Table 7. Volume and pressure of work**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Tilford <i>et al.</i> [16] (2000) <sup>†</sup>	16	11,106	Consecutive admissions Pediatric ICUs USA	Number of admissions per year (M)	Unit mortality (adjusted-PRISM)	Improved outcome associated with higher number of admissions per year
Goldfrad and Rowan [2] (2000) <sup>†</sup>	91	46,587	Consecutive admissions ICUs UK	Number of admissions per week (M)	Hospital mortality (adjusted-APACHE II)	Improved outcome associated with higher number of admissions per week (nonsurgical admissions), no association (all/surgical admissions)
Tarnow-Mordi <i>et al.</i> [19] (2000) <sup>*</sup>	1	1,050	Consecutive admissions ICU UK	Level of peak occupancy (highest occupancy per shift per stay) and nursing requirement (number of nurses required per shift per stay); ratio of occupied to appropriately staffed beds (M)	Hospital mortality (adjusted-APACHE II)	Improved outcome associated with lower levels of peak occupancy, nursing requirement and lower ratio of occupied to appropriately staffed beds
Goldfrad and Rowan [17] (2000) <sup>†</sup>	62	21,295	Consecutive admissions ICUs UK	Level of admissions discharged from intensive care at night and discharged prematurely (M)	Hospital mortality (adjusted-APACHE II)	Improved outcome associated with lower levels of night and premature discharges
Barnett <i>et al.</i> [13] (2000) <sup>†</sup>	1	NS	Consecutive admissions ICU Australia	Level of admissions per clinical sessions per week (M)	Hospital mortality (adjusted-APACHE III)	Improved outcome associated with lower levels of admissions per clinical sessions per week (that is, lower workload)
Smith <i>et al.</i> [60] (1999) <sup>†</sup>	1	283	Consecutive admissions ICU UK	Level of care on day of unit discharge (M)	Hospital mortality (crude)	Improved outcome associated with lower levels of care provided on day of discharge
Reis Miranda <i>et al.</i> , eds. [22*], Schaufeli and Le Blanc [23] (1998) <sup>*</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Level of nursing workload (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	Improved outcome associated with lower levels of nursing workload for low risk patients
Jonasson <i>et al.</i> [61] (1998) <sup>†</sup>	1	8,472	Consecutive admissions ICU Sweden	Number of admissions per year caused by reduction in number of ICU beds (M)	Unit mortality (crude)	No association
Bastos <i>et al.</i> [52] (1996) <sup>*</sup>	10	1,734	Consecutive admissions ICUs Brazil	Level of diagnostic diversity (number of different admitting diagnostic categories) (M)	Hospital mortality (adjusted-APACHE III)	No association
Mitchell <i>et al.</i> [49] (1996) <sup>*</sup>	25	8,502	Consecutive admissions ICUs USA	Level of diagnostic diversity (number of different admitting diagnostic categories) (M)	Unit and hospital mortality (adjusted-APACHE III)	No association
Jones and Rowan [62] (1995) <sup>*</sup>	26	10,806	Consecutive admissions ICUs UK and Ireland	Number of admissions per month (M)	Hospital mortality (adjusted-APACHE II)	No association
Pollack <i>et al.</i> [36] (1994) <sup>†</sup>	16	5,415	Consecutive admissions Pediatric ICUs, randomly selected USA	Number of admission per month (M)	Unit mortality (adjusted-PRISM)	No association
Shortell <i>et al.</i> [24**] (1994) <sup>*</sup>	42	17,440	Consecutive admissions ICUs USA	Level of diagnostic diversity (number of different admitting diagnostic categories) (M)	Hospital mortality (adjusted-APACHE III)	Improved outcome associated with lower levels of diagnostic diversity

\*Not all ICUs were included in all analyses. <sup>†</sup>Cohort study. \*Cohort (admissions) and survey. I, intervention; M, measurement; NS, not stated.



Table 8. Protocols

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Nap <i>et al.</i> [18] (2000) RCT (ICUs)*	47	1,633	Consecutive admissions ICUs Europe (9 countries)	Training in nurse-doctor collaboration plus daily use of two protocols covering process of care and professional dialogue versus no intervention (I)	Unit mortality	Improved outcome with training and protocols
Kern and Kox [21] (1999) <sup>§</sup>	1	1,526	Consecutive admissions Cardiothoracic ICU Germany	Standardized (treatment, discharge, ward round, medical cover, staff management/personnel protocols) versus nonstandardized procedures (I)	Hospital mortality (adjusted- APACHE II)	Improved outcome with standardized procedures
Marx <i>et al.</i> [63] (1999) <sup>§</sup>	1	157	Consecutive admissions General ICU USA	Standardized (laboratory, ECG/chest radiograph, weaning, drug protocols) versus nonstandardized procedures (I)	Mortality when measured, not stated (crude)	No difference
Reis Miranda <i>et al.</i> , eds. [22*] (1998) <sup>¶</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Level of EOF <sup>†</sup> (M)	Hospital mortality (adjusted-SAPS II high/low risk groups)	Improved outcome associated with EOF
Reis Miranda <i>et al.</i> , eds. [22*] (1998) <sup>¶</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Results-oriented versus process-oriented (use of protocols) culture (M)	Hospital mortality (adjusted-SAPS II high/low risk groups and European region)	Improved outcome associated with results-oriented culture
Young <i>et al.</i> [57] (1998) <sup>§</sup>	1	469	Admissions, ventilator- dependent > 72 hours ICU USA	Standardized (multidisciplinary care process protocol) versus nonstandardized procedures (I)	Hospital mortality (crude)	No difference
Kollef <i>et al.</i> [64] (1997) RCT**	4	357	Admissions, ventilated ICUs USA	Protocol-directed (nonphysician) versus physician-directed weaning procedure (I)	Hospital mortality (crude)	No difference
Pilon <i>et al.</i> [65] (1997) <sup>§</sup>	1	150	Admissions, randomly selected ICU Canada	Protocol for blood gas measurement (number and appropriateness) versus no protocol (I)	Unit mortality (crude)	No difference
Mitchell <i>et al.</i> [49] (1996) <sup>¶</sup>	25	8,502	Consecutive admissions ICUs USA	Level of work standardization (M)	Unit and hospital mortality (adjusted- APACHE III)	No association
Roberts <i>et al.</i> [66] (1993) <sup>§</sup>	2	4,232	Consecutive admissions Medical and surgical ICU USA	Protocol for nine frequent investigations versus no protocol (I)	Unit mortality (crude)	No difference
Rowan [37] (1992) <sup>¶</sup>	26	10,806	Consecutive admissions ICUs UK and Ireland	Level of reported use of protocols (M)	Hospital mortality (adjusted- APACHE II)	Improved outcome associated with lower levels of reported use of protocols

\*Not all ICUs were included in all analyses. <sup>†</sup>EOF, Elementary Organizational Framework: composite measure encompassing written job descriptions, regular staff meetings about both clinical and nonclinical issues, existence of formally written protocols to guide care activities, and regular evaluation of staff. \*Randomized (ICUs), controlled trial. <sup>§</sup>Before-after study. <sup>¶</sup>Cohort (admissions) and survey. \*\*Randomized controlled trial. CA, consecutive admissions; ECG, electrocardiogram; I, intervention; M, measurement.



**Table 9. Admission to intensive care**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Sprung <i>et al.</i> [67,68] (1999)*	1	382	Consecutive patients triaged for admission to intensive care ICU Israel	Admission vs delayed admission vs no admission to intensive care (M)	Hospital mortality (crude)	Improved outcome associated with admission to intensive care
Metcalf <i>et al.</i> [69] (1997)*	6	645	Consecutive referrals for admission to intensive care ICUs UK	Admission vs no admission to intensive care (M)	90-day mortality (crude)	Improved outcome associated with admission to intensive care

\*Cohort study.

well known [11], and the specific context of intensive care is no exception. The relevant evidence was distributed throughout the literature and was not indexed in electronic databases in a way that was favorable to retrieving it (electronic libraries tend to adopt a biomedical-intervention perspective). The search strategy was very important, but despite the wide range of literature sources searched, it is likely that not all published evidence was retrieved. Also, there may have been differential retrieval of the published evidence according to the different categories, with the evidence in some cat-

egories being more nearly complete than in others. For example, a lower proportion of the available evidence concerning protocols than concerning staffing may have been retrieved. In addition, this search was subject to both publication and English language biases.

With regard to future primary research, it is important both to undertake qualitative research for developing conceptual models and to build on earlier studies by integrating new quantitative studies into the conceptual framework. If more were known about the mechanisms

**Table 10. Technology**

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Rosenfeld <i>et al.</i> [44] (1999) <sup>†</sup>	1	426	Consecutive admissions ICU USA	Telemedicine access to remote intensivist vs no access (I)	Hospital mortality (adjusted— APACHE III)	Improved outcome with telemedicine access to remote intensivist
Mitchell <i>et al.</i> [49] (1996) <sup>§</sup>	25	8,502	Consecutive admissions ICUs USA	Level of perceived technology (M)	Unit and hospital mortality (adjusted— APACHE III)	No association
Bastos <i>et al.</i> [52] (1996) <sup>§</sup>	10	1,734	Consecutive admissions ICUs Brazil	Level of available, recommended technology (M)	Hospital mortality (adjusted— APACHE III)	Improved outcome associated with higher levels of available, recommended technology
Rudy <i>et al.</i> [50] (1995), Daly <i>et al.</i> [51] (1991)*	1 (2)	220	Admissions > 5 days ICUs USA	Low technology nurse managed special care unit vs high technology ICU (I)	Unit mortality (crude)	No difference
Shortell <i>et al.</i> [24**], Zimmerman <i>et al.</i> [25] (1991) <sup>§</sup>	42	17,440	Consecutive admissions ICUs USA	Level of available, recommended technology (M)	Hospital mortality (adjusted— APACHE III)	Improved outcome associated with higher levels of available, recommended technology
Siegel <i>et al.</i> [12] (1980)**	1	2,859	Consecutive admissions Surgical ICU USA	Established vs developmental use of computer- based CARE system (I)	Unit mortality (adjusted—no formal method)	Improved outcome with established use of CARE

<sup>†</sup>Before-After Survey. <sup>§</sup>Cohort (admissions) and survey. \*Randomized controlled trial. \*\*Cohort study. <sup>††</sup>Before-after study. CARE, Clinical Assessment, Research and Education; I, intervention; M, measurement.



Table 11. Structure

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
Apostolakos <i>et al.</i> [70] (1999)**	1	25	Admissions, ventilator-dependent (ave, 47 days) ICU USA	RSDU vs no RSDU (I)	Hospital mortality (adjusted-MPM <sub>0</sub> )	No difference
Reis-Miranda <i>et al.</i> , eds. [22] (1998) <sup>†</sup>	89*	15,591	Consecutive admissions ICUs Europe (12 countries)	Number of ICU beds (M)	Hospital mortality (adjusted-SAPS II high/low-risk groups)	Optimal outcome associated with nine beds (lesser or greater numbers of beds associated with worse outcome)
Rudy <i>et al.</i> [50] (1995), Daly <i>et al.</i> [51] (1991) <sup>†</sup>	1, 2	220	Admissions in ICU > 5 days ICUs USA	Low technology nurse managed special care unit vs high technology ICU (I)	Unit mortality (crude)	No difference
Pollack <i>et al.</i> [36] (1994)	16	5,415	Consecutive admissions Pediatric ICUs, randomly selected USA	Teaching hospitals vs nonteaching hospitals (M)	Unit mortality (adjusted-PRISM)	Improved outcome associated with nonteaching hospitals
Pollack <i>et al.</i> [36] (1994) <sup>†</sup>	16	5,415	Consecutive admissions Pediatric ICUs, randomly selected USA	Number of ICU beds (M)	Unit mortality (adjusted-PRISM)	No association
Knaus <i>et al.</i> [7] (1986) <sup>†</sup>	19	5,030	Consecutive admissions ICUs USA	Teaching hospitals vs nonteaching hospitals (M)	Hospital mortality (adjusted-APACHE II)	No association

\*Not all ICUs were included in all analyses. \*\*Cohort study with historical controls. <sup>†</sup>Cohort (admissions) and survey. <sup>‡</sup>Randomized, controlled trial. I, intervention; M, measurement; RSDU, respiratory step-down unit.

by which organizational factors affected outcome, greater confidence could be placed in the interpretation of study results.

Rigorous evaluation of the optimum way to organize and deliver intensive care is essential. Variation in case mix adjusted hospital mortality after intensive care is an old

theme. This study has shown that emerging data will help us understand mortality differences and deliver better outcomes for patients through improved delivery of care. It is hoped that these findings will form the springboard for detailed, systematic reviews on particular areas, such as the review conducted recently by Pronovost *et al.* [20••].

Table 12. Error

Study (year) Study design	ICUs, <i>n</i>	Admissions, <i>n</i>	Context	Intervention or measurement	Outcome measures	Reported results
McQuillan <i>et al.</i> [71] (1998) <sup>†</sup>	2	100	Consecutive admissions ICUs UK	Externally assessed, suboptimal versus optimal care before admission to ICU (M)	Hospital mortality (adjusted-APACHE II)	No association
Giraud <i>et al.</i> [72] (1993) <sup>†</sup>	2	400	Consecutive admissions ICUs France	Major versus no, minor, or moderate (combined) iatrogenic complications (M)	Unit mortality (adjusted-no formal method) care	Improved outcome associated with no, minor, or moderate (combined) iatrogenic complications (admissions staying > 24 h), no association (all admissions)

<sup>†</sup>Cohort (admissions) and retrospective, confidential case review. <sup>‡</sup>Cohort study. I, intervention; M, measurement.



## References and recommended reading

Papers of particular interest, published within the annual period of review, have been highlighted as:

- Of special interest
- Of outstanding interest

- 1 Intensive Care National Audit and Research Center: Annual Report from the Case Mix Program Database. London: Intensive Care National Audit and Research Center; 2001.
- 2 Goldfrad C, Rowan K: Does "practice make perfect"? volume of work and outcome in intensive care [abstract]. *J Epidemiol Community Health* 2000, 54:A9.
- 3 Knaus WA, Draper EA, Wagner DP, et al.: APACHE II: a severity of disease classification system. *Crit Care Med* 1985, 13:818-829.
- 4 Knaus WA, Wagner DP, Draper EA, et al.: The APACHE III prognostic system: risk prediction of hospital mortality for critically ill hospitalized adults. *Chest* 1991, 100:1619-1636.
- 5 Lemeshow S, Teres D, Klar J, et al.: Mortality Probability Models (MPM II) based on an international cohort of intensive care unit patients. *JAMA* 1993, 270:2478-2486.
- 6 Le Gall J-R, Lemeshow S, Saulnier F: A new Simplified Acute Physiology Score (SAPS II) based on a European/North American multicenter study. *JAMA* 1993, 270:2957-2963.
- 7 Knaus WA, Draper EA, Wagner DP, et al.: An evaluation of outcome from intensive care in major medical centers. *Ann Intern Med* 1986, 104:410-418.
- 8 Rowan KM, Kerr JH, Major E, et al.: Intensive Care Society's APACHE II study in Britain and Ireland-II: outcome comparisons of intensive care units after adjustment for case mix by the APACHE II method. *BMJ* 1993, 307:977-981.
- 9 Knaus WA, Wagner DP, Zimmerman JE, et al.: Variations in mortality and length of stay in intensive care units. *Ann Intern Med* 1993, 118:753-761.
- 10 Audit Commission: Critical to Success: The Place of Efficient and Effective Critical Care Services Within the Acute Hospital. London: Audit Commission; 1999.
- 11 Mays N, Roberts E, Popay J: Synthesizing research evidence. In *Studying the Organisation Delivery of Health Services: Research Methods*. Edited by Fulop N, Allen P, Clarke A, et al. London: Routledge; 2001.
- 12 Siegel JH, Cerra FB, Moody EA, et al.: The effect on survival of critically ill and injured patients of an ICU teaching service organized about a computer-based physiologic CARE system. *J Trauma* 1980, 20:558-579.
- 13 Barnett R, Cook D, Henderson A, et al.: An association between senior medical staff workload and ICU mortality: do adequate staffing levels improve mortality? [abstract]. Abstracts of the 25th Annual Scientific Meeting of the Australia and New Zealand Intensive Care Society, Canberra 2000:191.
- 14 Blunt MC, Burchett KR: Out-of-hours consultant cover and case-mix-adjusted mortality in intensive care. *Lancet* 2000, 356:735-736.
- 15 Mitchell IA, Kussy J: Collaborative practice in the intensive care unit: more than just words [abstract]. Abstracts of the 25th Annual Scientific Meeting of the Australia and New Zealand Intensive Care Society, Canberra 2000:196.
- 16 Tilford JM, Simpson PM, Green JW, et al.: Volume-outcome relationships in pediatric intensive care units. *Pediatrics* 2000, 106:289-294.
- 17 Goldfrad C, Rowan K: Consequences of discharges from intensive care at night. *Lancet* 2000, 355:1138-1142.
- 18 Nap R, Alvaro MS, Fidler V, et al.: Collaborative practice and clinical outcomes in the ICU [abstract]. *Crit Care* 2000, 4(suppl 1):S126.
- 19 Tarnow-Mordi W, Hau C, Warden A, et al.: Hospital mortality in relation to staff workload: a 4-year study in an adult intensive-care unit. *Lancet* 2000, 356:185-189.
- 20 Pronovost P, Angus D, Dorman T, et al.: Does an intensivist improve outcome in critically ill patients? a systematic review. *Crit Care Med* 2001, submitted. Important systematic review of an organizational factor and outcome.
- 21 Kern H, Kox WJ: Impact of standard procedures and clinical standards on cost-effectiveness and intensive care unit performance in adult patients after cardiac surgery. *Intensive Care Med* 1999, 25:1367-1373.
- 22 Reis-Miranda D, Ryan D, Schaufeli W, et al. (eds): *Organisation and Management of Intensive Care: A Prospective Study in 12 European Countries*. Berlin: Springer; 1998. Report of five substudies. Those on personnel, organization, and culture are of particular interest.
- 23 Schaufeli W, Le Blanc W: Workload, nurse burnout and ICU-performance [abstract]. *Intensive Care Med* 1996, 22(suppl 3):S300.
- 24 Shortell SM, Zimmerman JE, Rousseau DM, et al.: The performance of intensive care units: does good management make a difference? *Med Care* 1994, 32:508-525. An important study that both discusses and is underpinned by a conceptual model.
- 25 Zimmerman JE, Knaus WA, Draper EA, et al.: Organizational correlates with ICU efficiency and effectiveness [abstract]. *Crit Care Med* 1991, 19:S35.
- 26 Tenner PA, Son M, Dibrell H, et al.: Care of critically ill pediatric patients by hospitalists is associated with improved survival [abstract]. *Crit Care Med* 1999, 27:A122.
- 27 Hanson CW III, Deutschman CS, Anderson HL III, et al.: Effects of an organized critical care service on outcomes and resource utilization: a cohort study. *Crit Care Med* 1999, 27:270-274.
- 28 Pronovost PJ, Jenckes MW, Dorman T, et al.: Organizational characteristics of intensive care units related to outcomes of abdominal aortic surgery. *JAMA* 1999, 281:1310-1317.
- 29 Bach PB, Carson SS, Leff A: Outcomes and resource utilization for patients with prolonged critical illness managed by university-based or community-based subspecialists. *Am J Respir Crit Care Med* 1998, 158:1410-1415.
- 30 Multz AS, Chalfin DB, Samson IM, et al.: A "closed" medical intensive care unit (MICU) improves resource utilization when compared with an "open" MICU. *Am J Respir Crit Care Med* 1998, 157:1468-1473.
- 31 Ghorra S, Reinert SE, Cioffi W, et al.: Analysis of the effect of conversion from open to closed surgical intensive care unit. *Ann Surg* 1999, 229:163-171.
- 32 Tai DY, Goh SK, Eng PC, et al.: Impact on quality of patient care and procedure use in the medical intensive care unit (MICU) following reorganisation. *Ann Acad Med Singapore* 1998, 27:309-313.
- 33 Eng P, Tai D, Goh S, et al.: Patient outcome following the adoption of a closed system medical intensive care unit (MICU) [abstract]. *Intensive Care Med* 1995, 21(suppl 1):S96.
- 34 Marini CP, Nathan IM, Ritter G, et al.: The impact of full-time surgical intensivists on ICU utilization and mortality [abstract]. *Crit Care Med* 1995, 23:A235.
- 35 Carson SS, Stocking C, Podsadecki T, et al.: Effects of organizational change in the medical intensive care unit of a teaching hospital: a comparison of "open" and "closed" formats. *JAMA* 1996, 276:322-328.
- 36 Pollack MM, Cuedon TT, Patel KM, et al.: Impact of quality-of-care factors on pediatric intensive care unit mortality. *JAMA* 1994, 272:941-946.
- 37 Rowan KM: *Outcome Comparisons of Intensive Care Units in Great Britain and Ireland Using the APACHE II Method [DPhil thesis]*. Oxford: University of Oxford; 1992.
- 38 Brown J, Sullivan G: Effect on ICU mortality of a full time critical care specialist. *Chest* 1989, 96:127-129.
- 39 Pollack MM, Katz RW, Ruttiman UE, et al.: Improving the outcome and efficiency of intensive care: the impact of an intensivist. *Crit Care Med* 1988, 16:11-17.
- 40 Hainer BL, Lawler FH: Comparison of critical care provided by family physicians and general internists. *JAMA* 1988, 260:354-358.
- 41 Reynolds HN, Haupt MT, Thill-Baharozian MC, et al.: Impact of critical care physician staffing on patients with septic shock in a university hospital medical intensive care unit. *JAMA* 1988, 260:3446-3450.
- 42 Li TC, Phillips MC, Shaw L, et al.: On-site physician staffing in a community hospital intensive care unit: impact on test and procedure use and on patient outcome. *JAMA* 1984, 252:2023-2027.
- 43 Teres D, Brown RB, Lemeshow S, et al.: A comparison of mortality and charges in two differently staffed intensive care units. *Inquiry* 1983, 20:282-289.
- 44 Rosenfeld B, Dorman T, Pronovost P, et al.: Remote management improves ICU outcomes [abstract]. *Crit Care Med* 1999, 27:A153.
- 45 Manthous CA, Amoateng-Adjepong Y, Al Kharrat T, et al.: Effects of a medical intensivist on patient care in a community teaching hospital. *Mayo Clin Proc* 1997, 72:391-399.
- 46 Pezzi A, Assi E, Latis G, et al.: The effects of management on an intensive care unit performances [abstract]. *Intensive Care Med* 1997, 23(suppl 1):S159.
- 47 Rafkin H, Hoyt J: Twenty-four hour physician coverage reduces mortality and length of stay in the ICU [abstract]. *Intensive Care Med* 1996, 22(suppl 3):S302.
- 48 Kelley MA, Nachamkin DC, Escarce JJ, et al.: Expansion of the medical intensive care unit: clinical consequences in a large urban hospital. *Crit Care Med* 1990, 18:945-949.



## 296 Critical care outcomes

- 49 Mitchell PH, Shannon SE, Cain KC, et al.: Critical care outcomes: linking structures, processes, and organizational and clinical outcomes. *Am J Crit Care* 1996, 5:353-363.
- 50 Rudy EB, Daly BJ, Douglas S, et al.: Patient outcomes for the chronically critically ill: special care unit versus intensive care unit. *Nurs Res* 1995, 44:324-331.
- 51 Daly BJ, Phelps C, Rudy EB: A nurse-managed special care unit. *J Nurs Adm* 1991, 21:31-38.
- 52 Bastos PG, Knaus WA, Zimmerman JE, et al.: The importance of technology for achieving superior outcomes from intensive care. *Intensive Care Med* 1996, 22:664-669.
- 53 Solsona JF, Marrugat J, Masdeu G, et al.: Supply nursing and intensive care unit outcome [research letter]. *Lancet* 1993, 342:1240-1241.
- 54 Baggs JG, Schmitt MH, Mushlin AI, et al.: Association between nurse-physician collaboration and patient outcomes in three intensive care units. *Crit Care Med* 1999, 27:1991-1998.
- 55 Baggs JG, Ryan SA, Phelps CE, et al.: The association between interdisciplinary collaboration and patient outcomes in a medical intensive care unit. *Heart Lung* 1992, 21:18-24.
- 56 Sanders G, van der Veen J: ICU-culture and effectiveness of ICUs [abstract]. *Intensive Care Med* 1996, 22(suppl 3):S300.
- 57 Young MP, Gooder VJ, Oltermann MH, et al.: The impact of a multidisciplinary approach on caring for ventilator-dependent patients. *Int J Qual Health Care* 1998, 10:15-26.
- 58 Zimmerman JE, Shortell SM, Rousseau DM, et al.: Improving intensive care: observations based on organizational case studies in nine intensive care units: a prospective, multicenter study. *Crit Care Med* 1993, 21:1443-1451.
- 59 Draper EA: Effects of nurse/physician collaboration and nursing standards on ICU patients' outcomes. *Curr Concepts Nurs* 1987, 1:2-9.
- 60 Smith L, Orts CM, O'Neil I, et al.: TISS and mortality after discharge from intensive care. *Intensive Care Med* 1999, 25:1061-1065.
- 61 Jonasson U, Lindahl O, Walther S: Effects of diminished access to ICU beds on resource consumption and outcome in a community hospital [abstract]. *Intensive Care Med* 1998, 24(suppl 1):S121.
- 62 Jones J, Rowan K: Is there a relation between the volume of work carried out in intensive care and its outcome? *Int J Technol Assess Health Care* 1995, 11:762-769.
- 63 Marx WH, DeMaintenon NL, Mooney KF, et al.: Cost reduction and outcome improvement in the intensive care unit. *J Trauma* 1999, 46:625-630.
- 64 Kollef MH, Shapiro SD, Silver P, et al.: A randomized, controlled trial of protocol-directed versus physician-directed weaning from mechanical ventilation. *Crit Care Med* 1997, 25:567-574.
- 65 Pilon C, Leathley M, London R, et al.: Practice guidelines for arterial blood gas measurement in the intensive care unit decreases numbers and increases appropriateness of tests. *Crit Care Med* 1997, 25:1308-1313.
- 66 Roberts DE, Bell DD, Ostryzniuk T, et al.: Eliminating needless testing in intensive care—an information-based team management approach. *Crit Care Med* 1993, 21:1452-1458.
- 67 Sprung CL, Geber D, Eidelman LA, et al.: Evaluation of triage decisions for intensive care admission. *Crit Care Med* 1999, 27:1073-1079.
- 68 Sprung CL, Oppenheim A, Pizov R, et al.: Intensive care improves patient survival [abstract]. *Crit Care Med* 1999, 27:A154.
- 69 Metcalfe MA, Sloggett A, McPherson K: Mortality among appropriately referred patients refused admission to intensive care. *Lancet* 1997, 350:7-12.
- 70 Apostolakis MJ, Salipante D, LaFaro M, et al.: Effects of a respiratory step-down unit on chronically ventilator dependent patient's length of time on mechanical ventilation in the ICU, in the hospital, and on mortality in a tertiary care university medical center [abstract]. *Crit Care Med* 1999, 27:A154.
- 71 McQuillan P, Pilkington S, Allan A, et al.: Confidential inquiry into quality of care before admission to intensive care. *BMJ* 1998, 316:1853-1858.
- 72 Giraud T, Dhainaut J-F, Vaxelaire J-F, et al.: Iatrogenic complications in adult intensive care units: a prospective two-center study. *Crit Care Med* 1993, 21:40-51.



## Appendix Two

### Protocol for study investigating organisation of intensive care

#### Introduction

This shortened protocol is based on project documentation [1], which describes the work so far undertaken in a study of the organisation of intensive care. The aim of the project is to provide a critique of existing theories and models for intensive care organisation and make a theoretically informed contribution to understanding the local organisation of the work of intensive care units (ICUs).

#### Overview of literature

There is considerable variation in intensive care in terms of structures, processes and outcomes, both in the UK [2] and elsewhere in Europe [3]. Sophisticated case mix adjustment methods for intensive care [4-8] and detailed quantitative studies [9-10] have been inconclusive with respect to the effect of organisational and managerial factors on patient outcome. In general, studies have not adequately characterised the work of intensive care units, and have tended to operationalise those factors which are easily measurable rather than those which might have more theoretical power or practical use. Theoretical models of intensive care which have been used are the ICU as an ‘uncertainty reducing unit’[9], the ICU as a ‘discretionary-type operating pattern’[11] and the ICU as a ‘safety critical environment’[12])

#### Methods

This study aims to develop the understanding of organisation and management in intensive care by means of a more detailed, qualitative, observational method [13]. It is hoped that this will generate hypotheses for quantitative data modelling at a later date. The methodology selected emphasises the importance of empirical data and studying the workplace *in situ*. The study can be regarded as a non-participant observation study. The everyday work of intensive care units will be observed, and notes taken by the researcher. Informal and formal in-depth interviews will also be deployed. Notes from observations will be typed up, and interviews will be transcribed, for analysis.

#### Sampling

The sampling of ICUs is informed by Patton’s recommendation that “qualitative sampling designs specify *minimum samples* based on expected reasonable coverage of the phenomenon given the purpose of the study and stakeholder interests.” [14] (emphasis in original). The stakeholders for this study’s research findings are ICU managers and leaders. ICUs selected will cover a range of ICUs, including, in particular, both University Teaching Hospitals and District General Hospitals; ICUs of different sizes; and ICUs in different geographical regions. Observation is restricted to no more than four ICUs in order to gain sufficient in-depth understanding of each. The sample is not intended to be statistically representative, but rather to exhibit the range of variation in the “population” of ICUs. Approximately three months’ worth of observational data will be collected in total from the different ICUs.



## Data management and analysis

Field notes will be typed up as soon as possible after periods of observation and stored electronically; several copies will be made both for analysis and as 'back-up'. No patient data will be collected. All data will be anonymised as they are typed up. On-going analysis will be supplemented by the collection of new data [13].

## Ethics

Ethical approval for this study has been given by the London School of Hygiene and Tropical Medicine Ethics Committee, and will be sought from Local Research Ethics Committees for each ICU. Each visit to each ICU will entail on-going negotiations with staff members as they meet with the researcher and are observed in their work. The British Sociological Association's "Statement of ethical practice" [15] is the major professional statement on the ethics of qualitative, observational study, and is clear about the principle of 'informed consent' for all participants. Whilst formal, signed consent will be obtained from appropriate gatekeepers at each ICU, the purposes of the study will be explained to other members of staff as necessary, and an information sheet has been prepared for this purpose.

## References

1. Carmel, S. (2000). *The organisation of work in intensive care*. Unpublished project documentation, London School of Hygiene and Tropical Medicine.
2. Audit Commission (1999). *Critical to success: the place of efficient and effective critical care services within the acute hospital*. London: Audit Commission.
3. Vincent, J.-L., P. Suter, et al. (1997). "Organization of intensive care units in Europe: lessons from the EPIC study." *Intensive Care Medicine* 23: 1181-1184.
4. Knaus, W.A., E.A. Draper, et al. (1985). "APACHE II: a severity of disease classification system". *Critical Care Medicine* 13: 818-829.
5. Knaus, W.A., D.P. Wagner, et al. (1991). "The APACHE III prognostic system. Risk prediction of hospital mortality for critically ill hospitalized adults". *Chest* 100: 1619-1636.
6. Rowan, K. (1992). *Outcome comparisons of intensive care units in Great Britain and Ireland using the APACHE II method*. D.Phil thesis, University of Oxford.
7. LeGall, J.-R., S. Lemeshow, et al. (1993). "A new Simplified Acute Physiology Score (SAPS II) based on a European/North American multicenter study". *Journal of the American Medical Association* 270: 2957-2963.
8. Lemeshow, S., D. Teres, et al. (1993). "Mortality Probability Models (MPM II) based on an international cohort of intensive care unit patients." *Journal of the American Medical Association* 270: 2478-2486.
9. Miranda, D.R., D.W. Ryan, et al., (eds). (1998). *Organisation and management of intensive care: a prospective study in 12 European countries*. Berlin: Springer.
10. Shortell, S., J.E. Zimmerman, et al (1994). "The performance of intensive care units: does good management make a difference?" *Medical Care* 32 (5): 508-25 (May).
11. Mitchell, P., S. Shannon, K. et al. (1996). "Critical care outcomes: linking structures, processes, and organizational and clinical outcomes". *American Journal of Critical Care*. 5(5): 353-363.
12. Sexton, B., E. Thomas, R. Helmreich. (2000). "Error, stress and teamwork in medicine and aviation: cross sectional surveys." *British Medical Journal* 320: 745-749
13. Murphy, E., R. Dingwall, et al. (1998) "Qualitative research methods in health technology assessment: a review of the literature" *Health Technology Assessment* 1998; 2 (16).
14. Patton, M.Q. (1990). *Qualitative evaluation and research methods*. London: Sage
15. British Sociological Association (1992). "Code of Ethics of the British Sociological Association". *Sociology* 26 (4): 703-7.





**Study to investigate the organisation of work in intensive care: information sheet**

This research project is an exploration of organisational factors in the work of intensive care units. The purpose of the study is to develop more fully the understanding of different kinds of work in intensive care. In the short term, it is hoped that the study results will illuminate the findings of a number of quantitative studies of intensive care organisation. A longer term aim is to provide information which will enable Intensive Care Unit (ICU) leaders and managers to organise their units more effectively.

The study is an exploratory, qualitative and prospective observational investigation to identify different organisational features of ICUs. It is planned to conduct observational studies in up to four ICUs and conduct informal interviews with staff in those units. The data will relate to different aspects of work from the perspective of ICU staff. The study is not in any way an assessment of the staff or the unit itself; there will be no covert observation, and any member of staff who would rather not have their work observed will be perfectly at liberty to refuse. This is in accordance with the Ethical Guidelines of the British Sociological Association which state that informed consent needs to be continually negotiated with all research participants.

Your assistance with allowing an observational study to take place will be greatly appreciated. You may approach the researcher to ask about the study, or if you have concerns about the study, at any time.

All data recorded and stored will be anonymised prior to publication and dissemination of research findings: this includes the identities of the hospital, unit and staff. Personal details, maintained for the purposes of research administration, will be kept at a separate location from the data recorded. Both personal details and recorded data will be kept secure. The research findings will be disseminated through intensive care meetings (e.g. Intensive Care Society Scientific Meeting), Health organisation studies conferences, and the relevant scientific literature.

This study has been approved by the Ethics Committee of London School of Hygiene and Tropical Medicine and the Local Research Ethics Committee.

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## References

- Alderson, P. (1998), 'Theories in health care and research: The importance of theories in health care', *British Medical Journal*, 317, 1007-10.
- Allen, D. (1997), 'The nursing-medical boundary: a negotiated order?' *Sociology of Health and Illness*, 19, 4, 498-520.
- Allen, D. (2001a), 'Nursing and sociology: an uneasy marriage? (Review article)', *Sociology of Health and Illness*, 23, 3, 386-96.
- Allen, D. (2001b), *The Changing Shape of Nursing Practice*, London, Routledge.
- Allen, D. (2002[2000]), 'Doing occupational demarcation: the boundary work of nurse managers in a district general hospital', in Rafferty, A.M. and Traynor, M. (eds.), *Exemplary Research for Nursing and Midwifery*, London, Routledge.
- Allnutt, M.F. (1987), 'Human factors in accidents', *British Journal of Anaesthesia*, 59, 856-64.
- Anderson, W. (1992), 'The reasoning of the strongest: the polemics of skill and science in medical diagnosis', *Social Studies of Science*, 22, 4, 653-84.
- Angus, D. and Pinsky, M. (1997), 'Risk prediction: judging the judges (editorial)', *Intensive Care Medicine*, 23, 363-5.
- Anspach, R.R. (1987), 'Prognostic conflict in life-and-death decisions: the organization as an ecology of knowledge', *Journal of Health and Social Behavior*, 28, 215-31.
- Apostolakos, M.J., Salipante, D., LaFaro, M. and Trawick, D.R. (1999), 'Effects of a respiratory step-down unit on chronically ventilator dependent patients' length of time on mechanical ventilation, in the ICU, in the hospital, and on mortality in a tertiary care university medical center (abstract)', *Critical Care Medicine*, 27, 1, suppl., A154.
- Armstrong, D. (1977), 'Clinical sense and clinical science', *Social Science and Medicine*, 11, 599-601.
- Armstrong, D. (1987), 'Theoretical tensions in biopsychosocial medicine', *Social Science and Medicine*, 25, 11, 1213-8.
- Asch, D.A., Shea, J.A., Jedrzejewski, K.M. and Bosk, C.L. (1997), 'The limits of suffering: critical care nurses' views of hospital care at the end of life', *Social Science and Medicine*, 45, 11, 1661-8.
- Association of Anaesthetists of Great Britain and Ireland (1988), *Intensive Care Services: Provision for the Future*, London, Association of Anaesthetists of Great Britain and Ireland.



- Atkinson, P. (1984), 'Training for certainty', *Social Science and Medicine*, 19, 9, 949-56.
- Atkinson, P. (1995), *Medical Talk and Medical Work: the Liturgy of the Clinic*, London, Sage.
- Atkinson, P., Reid, M. and Sheldrake, P. (1977), 'Medical mystique', *Sociology of Work and Occupations*, 4, 3, 243-80.
- Atkinson, S., Bihari, D., Smithies, M., Daly, K., Mason, R. and McColl, I. (1994), 'Identification of futility in intensive care', *The Lancet*, 344, 1203-6.
- Audit Commission (1999), *Critical to Success: the Place of Efficient and Effective Critical Care Services within the Acute Hospital*, London, Audit Commission.
- Bach, P.B., Carson, S.S. and Leff, A. (1998), 'Outcomes and resource utilization for patients with prolonged critical illness managed by university-based or community-based subspecialists', *American Journal of Respiratory and Critical Care Medicine*, 158, 1410-5.
- Baggs, J.G., Ryan, S.A., Phelps, C.E., Richeson, J.F. and Johnson, J.E. (1992), 'The association between interdisciplinary collaboration and patient outcomes in a medical intensive care unit', *Heart & Lung*, 21, 1, 18-24.
- Baggs, J.G., Schmitt, M.H., Mushlin, A.I., Mitchell, P.H., Eldredge, D.H., Oakes, D. and Hutson, A.D. (1999), 'Association between nurse-physician collaboration and patient outcomes in three intensive care units', *Critical Care Medicine*, 27, 9, 1991-8.
- Baker, J.P. (1996), *The Machine in the Nursery*, Baltimore, John Hopkins University Press.
- Barach, P. (2001), 'Enhancing patient safety: beginning the dialogue in health services research (editorial)', *Journal of Health Services Research and Policy*, 6, 2, 67-9.
- Barach, P. and Small, S.D. (2000), 'How the NHS can improve safety and learning (editorial)', *British Medical Journal*, 320, 1683-4.
- Barley, S.R. and Orr, J.E. (1997), 'Introduction: the neglected workforce', in Barley, S.R. and Orr, J.E. (eds.), *Between Craft and Science: Technical Work in U.S. Settings*, Ithaca, New York, Cornell University Press.
- Barnes, B. (2001), 'Practice as collective action', in Schatzki, T.R., Knorr Cetina, K. and von Savigny, E. (eds.), *The Practice Turn in Contemporary Theory*, London, Routledge.
- Barnett, R., Cook, D., Henderson, A. and Hurford, R. (2000), 'An association between senior medical staff workload and ICU mortality: do adequate staffing levels



- improve mortality? (abstract)', *Abstracts of the 25th Annual Scientific Meeting of the Australia and New Zealand Intensive Care Society*, 191.
- Bartley, M. (1990), 'Do we need a strong programme in medical sociology?' *Sociology of Health and Illness*, 12, 4, 371-90.
- Bartley, M., Davey Smith, G. and Blane, D. (1997), 'Vital comparisons: the social construction of mortality measurement', in Elston, M.A. (ed.), *The Sociology of Medical Science and Technology*, Oxford, Blackwell.
- Bastos, P.G., Knaus, W.A., Zimmerman, J.E., Magalhaes Jr., A., Sun, X. and Wagner, D.P. (1996), 'The importance of technology for achieving superior outcomes from intensive care. Brazil APACHE III Study Group', *Intensive Care Medicine*, 22, 7, 664-9.
- Becker, H.S. (1978), 'Arts and crafts', *American Journal of Sociology*, 83, 4, 862-89.
- Becker, H.S. and Geer, B. (1957), 'Participant observation and interviewing: a comparison', *Human Organization*, 16, 28-32.
- Becker, H.S., Geer, B., Hughes, E.C. and Strauss, A.L. (1992[1961]), *Boys in White: Student Culture in Medical School*, New Brunswick, Transaction Publishers.
- Beckmann, U., Baldwin, I., Hart, G. and Runciman, W. (1996), 'The Australian incident monitoring study in intensive care: AIMS-ICU. An analysis of the first year of reporting', *Anaesthesia and Intensive Care*, 24, 3, 320-9.
- Beckmann, U., Baldwin, I., Durie, M., Morrison, A. and Shaw, L. (1998), 'Problems associated with nursing staff shortage: an analysis of the first 3600 incident reports submitted to the Australian Incident Monitoring Study (AIMS-ICU)', *Anaesthesia and Intensive Care*, 26, 4, 396-400.
- Beeby, J. (2000a), 'Intensive care nurses' experiences of caring. Part 1: consideration of the concept of caring', *Intensive and Critical Care Nursing*, 16, 76-83.
- Beeby, J. (2000b), 'Intensive care nurses' experiences of caring. Part 2: research findings', *Intensive and Critical Care Nursing*, 16, 151-63.
- Bennett, A. (1997), *Writing Home*, London, Faber and Faber.
- Bennett, D. and Bion, J. (1999), 'ABC of intensive care: Organisation of intensive care', *British Medical Journal*, 318, 1468-70.
- Berg, M. (1992), 'The construction of medical disposals. Medical sociology and medical problem solving in clinical practice', *Sociology of Health and Illness*, 14, 2, 149-80.
- Berg, M. (1996), 'Practices of reading and writing: the constitutive role of the patient record in medical work', *Sociology of Health and Illness*, 18, 4, 499-524.



- Berg, M. (1997a), 'Problems and promises of the protocol', *Social Science and Medicine*, 44, 8, 1081-1088.
- Berg, M. (1997b), *Rationalizing Medical Work: Decision-Support Techniques and Medical Practices*, London, The MIT Press.
- Berg, M. (1998), 'Order(s) and disorder(s): of protocols and medical practices', in Berg, M. and Mol, A. (eds.), *Differences in Medicine: Unravelling Practices, techniques, and Bodies*, London, Duke University Press.
- Berwick, D.M. (1989), 'Continuous improvement as an ideal in health care', *New England Journal of Medicine*, 320, 1, 53-6.
- Bion, J. (1995), 'Rationing intensive care (editorial)', *British Medical Journal*, 310, 682-3.
- Black, N. (1997), 'Health services research: saviour or chimera?' *The Lancet*, 349, 1834-6.
- Black, N. and Thompson, E. (1993), 'Obstacles to medical audit: British doctors speak', *Social Science and Medicine*, 36, 7, 849-56.
- Bloor, M. (1976), 'Bishop Berkeley and the adenotonsillectomy enigma: an exploration of variation in the social construction of medical disposals', *Sociology*, 10, 43-61.
- Bloor, M. (1997), 'Addressing social problems through qualitative research', in Silverman, D. (ed.), *Qualitative Research: Theory, Method and Practice*, London, Sage.
- Bloor, M. (2001), 'The ethnography of health and medicine', in Atkinson, P., Coffey, A., Delamont, S., Lofland, J. and Lofland, L. (eds.), *Handbook of Ethnography*, London, Sage.
- Blumenthal, D. (1994), 'Making medical errors into 'medical treasures' (editorial)', *The Journal of the American Medical Association*, 272, 23, 1867-8.
- Blunt, M.C. and Burchett, K.R. (2000), 'Out-of-hours consultant cover and case-mix-adjusted mortality in intensive care', *Lancet*, 356, 735-6.
- Bosk, C.L. (1979), *Forgive and Remember: Managing Medical Failure*, London, University of Chicago Press.
- Boyd, O. and Grounds, M. (1994), 'Can standardized mortality ratio be used to compare quality of intensive care unit performance? (letter)', *Critical Care Medicine*, 22, 10, 1706-8.
- British Medical Association (2001), *Withholding and Withdrawing Life-prolonging medical treatment* (2nd Edition), London, BMJ Books.
- British Sociological Association (1992), 'Code of Ethics of the British Sociological



- Association', *Sociology*, 26, 4, 703-7.
- Brown, J. and Sullivan, G. (1989), 'Effect on ICU mortality of a full time critical care specialist', *Chest*, 96, 127-9.
- Bryman, A. (1984), 'The debate about quantitative and qualitative research: a question of method or epistemology?' *The British Journal of Sociology*, 35, 1, 75-92.
- Bryman, A. (1989), *Research Methods and Organization Studies*, London, Routledge.
- Burgess, R.G. (1984), *In the Field: an Introduction to Field Research*, London, Routledge.
- Butters, S. (1976), 'The logic-of-enquiry of participant observation', in Hall, S. and Jefferson, T. (eds.), *Resistance Through Rituals: Youth Subcultures in Post-War Britain*, London, Hutchinson.
- Campbell, D., Reid, J.M., Telfer, A.B.M. and Fitch, W. (1967), 'Four years of respiratory intensive care', *British Medical Journal*, 4, 255-9.
- Campbell, S.M., Roland, M.O. and Beutow, S.A. (2000), 'Defining quality of care', *Social Science and Medicine*, 51, 1611-25.
- Carmel, S. (2003), 'Clinical Leadership in the Intensive Care Unit', in Dopson, S. and Mark, A.L. (eds.), *Leading Health Care Organizations*, Basingstoke, Palgrave Macmillan.
- Carmel, S. and Rowan, K. (2001), 'Variation in intensive care unit outcomes: a search for the evidence on organizational factors', *Current Opinion in Critical Care*, 7, 284-96.
- Carson, S.S., Stocking, C., Podsadecki, T., Christenson, J., Pohlman, A., MacRae, S., Jordan, J., Humphrey, H., Siegler, M. and Hall, J. (1996), 'Effects of organizational change in the medical intensive care unit of a teaching hospital: a comparison of 'open' and 'closed' formats', *Journal of the American Medical Association*, 276, 4, 322-8.
- Casper, M. and Berg, M. (1995), 'Constructivist perspectives on medical work: medical practices and science and technology studies', *Science, Technology & Human Values*, 20, 4, 395-407.
- Chalmers, I. (1998), 'I would not want an albumin transfusion (letter)', *British Medical Journal*, 317, 885.
- Chassin, M.R. (1998), 'Is health care ready for six sigma quality?' *The Milbank Quarterly*, 76, 4, 565-91.
- Clegg, S.R. and Hardy, C. (1999[1996]), 'Introduction', in Clegg, S.R. and Hardy, C. (eds.), *Studying Organization: Theory & Method*, London, Sage.



- Collins, H.M. (2001), 'What is tacit knowledge?' in Schatzki, T.R., Knorr Cetina, K. and von Savigny, E. (eds.), *The Practice Turn in Contemporary Theory*, London, Routledge.
- Collins, H. and Pinch, T. (1993), *The Golem: What Everyone Should Know about Science*, Cambridge, Cambridge University Press.
- Collins, H. and Pinch, T. (1998), *The Golem at Large: What You Should Know about Technology*, Cambridge, Cambridge University Press.
- Cook, D.J., Giacomini, M., Johnson, N. and Willms, D. (1999), 'Life support in the intensive care unit: a qualitative investigation of technological purposes', *Canadian Medical Association Journal*, 161, 9, 1109-13.
- Cook, R.I., Render, M. and Woods, D.D. (2000), 'Gaps in the continuity of care and progress on patient safety', *British Medical Journal*, 320, 791-4.
- Cooper, G. (1999), 'The fear of unreason: science wars and sociology', *Sociological Research Online*, 4, 3,  
<<http://www.socresonline.org.uk/socresonline/4/3/cooper.html>>.
- Cooper, M.C. (1993), 'The intersection of technology and care in the ICU', *Advances in Nursing Science*, 15, 3, 23-32.
- Crozier (1964), *The Bureaucratic Phenomenon*, Chicago, The University of Chicago Press.
- Cuff, E., Sharrock, W. and Francis, D. (1990), *Perspectives in Sociology* (3rd Edition), London, Routledge.
- Daly, B.J., Phelps, C. and Rudy, E.B. (1991), 'A nurse-managed special care unit', *Journal of Nursing Administration*, 21, 7/8, 31-8.
- Davies, C. (2003), 'Some of our concepts are missing: reflections on the absence of a sociology of organisations in *Sociology of Health and Illness*', *Sociology of Health and Illness*, 25, Silver Anniversary Issue, 172-90.
- Davis, F. (1960), 'Uncertainty in medical prognosis clinical and functional', *American Journal of Sociology*, 66, 1, 41-7.
- de Leval, M.R. (1997), 'Human factors and surgical outcomes: a Cartesian dream (essay)', *The Lancet*, 349, 723-5.
- Delamont, S. and Atkinson, P. (2001), 'Doctoring uncertainty: mastering craft knowledge', *Social Studies of Science*, 31, 1, 87-107.
- Department of Health (1996), *Guidelines on Admission to and Discharge from Intensive Care and High Dependency Units*, London, Department of Health: NHS Executive.



- Department of Health (2000), *Comprehensive Critical Care: a Review of Adult Critical Care Services*, London, Department of Health.
- Dhond, G., Ridley, S. and Palmer, M. (1998), 'The impact of a high-dependency unit on the workload of an intensive care unit', *Anaesthesia*, 53, 841-7.
- DHSS (Department of Health and Social Security) (1983), 'NHS Management Inquiry Report (Griffiths Report)', London, HMSO.
- Dingwall, R. and Murray, T. (1983), 'Categorization in accident departments: "good" patients, "bad" patients and children', *Sociology of Health and Illness*, 5, 2, 127-48.
- Donabedian, A. (1974[1966]), 'Evaluating the quality of medical care', in Hasenfeld, Y. and English, R.A. (eds.), *Human Service Organizations: A Book of Readings*, Ann Arbor, University of Michigan Press.
- Donabedian, A. (1988), 'The quality of care: how can it be assessed?' *Journal of the American Medical Association*, 260, 12, 1743-8.
- Donaldson, L. (1999[1996]), 'The normal science of structural contingency theory', in Clegg, S.R. and Hardy, C. (eds.), *Studying Organization: Theory and Method*, London, Sage.
- Donchin, Y., Gopher, D., Olin, M., Badihi, Y., Biesky, M., Sprung, C., Pizov, R. and Cotev, S. (1995), 'A look into the nature and causes of human errors in the intensive care unit.' *Critical Care Medicine*, 23, 2, 294-300.
- Downey, G.W. (1972), 'ICU patients and staffs are subject to emotional stress', *Modern Hospital*, 118, 1, 88-91.
- Downie, R.S. and Macnaughton, J. (2000), *Clinical Judgement: Evidence in Practice*, Oxford, Oxford University Press.
- Draper, E.A. (1987), 'Effects of nurse/physician collaboration and nursing standards on ICU patients' outcomes', *Current Concepts in Nursing*, 1, 4, 2-9.
- Eddleston, J., Cheetham, E. and Nightingale, P. (1996), 'Clinical audit in intensive care', *British Journal of Intensive Care*, 6, 1, 16-20.
- Edwards, R.E. and Stockwell, M.A. (1996), 'The provision of high dependency beds does not substitute for inadequate intensive care provision (abstract)', *Intensive Care Medicine*, 22, Supp. 3, S301.
- Elston, M.A. (1991), 'The politics of professional power: medicine in a changing health service', in Gabe, J., Calnan, M. and Bury, M. (eds.), *The Sociology of the Health Service*, London, Routledge.
- Elston, M.A. (1997), 'Introduction: the sociology of medical science and technology', in



- Elston, M.A. (ed.), *The Sociology of Medical Science and Technology*, Blackwell, Oxford.
- Elston, M.A. (2003), Commentary, *Sociology of Health and Illness* 25th Anniversary Conference, London, LSHTM (25 April).
- Endacott, R. (2000), 'The Audit Commission Report (1) - creating a 'data collecting' culture in critical care', *Intensive and Critical Care Nursing*, 16, 63-5.
- Etzioni, A. (1975), *A Comparative Analysis of Complex Organizations: On Power, Involvement and Their Correlates* (2nd Edition), New York, The Free Press.
- Fairley, R.E. (1985), *Software Engineering Concepts*, London, McGraw-Hill.
- Farnell, R. (2000), 'In dialogue with 'posthuman' bodies: interview with Stelarc', in Featherstone, M. (ed.), *Body Modification*, London, Sage.
- Faulkner, A. (1997), "'Strange bedfellows' in the laboratory of the NHS? An analysis of the new science of health technology assessment in the United Kingdom', in Elston, M.A. (ed.), *The Sociology of Medical Science and Technology*, Blackwell, Oxford.
- Ferlie, E. (1997), 'Large-scale organizational and managerial change in health care: a review of the literature', *Journal of Health Services Research & Policy*, 2, 3, 180-9.
- Fielding, N. (1993), 'Ethnography', in Gilbert, G.N. (ed.), *Researching Social Life*, London, Sage.
- Fisher, M.M. (1997), 'Critical care. A specialty without frontiers', *Critical Care Clinics*, 13, 2, 235-43.
- Fleischman, P., Israel, J., Burr, W., Hoaken, P., Thaler, O., Zucker, H., Hanley, J., Ostow, M., Lieberman, L., Hunter, F., Pinsker, H., Blair, S., Reich, W., Wiedeman, G., Pattison, E. and Rosenhan, D. (1973), 'Psychiatric Diagnosis (Letters)', *Science*, 180, 356-69.
- Flood, A.B. (1994), 'The impact of organizational and managerial factors on the quality of care in health care organizations', *Medical Care Review*, 51, 4, 381-427.
- Flood, A.B. and Fennel, M.L. (1995), 'Through the lenses of organizational sociology: the role of organizational theory and research in conceptualizing and examining our health care system', *Journal of Health and Social Behavior*, 36, Extra Issue, 154-69.
- Fontes Pinto Noaves, M.A., Knobel, E., Bork, A.M., Pavao, O.F., Nogueira-Martins, L.A. and Ferraz, M.B. (1999), 'Stressors in the ICU: perception of the patient, relatives and health care team', *Intensive Care Medicine*, 25, 1421-6.



- Fox, N. (1993), 'Discourse, organisation and the surgical ward round', *Sociology of Health and Illness*, 15, 1, 16-42.
- Fox, N. (1994), 'Anaesthetists, the discourse on patient fitness and the organisation of surgery', *Sociology of Health and Illness*, 16, 1, 1-18.
- Fox, N.J. (2003), 'Practice-based evidence: towards collaborative and transgressive research', *Sociology*, 37, 1, 81-102.
- Fox, R.C. (1979[1957]), 'Training for uncertainty', *Essays in Medical Sociology: Journeys into the Field*, Chichester, John Wiley & Sons.
- Fox, R.C. (1980), 'The evolution of medical uncertainty', *Milbank Memorial Fund Quarterly*, 58, 1, 1-49.
- Freidson, E. (1963), 'Preface', in Freidson, E. (ed.), *The Hospital in Modern Society*, London, Collier-Macmillan.
- Freidson, E. (1988), 'Afterword, 1988', *Profession of Medicine: a Study of the Sociology of Applied Knowledge*, Chicago, University of Chicago Press.
- Freidson, E. (1988[1970]), *Profession of Medicine: a Study of the Sociology of Applied Knowledge*, Chicago, University of Chicago Press.
- Fulop, N., Allen, P., Clarke, P. and Black, N. (eds.) (2001a), *Studying the Organisation and Delivery of Health Services: Research Methods*, Routledge, London.
- Fulop, N., Allen, P., Clarke, P. and Black, N. (2001b), 'Issues in studying the organisation and delivery of health services', in Fulop, N., Allen, P., Clarke, P. and Black, N. (eds.), *Studying the Organisation and Delivery of Health Services: Research Methods*, London, Routledge.
- Gaba, D.M. (2000), 'Anaesthesiology as a model for patient safety in health care', *British Medical Journal*, 320, 785-8.
- Gage, N.L. (1993[1991]), 'The obviousness of social and educational research results', in Hammersley, M. (ed.), *Social Research: Philosophy, Politics and Practice*, London, Sage.
- Garfinkel, H. (1967), *Studies in Ethnomethodology*, Cambridge, Polity Press.
- Ghorra, S., Reinert, S.E., Cioffi, W., Buczko, G. and Simms, H.H. (1999), 'Analysis of the effect of conversion from open to closed surgical intensive care unit', *Annals of Surgery*, 229, 2, 163-71.
- Gibbons, M., Limoges, C., Nowotny, H., Schwartman, S., Scott, P. and Trow, M. (1994), *The New Production of Knowledge*, London, Sage.
- Gilbert, G.N. and Mulkay, M. (1984), *Opening Pandora's Box: a Sociological Analysis of Scientists' Discourse*, Cambridge, Cambridge University Press.



- Giraud, T., Dhainaut, J.-F., Vaxelaire, J.-F., Joseph, T., Journois, D., Bleichner, G., Sollet, J.-P., Chevret, S. and Monsallier, J.-F. (1993), 'Iatrogenic complications in adult intensive care units: a prospective two-center study', *Critical Care Medicine*, 21, 1, 40-51.
- Girotti, M.J., Garrick, C., Tierney, M.G., Chesnick, K. and Brown, S.J. (1987), 'Medication administration errors in an adult intensive care unit', *Heart & Lung*, 16, 4, 449-53.
- Glaser, B.G. and Strauss, A.L. (1967), *The Discovery of Grounded Theory: Strategies for Qualitative Research*, London, Weidenfeld and Nicolson.
- Goffman, E. (1968[1961]), *Asylums: Essays on the Social Situation of Mental Patients and Other Inmates*, London, Penguin Books.
- Goffman, E. (1983), 'The interaction order: American Sociological Association 1982 presidential address', *American Sociological Review*, 48, February, 1-17.
- Goldfrad, C. and Rowan, K. (2000a), 'Consequences of discharges from intensive care at night', *The Lancet*, 355, 1138-42.
- Goldfrad, C. and Rowan, K. (2000b), 'Does "practice make perfect"? Volume of work and outcome in intensive care (abstract)', *Journal of Epidemiology and Community Health*, A9.
- Goldstein, H. and Spiegelhalter, D.J. (1996), 'League tables and their limitations: statistical issues in comparisons of institutional performance', *Journal of the Royal Statistical Society Series A*, 159, Part 3, 385-443.
- Goodfellow, A., Varnam, R., Rees, D. and Shelly, M. (1997), 'Staff stress on the intensive care unit: a comparison of doctors and nurses', *Anaesthesia*, 52, 11, 1037-41.
- Gosling, P. (1998), 'Newer synthetic colloids should not be abandoned (letter)', *British Medical Journal*, 317, 277.
- Green, J. (1998), Review of: Strauss *et al.*, *Social Organization of Medical Work*, *Social Science and Medicine*, 47, 2145-6.
- Green, J. and Armstrong, D. (1993), 'Controlling the 'bed state': negotiating hospital organisation', *Sociology of Health and Illness*, 15, 3, 339-52.
- Green, J. and Armstrong, D. (1995), 'Bed managers and the crisis in emergency admissions', *The Sociological Review*, 43, 4, 743-64.
- Griffiths, L. (2003), 'Making connections: studies of the social organisation of healthcare', *Sociology of Health and Illness*, 25, Silver Anniversary Issue, 155-71.
- Groen, M.A.H. (1995), 'Technology, Work and Organisation: a Study of the Nursing



- Process in Intensive Care Units', *Ph.D. thesis*, University of Limburg, Maastricht, The Netherlands.
- Guillemin, J.H. and Holmstrom, L.L. (1986), *Mixed Blessings: Intensive Care for Newborns*, Oxford, Oxford University Press.
- Gunning, K. (2000), 'Critical incident reporting in intensive care (editorial)', *Intensive Care Medicine*, 26, 1, 8-10.
- Gunning, K. and Rowan, K. (1999), 'ABC of intensive care: Outcome data and scoring systems', *British Medical Journal*, 319, 241-4.
- Guntupalli, K.K. and Fromm, R.E. (1996), 'Burnout in the internist-intensivist', *Intensive Care Medicine*, 22, 625-30.
- Hammersley, M. (1992), *What's Wrong with Ethnography?*, London, Routledge.
- Hammersley, M. (2000), 'Varieties of social research: a typology', *International Journal of Social Research Methodology*, 3, 3, 221-9.
- Hammersley, M. and Atkinson, P. (1995), *Ethnography: Principles in Practice* (2nd Edition), London, Routledge.
- Hanson III, C.W., Deutschman, C.S., Anderson III, H.L., Reilly, P.M., Behringer, E.C., Schwab, C.W. and Price, J. (1999), 'Effects of an organized critical care service on outcomes and resource utilization: a cohort study', *Critical Care Medicine*, 27, 2, 270-4.
- Happ, M.B. (2000), 'Interpretation of nonvocal behavior and the meaning of voicelessness in critical care', *Social Science and Medicine*, 50, 9, 1247-55.
- Haraway, D. (1991), 'A cyborg manifesto: science, technology and socialist-feminism in the late twentieth century', *Simians, Cyborgs and Women: the Reinvention of Nature*, New York, Routledge.
- Hart, G.K., Baldwin, I., Gutteridge, G. and Ford, J. (1994), 'Adverse incident reporting in intensive care', *Anaesthesia and Intensive Care*, 22, 5, 556-61.
- Harvey, J. (1992), 'Behind the Medical Mask: Medical Technology and Medical Power', *Ph.D. thesis*, University of Warwick, UK.
- Harvey, J. (1995), 'Upskilling and the intensification of work: the 'extended role' in intensive care nursing and midwifery', *Sociological Review*, 43, 4, 765-81.
- Harvey, J. (1996), 'Achieving the indeterminate: accomplishing degrees of certainty in life and death situations', *Sociological Review*, 44, 1, 78-98.
- Harvey, J. (1997), 'The technological regulation of death: with reference to the technological regulation of birth', *Sociology*, 31, 4, 719-36.
- Heath, C., Luff, P. and Sanchez Svensson, M. (2003), 'Technology and medical



- practice', *Sociology of Health and Illness*, 25, Silver Anniversary Issue, 75-96.
- Helmreich, R. (2000), 'On error management: lessons from aviation', *British Medical Journal*, 320, 781-5.
- Heskins, F.M. (1997), 'Exploring dichotomies of caring, gender and technology in intensive care nursing: a qualitative approach', *Intensive and Critical Care Nursing*, 13, 65-71.
- Hilberman, M. (1975), 'The evolution of intensive care units', *Critical Care Medicine*, 3, 4, 159-65.
- Hornsby-Smith, M. (1993), 'Gaining access', in Gilbert, G.N. (ed.), *Researching Social Life*, London, Sage.
- Hudak, C.M., Gallo, B.M. and Morton, P.G. (eds.) (1998), *Critical Care Nursing: a Holistic Approach*, Lippincott, Philadelphia.
- Hughes, D. (1980), 'Lay Assessment of Clinical Seriousness: Practical Decision-making by Non-medical Staff in a Hospital Casualty Department', *Ph.D. thesis*, University College of Swansea, Wales, UK.
- Hughes, D. (1988), 'When nurse knows best: some aspects of nurse/doctor interaction in a casualty department', *Sociology of Health and Illness*, 10, 1, 1-21.
- Hughes, E.C. (1958), *Men and Their Work*, Westport, Greenwood Press.
- Hutchby, I. (2001), 'Technologies, texts and affordances', *Sociology*, 35, 2, 441-56.
- ICS (1997), *Standards for Intensive Care Units*, London, Intensive Care Society.
- ICS (2002), *Guidelines for the Introduction of Outreach Services*, London, Intensive Care Society.
- ICS (2003), *Evolution of Intensive Care in the UK*, London, Intensive Care Society.
- James, N. (1992), 'Care, work and carework: a synthesis?' in Robinson, J., Gray, A. and Elkan, R. (eds.), *Policy Issues in Nursing*, Milton Keynes, Open University Press.
- Jamous, H. and Peloille, B. (1970), 'Changes in the French university-hospital system', in Jackson, J.A. (ed.), *Professions and Professionalization*, Cambridge, Cambridge University Press.
- Jeffery, R. (1979), 'Normal rubbish: deviant patients in casualty departments', *Sociology of Health and Illness*, 1, 1, 90-107.
- Jennett, B. (1984a), 'Inappropriate use of intensive care (editorial)', *British Medical Journal*, 289, 1709-11.
- Jennett, B. (1984b), *High Technology Medicine: Benefits and Burdens*, London, The Nuffield Provincial Hospitals Trust.
- Jones, J. and Rowan, K. (1995), 'Is there a relationship between the volume of work



- carried out in intensive care and its outcome?' *International Journal of Technology Assessment in Health Care*, 11, 4, 762-9.
- Kalb, P.E. and Miller, D.H. (1989), 'Utilization strategies for intensive care units', *Journal of the American Medical Association*, 261, 16, 2389-95.
- Karp, D.A. (1999), 'Social science, progress, and the ethnographer's craft', *Journal of Contemporary Ethnography*, 28, 6, 597-609.
- Keating, P. (2000), *Bluff Your Way in Doctoring* (2nd Edition), London, Oval Books.
- Kelley, M. (1988), 'Critical care medicine - a new specialty?' *The New England Journal of Medicine*, 318, 24, 1613-7.
- Kelley, M.A., Nachamkin, D.C., Escarce, J.J., Goldfarb, N.I., Lancken, P.N. and Williams, S.V. (1990), 'Expansion of the medical intensive care unit: clinical consequences in a large urban hospital', *Critical Care Medicine*, 18, 9, 945-9.
- Kern, H. and Kox, W.J. (1999), 'Impact of standard procedures and clinical standards on cost-effectiveness and intensive care unit performance in adult patients after cardiac surgery', *Intensive Care Medicine*, 25, 1367-1373.
- King's Fund (1989), *Intensive Care in the United Kingdom: Report from the King's Fund Panel*, London, King's Fund.
- Knaus, W.A., Draper, E.A., Wagner, D.P. and Zimmerman, J.E. (1986), 'An evaluation of outcome from intensive care in major medical centers', *Annals of Internal Medicine*, 104, 410-8.
- Knaus, W.A., Wagner, D.P., Zimmerman, J.E. and Draper, E.A. (1993), 'Variations in mortality and length of stay in intensive care units', *Annals of Internal Medicine*, 118, 10, 753-61.
- Kollef, M.H., Shapiro, S.D., Silver, P., St. John, R.E., Prentice, D., Sauer, S., Ahrens, T.S., Shannon, W. and Baker Clinkscale, D. (1997), 'A randomized, controlled trial of protocol-directed versus physician-directed weaning from mechanical ventilation', *Critical Care Medicine*, 25, 4, 567-74.
- Laffel, G. and Blumenthal, D. (1989), 'The case for using industrial quality management science in health care organizations', *Journal of the American Medical Association*, 262, 20, 2869-73.
- Lamb, F., Rhodes, A. and Bennet, E. (1997), 'Can intensive care units be compared?' in Vincent, J.-L. (ed.), *Yearbook of Intensive Care and Emergency Medicine*, London, Springer.
- Lapsley, I. and Melia, K.M. (2001), 'Clinical action and financial constraints: the limits to rationing intensive care', *Sociology of Health and Illness*, 23, 5, 729-46.



- Latour, B. (1987), *Science in Action: How to Follow Scientists and Engineers through Society*, Cambridge, Mass., Harvard University Press.
- Latour, B. (1993[1991]), *We Have Never Been Modern*, London, Harvester Wheatsheaf.
- Latour, B. (1999a), 'On recalling ANT', in Law, J. and Hassard, J. (eds.), *Actor Network Theory and After*, Oxford, Blackwell.
- Latour, B. (1999b), *Pandora's Hope: Essays on the Reality of Science Studies*, London, Harvard University Press.
- Latour, B. and Woolgar, S. (1986), *Laboratory Life: the Construction of Scientific Facts* (2nd Edition), Chichester, Princeton University Press.
- Law, J. (1992), 'Notes on the theory of the actor-network: ordering, strategy, and heterogeneity', *Systems Practice*, 5, 4, 379-393.
- Leape, L.L. (1999[1994]), 'Error in Medicine', in Rosenthal, M.M., Mulcahy, L. and Lloyd-Bostock, S. (eds.), *Medical Mishaps: Pieces of the Puzzle*, Buckingham, Open University Press.
- Leatt, P. and Schneck, R. (1981), 'Nursing subunit technology: a replication', *Administrative Science Quarterly*, 26, 225-36.
- Lee, A., Bishop, G., Hillman, K.M. and Daffurn, K. (1995), 'The Medical Emergency Team', *Anaesthesia and Intensive Care*, 23, 183-6.
- Lee, D.J. (1981), 'Skill, craft and class: a theoretical critique and a critical case', *Sociology*, 15, 1, 56-78.
- Levels of Evidence* (2002), March, Evidence-based On-call, <<http://www.eboncall.co.uk/content/levels.html>>.
- Li, T.C., Phillips, M.C., Shaw, L., Cook, E.F., Natanson, C. and Goldman, L. (1984), 'On-site physician staffing in a community hospital intensive care unit. Impact on test and procedure use and on patient outcome', *Journal of the American Medical Association*, 252, 15, 2023-7.
- Light, D. (1979), 'Uncertainty and control in professional training', *Journal of Health and Social Behavior*, 20, 310-22.
- Luft, H.S. and Hunt, S.S. (1986), 'Evaluating individual hospital quality through outcome statistics', *Journal of the American Medical Association*, 255, 20, 2780-4.
- Lynch, M. (2000), 'Against reflexivity as an academic virtue and source of privileged knowledge', *Theory, Culture & Society*, 17, 3, 26-54.
- Lynch, M. (2001), 'Ethnomethodology and the logic of practice', in Schatzki, T.R., Knorr Cetina, K. and von Savigny, E. (eds.), *The Practice Turn in Contemporary*



*Theory*, London, Routledge.

- MacIntyre, N. and Popper, K. (1983), 'The critical attitude in medicine: the need for a new ethics', *British Medical Journal*, 287, 1919-23.
- Mallick, R., Strosberg, M., Lambrinos, J. and Groeger, J.S. (1995), 'The intensive care unit medical director as manager. Impact on performance', *Medical Care*, 33, 6, 611-24.
- Manthous, C.A., Amoateng-Adjepong, Y., Al Kharrat, T., Jacob, B., Alnuaimat, H.M., Chatila, W. and Hall, J.B. (1997), 'Effects of a medical intensivist on patient care in a community teaching hospital', *Mayo Clinic Proceedings*, 72, 5, 391-9.
- Marini, C.P., Nathan, I.M., Ritter, G., Rivera, L., Jurkiewicz, A. and Cohen, J.R. (1995), 'The impact of full-time surgical intensivists on ICU utilization and mortality (abstract)', *Critical Care Medicine*, 23, 1, suppl., A235.
- Marx, W.H., DeMaintenon, N.L., Mooney, K.F., Mascia, M.L., Medicis, J., Franklin, P.D., Sivak, E. and Rotello, L. (1999), 'Cost reduction and outcome improvement in the intensive care unit', *Journal of Trauma*, 46, 4, 625-30.
- May, C. (1990), 'Research on nurse-patient relationships: problems of theory, problems of practice', *Journal of Advanced Nursing*, 15, 307-15.
- May, C. (1992), 'Individual care? Power and subjectivity in therapeutic relationships', *Sociology*, 26, 4, 589-602.
- May, C. and Ellis, N.T. (2001), 'When protocols fail: technical evaluation, biomedical knowledge, and the social production of 'facts' about a telemedicine clinic', *Social Science and Medicine*, 53, 989-1002.
- May, C. and Fleming, C. (1997), 'The professional imagination: narrative and the symbolic boundaries between medicine and nursing', *Journal of Advanced Nursing*, 25, 1094-1100.
- May, C., Gask, L., Atkinson, T., Ellis, N., Mair, F. and Esmail, A. (2001), 'Resisting and promoting new technologies in clinical practice: the case of telepsychiatry.' *Social Science and Medicine*, 52, 12, 1889-901.
- Mayo, E. (1990[1949]), 'Hawthorne and the Western Electric Company', in Pugh, D. (ed.), *Organization Theory: Selected Readings* (3rd Edition), London, Penguin.
- McAlpine, L., Cohen, I.L. and Truckenbrod, A. (1997), 'Reducing resource consumption through work redesign in a surgical intensive care unit: a multidisciplinary, protocol-based Progressive Care Area', *Heart and Lung*, 26, 4, 329-34.
- McGloin, H., Adam, S.K. and Singer, M. (1999), 'Unexpected deaths and referrals to



- intensive care of patients on general wards. Are some cases potentially avoidable?' *Journal of the Royal College of Physicians of London*, 33, 3, 255-9.
- McQuillan, P., Pilkington, S., Allan, A., Taylor, B., Short, A., Morgan, G., Nielsen, M., Barrett, D., Smith, G. and Collins, C.H. (1998), 'Confidential inquiry into quality of care before admission to intensive care', *British Medical Journal*, 316, 1853-8.
- Mehari, S.M., Havill, J.H. and Montgomery, C. (1997), 'A written guideline implementation can lead to reductions in laboratory testing in an intensive care unit', *Anaesthesia and Intensive Care*, 25, 1, 33-7.
- Melia, K.M. (1987), *Learning and Working: the Occupational Socialization of Nurses*, London, Tavistock.
- Melia, K.M. (2001), 'Ethical issues and the importance of consensus for the intensive care team', *Social Science and Medicine*, 53, 707-19.
- Metcalfe, A. and McPherson, K. (1995), *Study of the Provision of Intensive Care in England, 1993*, London, Department of Health.
- Metcalfe, M.A., Sloggett, A. and McPherson, K. (1997), 'Mortality among appropriately referred patients refused admission to intensive care', *Lancet*, 350, 7-12.
- Miller, A. (1985), 'The relationship between nursing theory and nursing practice', *Journal of Advanced Nursing*, 10, 417-24.
- Mills, C.W. (1959), *The Sociological Imagination*, Oxford, Oxford University Press.
- Mintzberg, H. (1983), *Structure in Fives: Designing Effective Organisations*, Englewood Cliffs, Prentice Hall.
- Mitchell, I.A. and Kussy, J. (2000), 'Collaborative practice in the intensive care unit: more than just words (abstract)', *Abstracts of the 25th Annual Scientific Meeting of the Australia and New Zealand Intensive Care Society*, 25, 196.
- Mitchell, J.C. (1983), 'Case and situation analysis', *Sociological Review*, 31, 187-211.
- Mitchell, P.H. and Shortell, S.M. (1997), 'Adverse outcomes and variations in organization of care delivery', *Medical Care*, 35, Supplement, NS19-NS32.
- Mitchell, P.H., Shannon, S.E., Cain, K.C. and Hegyvary, S.T. (1996), 'Critical care outcomes: linking structures, processes, and organizational and clinical outcomes', *American Journal of Critical Care*, 5, 5, 353-63.
- Mizock, B.A. and Weil, M.H. (1993), 'Introduction: history and destiny of critical care medicine', in Carlson, R. and Geheb, M. (eds.), *Principles and Practice of Medical and Intensive Care*, Philadelphia, WB Saunders.
- Mol, A. and Berg, M. (1998), 'Differences in medicine: an introduction', in Berg, M.



- and Mol, A. (eds.), *Differences in Medicine: Unravelling Practices, techniques, and Bodies*, London, Duke University Press.
- Morgan, M. (1997), 'The doctor-patient relationship', in Scambler, G. (ed.), *Sociology as Applied to Medicine* (4th Edition), London, W.B. Saunders.
- Mourouga, P., Goldfrad, C. and Rowan, K. (2000), 'Does it fit? Is it good? Assessment of scoring systems', *Current Opinion in Critical Care*, 6, 176-80.
- Multz, A.S., Chalfin, D.B., Samson, I.M., Dantzker, D.R., Fein, A.M., Steinberg, H.N., Niederman, M.S. and Scharf, S.M. (1998), 'A "closed" medical intensive care unit (MICU) improves resource utilization when compared with an "open" MICU', *American Journal of Respiratory and Critical Care Medicine*, 157, 5 Pt 1, 1468-73.
- Murphy, E. (2001), 'Micro-level qualitative research', in Fulop, N., Allen, P., Clarke, A. and Black, N. (eds.), *Studying the Organisation and Delivery of Health Services: Research Methods*, London, Routledge.
- Murphy, E. and Dingwall, R. (2001), 'The ethics of ethnography', in Atkinson, P., Coffey, A., Delamont, S., Lofland, J. and Lofland, L. (eds.), *Handbook of Ethnography*, London, Sage.
- Murphy, E., Dingwall, R., Greatbatch, D., Parker, S. and Watson, P. (1998), 'Qualitative Research Methods in Health Technology Assessment: a Review of the Literature', *Health Technology Assessment*, 2, 16.
- Nap, R., Alvaro, M.S., Fidler, V. and Miranda, D.R. (2000), 'Collaborative practice and clinical outcomes in the ICU (abstract)', *Critical Care*, 4, Supp 1, S126.
- Overton, P., Schneck, R. and Hazlett, C. (1977), 'An empirical study of the technology of nursing subunits', *Administrative Science Quarterly*, 22, 203-19.
- Parker, M. (2000), 'The sociology of organizations and the organization of sociology: some reflections on the making of a division of labour', *The Sociological Review*, 48, 1, 125-46.
- Parsons, T. (1951), *The Social System*, London, Routledge & Kegan Paul.
- Parsons, T. (1974[1957]), 'The mental hospital as a type of organisation', in Hasenfeld, Y. and English, R.A. (eds.), *Human Service Organizations: A Book of Readings*, Ann Arbor, University of Michigan Press.
- Patton, M.Q. (1990), *Qualitative Evaluation and Research Methods* (2nd Edition), London, Sage.
- Pels, D. (2000), 'Reflexivity: one step up', *Theory, Culture & Society*, 17, 3, 1-25.
- Perrow, C. (1974[1961]), 'The analysis of goals in complex organisations', in



- Hasenfeld, Y. and English, R.A. (eds.), *Human Service Organizations: A Book of Readings*, Ann Arbor, University of Michigan Press.
- Petros, A., Schindler, M., Pierce, C., Jacobe, S. and Mok, Q. (1998), 'Evidence needs to be shown in paediatrics (letter)', *British Medical Journal*, 317, 882.
- Pezzi, A., Assi, E., Latis, G., Minuto, A., Noto, A. and Iapichino, G. (1997), 'The effects of management on an Intensive Care Unit performances (abstract)', *Intensive Care Medicine*, 23, Supp. 1, S159.
- Pilgrim, D. and May, C. (1998), 'Social scientists and the British National Health Service', *Social Sciences in Health*, 4, 1, 42-54.
- Pilon, C., Leathley, M., London, R., McLean, S., Phang, P., Priestley, R., Rosenberg, F., Singer, J., Anis, A. and Dodek, P. (1997), 'Practice guidelines for arterial blood gas measurement in the intensive care unit decreases numbers and increases appropriateness of tests', *Critical Care Medicine*, 25, 1308-1313.
- Pinch, T.J. (1981), 'The sun-set: the presentation of certainty in scientific life', *Social Studies of Science*, 11, 1, 131-58.
- Pinch, T.J., Collins, H.M. and Carbone, L. (1997), 'Cutting up skills: estimating difficulty as an element of surgical and other abilities', in Barley, S. and Orr, J. (eds.), *Between Craft and Science: Technical Work in U.S. Settings*, Ithaca, Cornell University Press.
- Pollack, M.M., Katz, R.W., Ruttiman, U.E. and Getson, P.R. (1988), 'Improving the outcome and efficiency of intensive care: the impact of an intensivist', *Critical Care Medicine*, 16, 1, 11-7.
- Pollack, M.M., Cuerdon, T.T., Patel, K.M., Ruttiman, U.E., Getson, P.R. and Lovetown, M. (1994), 'Impact of quality-of-care factors on pediatric intensive care unit mortality', *Journal of the American Medical Association*, 272, 12, 941-6.
- Pollack, M.M., Koch, M., Bartel, D. and Nih, D. (1999), 'Good ICU management makes a difference: managerial practices and organizational processes are related to severe morbidity (abstract)', *Critical Care Medicine*, 27, 12 - supplement, A43.
- Pollner, M. and Emerson, R.M. (2001), 'Ethnomethodology and ethnography', in Atkinson, P., Coffey, A., Delamont, S., Lofland, J. and Lofland, L. (eds.), *Handbook of Ethnography*, London, Sage.
- Pope, C. (1991), 'Trouble in store: some thoughts on the management of waiting lists', *Sociology of Health and Illness*, 13, 2, 193-212.
- Pope, C. (2002), 'Contingency in everyday surgical work', *Sociology of Health and Illness*, 24, 4, 369-84.



- Porter, S. (1991), 'A participant observation study of power relations between nurses and doctors in a general hospital', *Journal of Advanced Nursing*, 16, 728-35.
- Porter, S. (1992a), 'The poverty of professionalization: a critical analysis of strategies for the occupational advancement of nursing', *Journal of Advanced Nursing*, 17, 720-6.
- Porter, S. (1992b), 'Women in a women's job: the gendered experience of nurses', *Sociology of Health and Illness*, 14, 4, 510-27.
- Porter, S. (1993), 'Critical realist ethnography: the case of racism and professionalism in a medical setting', *Sociology*, 27, 4, 591-609.
- Power, M. (1997), *The Audit Society: Rituals of Verification*, Oxford, Oxford University Press.
- Pronovost, P.J., Jenckes, M.W., Dorman, T., Garrett, E., Breslow, M.J., Rosenfeld, B.A., Lipsett, P.A. and Bass, E. (1999), 'Organizational characteristics of intensive care units related to outcomes of abdominal aortic surgery', *Journal of the American Medical Association*, 281, 14, 1310-7.
- Pronovost, P.J., Miller, M., Dorman, T., Berenholtz, S.M. and Rubin, H. (2001), 'Developing and implementing measures of quality of care in the intensive care unit', *Current Opinion in Critical Care*, 7, 297-303.
- Pronovost, P.J., Angus, D., Dorman, T., Robinson, K., Dremisizov, T. and Young, T. (2002), 'Physician staffing patterns and clinical outcomes in critically ill patients: a systematic review', *Journal of the American Medical Association*, 288, 17, 2151-62.
- Prout, A. (1996), 'Actor-network theory, technology and medical sociology: an illustrative analysis of the metered dose inhaler', *Sociology of Health and Illness*, 18, 2, 198-219.
- Purkis, M.E. (1999), 'Embracing technology: an exploration of the effects of writing nursing', *Nursing Inquiry*, 6, 3, 147-56.
- Rafkin, H. and Hoyt, J. (1996), 'Twenty-four hour physician coverage reduces mortality and length of stay in the ICU (abstract)', *Intensive Care Medicine*, 22, Suppl. 3, S302.
- Reckman, B. (1979), 'Carpentry: the craft and trade', in Zimbalist, A. (ed.), *Case Studies on the Labour Process*, London, Monthly Review Press.
- Reckwitz, A. (2002), 'The status of the "material" in theories of culture: from "social structure" to "artefacts"', *Journal for the Theory of Social Behaviour*, 32, 2, 195-217.



- Reed, M.I. (1992), *The Sociology of Organizations: Themes, Perspectives and Prospects*, London, Harvester Wheatsleaf.
- Reed, M.I. (1999[1996]), 'Organizational theorizing: a historically contested terrain', in Clegg, S.R. and Hardy, C. (eds.), *Studying Organization: Theory & Method*, London, Sage.
- Reeves, S. and Lewin, S. (2003), 'Hospital-based interprofessional collaboration: strategies and meanings', *submitted*.
- Reinersten, J.L. (2000), 'Let's talk about error (editorial)', *British Medical Journal*, 320, 730.
- Reis Miranda, D., Moreno, R. and Iapichino, G. (1997), 'Nine equivalents of nursing manpower use score (NEMS)', *Intensive Care Medicine*, 23, 760-765.
- Reis Miranda, D., Ryan, D., Schaufeli, W. and Fidler, V. (eds.) (1998), *Organisation and Management of Intensive Care: a Prospective Study in 12 European Countries*, Springer, Berlin.
- Reynolds, H.N., Haupt, M.T., Thill Baharozian, M.C. and Carlson, R.W. (1988), 'Impact of critical care physician staffing on patients with septic shock in a university hospital medical intensive care unit', *Journal of the American Medical Association*, 260, 23, 3446-50.
- Richman, J. (2000), 'Coming out of intensive care crazy: dreams of affliction', *Qualitative Health Research*, 10, 1, 84-102.
- Rier, D.A. (2000), 'The missing voice of the critically ill: a medical sociologist's first-person account', *Sociology of Health and Illness*, 22, 1, 68-93.
- Roberts, D.E., Bell, D.D., Ostryzniuk, T., Dobson, K., Oppenheimer, L., Martens, D., Honcharik, N., Cramp, H., Loewen, E., Bodnar, S., Guenther, A., Pronger, L., Roberts, E. and McEwen, T. (1993), 'Eliminating needless testing in intensive care - an information-based team management approach', *Critical Care Medicine*, 21, 10, 1452-8.
- Roberts, I. and Cochrane Injuries Group Albumin Reviewers (1998), 'Human albumin administration in critically ill patients: systematic review of randomised controlled trials', *British Medical Journal*, 317, 235-40.
- Robillard, A.B. (1999), *The Meaning of a Disability: the Lived Experience of Paralysis*, Philadelphia, Temple.
- Rochlin, G. (2000), 'An ecological approach to the study of highly-reliable organizations (seminar)', London, LSHTM.
- Rosenfeld, B., Dorman, T., Pronovost, P., Jenckes, M., Rubin, H., Anderson, G. and



- Breslow, M. (1999), 'Remote management improves ICU outcomes (abstract)', *Critical Care Medicine*, 27, 1, suppl., A153.
- Rosenhan, D. (1973), 'On being sane in insane places', *Science*, 179, 250-8.
- Roth, J.A. (1957), 'Ritual and magic in the control of contagion', *American Sociological Review*, 22, 310-4.
- Roth, J.A. (1963), 'Information and the control of treatment in tuberculosis hospitals', in Freidson, E. (ed.), *The Hospital in Modern Society*, London, Collier-Macmillan.
- Roth, J.A. (1974[1972]), 'Some contingencies of the moral evaluation and control of clientele: the case of the hospital emergency service', in Hasenfeld, Y. and English, R.A. (eds.), *Human Service Organizations: A Book of Readings*, Ann Arbor, University of Michigan Press.
- Rotondi, A.J., Angus, D.C., Sirio, C.A. and Pinsky, M.R. (2000), 'Assessing intensive care unit performance: a new conceptual framework', *Current Opinion in Critical Care*, 6, 155-7.
- Rowan, K.M. (1992), 'Outcome Comparisons of Intensive Care Units in Great Britain and Ireland Using the APACHE II Method', *D.Phil. thesis*, University of Oxford, UK.
- Rowan, K.M. (1997), 'Risk adjustment for intensive care outcomes', in Goldhill, D. and Withington, S. (eds.), *Textbook of Intensive Care*, London, Chapman & Hall.
- Rowan, K.M., Kerr, J.H., Major, E., McPherson, K., Short, A. and Vessey, M.P. (1993), 'Intensive Care Society's APACHE II study in Britain and Ireland - II: outcome comparisons of intensive care units after adjustment for case mix by the APACHE II method', *British Medical Journal*, 307, 977-81.
- Rowland, S., Byron, C., Furedi, F., Padfield, N. and Smyth, T. (1998), 'Turning academics into teachers?' *Teaching in Higher Education*, 3, 2, 133-41.
- Rudy, E.B., Daly, B.J., Douglas, S., Montenegro, H.D., Song, R. and Dyer, M.A. (1995), 'Patient outcomes for the chronically critically ill: special care unit versus intensive care unit', *Nursing Research*, 44, 6, 324-31.
- Sackett, D., Rosenberg, W., Gray, J., Haynes, R. and Richardson, W. (1996), 'Evidence based medicine: what it is and what it isn't', *British Medical Journal*, 312, 71-2.
- Safar, P. and Grenvik, A. (1977), 'Organization and physician education in critical care medicine', *Anesthesiology*, 47, 82-95.
- Sagie, A. and Krausz, M. (2003), 'What aspects of the job have most effect on nurses?' *Human Resource Management Journal*, 13, 1, 46-62.



- Sanders, G. and van der Veen, J. (1998), 'Culture in ICUs', in Reis Miranda, D., Ryan, D., Schaufeli, W. and Fidler, V. (eds.), *Organisation and Management of Intensive Care: A Prospective Study in 12 European Countries*, Berlin, Springer.
- Schaefer, H., Helmreich, R. and Scheidegger, D. (1994), 'Human factors and safety in emergency medicine', *Resuscitation*, 28, 221-5.
- Schatzki, T.R. (2001), 'Introduction: practice theory', in Schatzki, T.R., Knorr Cetina, K. and von Savigny, E. (eds.), *The Practice Turn in Contemporary Theory*, London, Routledge.
- Schatzki, T.R., Knorr Cetina, K. and von Savigny, E. (eds.) (2001), *The Practice Turn in Contemporary Theory*, Routledge, London.
- Schaufeli, W. and Le Blanc, P. (1998), 'Personnel', in Reis Miranda, D., Ryan, D., Schaufeli, W. and Fidler, V. (eds.), *Organisation and Management of Intensive Care: A Prospective Study in 12 European Countries*, Berlin, Springer.
- Scheper-Hughes, N. (2000), 'Ire in Ireland', *Ethnography*, 1, 1, 117-140.
- Schierhout, G. and Roberts, I. (1998), 'Fluid resuscitation with colloid or crystalloid solutions in critically ill patients: a systematic review of randomised trials', *British Medical Journal*, 316, 961-4.
- Schofield, J.W. (1993[1989]), 'Increasing the generalizability of qualitative research', in Hammersley, M. (ed.), *Social Research: Philosophy, Politics and Practice*, London, Sage.
- Schon, D.A. (1988[1983]), 'From technical rationality to reflection-in-action', in Dowie, J. and Elstein, A. (eds.), *Professional Judgement: A Reader in Clinical Decision Making*, Cambridge, Cambridge University Press.
- Schwartzman, H. (1993), *Ethnography in Organizations*, London, Sage.
- Seale, C. (1999), *The Quality of Qualitative Research*, London, Sage.
- Sexton, J.B., Thomas, E.J. and Helmreich, R.L. (2000), 'Error, stress, and teamwork in medicine and aviation: cross-sectional surveys', *British Medical Journal*, 320, 745-9.
- Sexton, J.B., Brady, A., Vella, K., Boyden, J. and Rowan, K. (2003), 'Teamwork and safety attitudes among staff in critical care units and their relationship to patient mortality', *submitted*.
- Seymour, J.E. (2000), 'Negotiating natural death in intensive care', *Social Science and Medicine*, 51, 1241-52.
- Sheldon, T. (1998), 'Promoting health care quality: what role performance indicators?' *Quality in Health Care*, 7, Supplement, S45-S50.



- Sheldon, T.A. (2000), 'It ain't what you do it's the way that you do it (lecture)', *14th Annual Health Services Research Lecture*, London, LSHTM.
- Sheldon, T.A. (2001), 'It ain't what you do but the way that you do it (editorial)', *Journal of Health Services Research and Policy*, 6, 1, 3-5.
- Shiell, A. (1991), *Economics and Intensive Care: From General Principles to Practical Implications*, York, Centre for Health Economics, University of York.
- Shiell, A. and Griffiths, R. (1991), 'The economics of intensive care', *British Journal of Intensive Care*, 1, 4, 155-60.
- Shortell, S.M., Zimmerman, J.E., Rousseau, D.M., Gillies, R.R., Wagner, D.P., Draper, E.A., Knaus, W.A. and Duffy, J. (1994), 'The performance of intensive care units: does good management make a difference?' *Medical Care*, 32, 5, 508-25.
- Siegel, J.H., Cerra, F.B., Moody, E.A., Shetye, M., Coleman, B., Garr, L., Shubert, M. and Keane, J.S. (1980), 'The effect on survival of critically ill and injured patients of an ICU teaching service organized about a computer-based physiologic CARE system', *Journal of Trauma*, 20, 7, 558-79.
- Silverman, D. (1970), *The Theory of Organisations: A Sociological Framework*, London, Heinemann.
- Silverman, D. (1990[1984]), 'Ceremonial order', in Pugh, D. (ed.), *Organization Theory: Selected Readings* (3rd Edition), London, Penguin Books.
- Silverman, D. (1993), *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction*, London, Sage.
- Silverman, D. (1998), 'The quality of qualitative health research: the open-ended interview and its alternatives', *Social Sciences in Health*, 4, 2, 104-18.
- Singer, D., Carr, P., Mulley, A. and Thibault, G. (1983), 'Rationing intensive care - physician responses to a resource shortage', *The New England Journal of Medicine*, 309, 19, 1155-60.
- Smith, G. and Nielsen, M. (1999), 'ABC of intensive care: Criteria for admission', *British Medical Journal*, 318, 1544-7.
- Smith, L., Orts, C.M., O'Neil, I., Batchelor, A.M., Gascoigne, A.D. and Baudouin, S.V. (1999), 'TISS and mortality after discharge from intensive care', *Intensive Care Medicine*, 25, 10, 1061-5.
- Smith, V. (2001), 'Ethnographies of work and the work of ethnographers', in Atkinson, P., Coffey, A., Delamont, S., Lofland, J. and Lofland, L. (eds.), *Handbook of Ethnography*, London, Sage.
- Snelgrove, S. and Hughes, D. (2000), 'Interprofessional relations between doctors and



- nurses: perspectives from South Wales', *Journal of Advanced Nursing*, 31, 3, 661-7.
- Snider, G.L. (1989), 'Historical perspective on mechanical ventilation: from simple life support system to ethical dilemma', *American Review of Respiratory Diseases*, 140, Supplement, S2-S7.
- Sofer, C. (1973), *Organisations in Theory and Practice*, London, Heinemann.
- Solsona, J.F., Marrugat, J., Masdeu, G., Vazquez, A., Nohales, G. and Balaguer, R. (1993), 'Supply nursing and intensive care unit outcome (research letter)', *The Lancet*, 342, 1240-1.
- Soni, N. and Wyncoll, D. (1999), 'Intensive care medicine comes of age (editorial)', *British Medical Journal*, 319, 271-2.
- Sprung, C.L., Geber, D., Eidelman, L.A., Baras, M., Pizov, R., Nimrod, A., Oppenheim, A., Epstein, L. and Cotev, S. (1999), 'Evaluation of triage decisions for intensive care admission', *Critical Care Medicine*, 27, 6, 1073-1079.
- Steffen, G.E. (1988), 'Quality medical care: a definition', *Journal of the American Medical Association*, 260, 1, 56-61.
- Stein, L.I. (1967), 'The doctor-nurse game', *Archives of General Psychiatry*, 16, 699-703.
- Stein, L.I., Watts, D.T. and Howell, T. (1990), 'Sounding board: the doctor-nurse game revisited', *The New England Journal of Medicine*, 322, 8, 546-549.
- Stelarc (2000), 'Parasite visions: alternate, intimate and involuntary experiences', in Featherstone, M. (ed.), *Body Modification*, London, Sage.
- Stoddart, J.C. (1993), *National ITU Audit*, London, The Royal College of Anaesthetists.
- Strange, F. (1996), 'Handover: an ethnographic study of ritual in nursing practice', *Intensive and Critical Care Nursing*, 12, 106-12.
- Straus, R. (1957), 'The nature and status of medical sociology', *American Sociological Review*, 22, 200-4.
- Straus, R. (1999), 'Medical sociology: a personal fifty year perspective', *Journal of Health and Social Behavior*, 40, 103-10.
- Strauss, A., Schatzman, L., Ehrlich, D., Bucher, R. and Sabshin, M. (1963), 'The hospital and its negotiated order', in Freidson, E. (ed.), *The Hospital in Modern Society*, London, Collier-Macmillan.
- Strauss, A., Schatzman, L., Ehrlich, D., Bucher, R. and Sabshin, M. (1974[1964]), 'The organization of treatment in a psychiatric hospital', in Hasenfeld, Y. and English, R.A. (eds.), *Human Service Organizations: A Book of Readings*, Ann Arbor, The



University of Michigan Press.

- Strauss, A., Fagerhaugh, S., Suczek, B. and Wiener, C. (1997[1985]), *Social Organization of Medical Work* (2nd Edition), London, Transaction publishers.
- Strong, P. (1979a), *The Ceremonial Order of the Clinic: Parents, Doctors and Medical Bureaucracies*, London, Routledge & Kegan Paul.
- Strong, P. (1979b), 'Sociological imperialism and the profession of medicine', *Social Science and Medicine*, 13A, 199-215.
- Svensson, R. (1996), 'The interplay between doctors and nurses - a negotiated order perspective', *Sociology of Health and Illness*, 18, 3, 379-98.
- Tai, D.Y., Goh, S.K., Eng, P.C. and Wang, Y.T. (1998), 'Impact on quality of patient care and procedure use in the medical intensive care unit (MICU) following reorganisation', *Annals of the Academy of Medicine of Singapore*, 27, 3, 309-13.
- Tarnow-Mordi, W., Hau, C., Warden, A. and Shearer, A. (2000), 'Hospital mortality in relation to staff workload: a 4-year study in an adult intensive-care unit', *Lancet*, 356, 185-9.
- Taylor, F.W. (1990[1912]), 'Systematic management', in Pugh, D. (ed.), *Organization Theory: Selected Readings* (3rd Edition), London, Penguin.
- Tenner, P.A., Son, M., Dibrell, H. and Taylor, R.P. (1999), 'Care of critically ill pediatric patients by hospitalists is associated with improved survival (abstract)', *Critical Care Medicine*, 27, 12, suppl., A122.
- Teres, D., Brown, R.B., Lemeshow, S. and Parsells, J.L. (1983), 'A comparison of mortality and charges in two differently staffed intensive care units', *Inquiry*, 20, 282-9.
- The Trust: Intensive Care* (2002), London, Channel Four. (Produced and Directed by Jenny Crowther).
- Thompson, J.D. (1967), *Organizations in Action*, London, McGraw-Hill.
- Tilford, J.M., Simpson, P.M., Green, J.W., Lensing, S. and Fiser, D.H. (2000), 'Volume-outcome relationships in pediatric intensive care units', *Pediatrics*, 106, 2, 289-294.
- Timmermans, S. and Angell, A. (2001), 'Evidence-based medicine, clinical uncertainty, and learning to doctor', *Journal of Health and Social Behavior*, 42, 342-59.
- Timmermans, S. and Berg, M. (1997), 'Standardization in action: achieving local universality through medical protocols', *Social Studies of Science*, 27, 273-305.
- Timmermans, S. and Berg, M. (2003), 'The practice of medical technology', *Sociology of Health and Illness*, 25, Silver Anniversary Issue, 97-114.



- Traynor, M. (1999), *Managerialism and Nursing: Beyond Oppression and Profession*, London, Routledge.
- Turner, B.S. (1995), *Medical Power and Social Knowledge* (2nd Edition), London, Sage.
- Turner, S. (2001), 'Throwing out the tacit rule book: learning and practices', in Schatzki, T.R., Knorr Cetina, K. and von Savigny, E. (eds.), *The Practice Turn in Contemporary Theory*, London, Routledge.
- Van de Ven, A.H. and Delbecq, A.L. (1974), 'A task contingent model of work-unit structure', *Administrative Science Quarterly*, 2, 183-97.
- van Rossum, W. (1998), 'Organization', in Reis Miranda, D., Ryan, D., Schaufeli, W. and Fidler, V. (eds.), *Organisation and Management of Intensive Care: A Prospective Study in 12 European Countries*, Berlin, Springer.
- Vincent, C. and Reason, J. (1999), 'Human factors approaches in medicine', in Rosenthal, M.M., Mulcahy, L. and Lloyd-Bostock, S. (eds.), *Medical Mishaps: Pieces of the Puzzle*, Buckingham, Open University Press.
- Vincent, J.-L. (2000), 'Need for intensivists in intensive-care units', *The Lancet*, 356, 695-6.
- Vincent, J.-L., Suter, P., Bihari, D. and Bruining, H. (1997), 'Organization of intensive care units in Europe: lessons from the EPIC study', *Intensive Care Medicine*, 23, 11, 1181-4.
- Walby, S., Greenwell, J., MacKay, L. and Soothill, K. (1994), *Medicine and Nursing: Professions in a Changing Health Service*, London, Sage.
- Walters, A.J. (1995), 'A Heideggerian hermeneutic study of the practice of critical care nurses', *Journal of Advanced Nursing*, 21, 492-7.
- Watson, W. (1998), 'Psychiatry as craft', *History of Psychiatry*, 9, 355-81.
- Weber, M. (1990[1924]), 'Legitimate authority and bureaucracy', in Pugh, D. (ed.), *Organisation Theory: Selected Readings* (3rd Edition), London, Penguin.
- Weil, M.H., Von Planta, M. and Rackow, E.C. (1989), 'Critical care medicine: introduction and historical perspective', in Shoemaker, W., Ayres, S., Grevnick, A., Holbrook, P. and Thompson, W. (eds.), *Textbook of Critical Care* (2nd Edition), Philadelphia, WB Saunders.
- Wiener, C., Strauss, A., Fagerhaugh, S. and Suczek, B. (1979), 'Trajectories, biographies and the evolving medical technology scene: labor and delivery and the intensive care nursery', *Sociology of Health and Illness*, 1, 3, 261-83.
- Wiklund, P.E. (1969), 'Intensive care units: design, location, staffing ancillary areas,



- equipment', *Anesthesiology*, 31, 2, 122-36.
- Williams, M. (2000a), 'Interpretivism and generalisation', *Sociology*, 34, 2, 209-224.
- Williams, M. (2000b), 'Social research - the emergence of a discipline?' *International Journal of Social Research Methodology*, 3, 2, 157-66.
- Winner, L. (1980), 'Do artifacts have politics?' *Daedalus*, 109, 1, 121-36.
- Wood, M., Ferlie, E. and Fitzgerald, L. (1998), 'Achieving clinical behaviour change: a case of becoming indeterminate', *Social Science and Medicine*, 47, 11, 1729-38.
- Woodrow, P. (1997), 'Nursing perspectives for intensive care', *Intensive and Critical Care Nursing*, 13, 151-5.
- Wright, D., MacKenzie, S.J., Buchan, I., Cairns, C.S. and Price, L.E. (1991), 'Critical incidents in the intensive therapy unit', *The Lancet*, 338, 676-8.
- Young, M.P., Gooder, V.J., Oltermann, M.H., Bohman, C.B., French, T.K. and James, B.C. (1998), 'The impact of a multidisciplinary approach on caring for ventilator-dependent patients', *International Journal for Quality in Health Care*, 10, 1, 15-26.
- Young, M.P., Surgenor, S.D. and Corwin, H.L. (2000), 'ICU organization: does it matter?' in Vincent, J.-L. (ed.), *Yearbook of Intensive and Emergency Medicine*, Berlin, Springer.
- Young, R.K.B., Campbell, D., Reid, J.M. and Telfer, A.B.M. (1974), 'Respiratory intensive care: a 10-year survey', *British Medical Journal*, 1, 307-10.
- Zimmerman, J.E., Shortell, S.M., Rousseau, D.M., Duffy, J., Gillies, R.R., Knaus, W.A., Devers, K., Wagner, D.P. and Draper, E.A. (1993), 'Improving intensive care: observations based on organizational case studies in nine intensive care units: a prospective, multicenter study', *Critical Care Medicine*, 21, 10, 1443-51.
- Zussman, R. (1992), *Intensive Care: Medical Ethics and the Medical Profession*, London, University of Chicago Press.