

INFORMATION USE IN CLINICAL PRACTICE:
A CASE STUDY OF CRITICAL CARE NURSES'
ENTERAL FEEDING DECISIONS

Andrea Marshall RN, BN, MN

A thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

The University of Sydney

2008

ABSTRACT

Although registered nurses have a plethora of information sources available to assist them in making clinical decisions, how this information informs such decisions is not well understood. Through the work undertaken in this thesis a deeper understanding of information use in clinical practice is developed. Information use in clinical uncertainty is explored, specifically in the context of making decisions about enteral feeding practices within the intensive care environment.

Instrumental case studies were used to access the information use processes of registered nurses working in an intensive care unit. Two case sites (a Level III intensive care unit in metropolitan teaching hospital and a Level II intensive care unit in a district hospital) were selected for the purpose of theoretical replication. Data were collected to inform specific issues. Concurrent verbal protocols (think aloud), observation and retrospective probing were used to explore documented clinical decisions and the information used to inform those decisions. Q sorting was used to determine the accessibility and usefulness of information available to participants and focus groups were used to explore senior nurse clinicians' perceptions of the authority of the identified information sources.

A synthesis of findings from the two case sites highlighted three key issues. First, natural testimony (the use of personal communication to obtain information) was privileged over other, more formal sources of information however the veracity of the information obtained through natural testimony was not explicitly assessed. Registered nurses relied on the credibility of the person providing the information, leaving the information itself unchallenged. The clear reliance on information accessed through natural testimony, but the evident lack of critical evaluation of information obtained in this way, indicates a need for the development of strategies for the critical assessment of the accuracy of this clinical information.

Second, the findings highlighted nurses' use of clinical inquiry. Nurses used clinical inquiry to resolve clinical uncertainty as well as for logistic reasons. Participant's use of inquiry was influenced by their approach to work, the impact of both organisational and personal perspectives on the perceived value of their work; and by models of clinical leadership where an investment in relational capital was considered a strategy to positively influence a culture of inquiry. Although organisational documents which are designed to ensure quality and consistency of patient care as required by current clinical governance strategies were considered useful, these documents were not widely used as a primary source of information. The use of organisational documents, as well as the need to practice in concert with such documents, was identified as a factor negatively impacting on the development and support of nurses' use of clinical inquiry.

Third, findings addressed the usefulness of information for clinical decisions and the resolution of clinical uncertainty. The usefulness of information was influenced by its relevance to a clinical question or information deficit, and by the media used to convey the information. In general, print based media was considered more useful than other forms such as electronic documents. While original research was not considered useful, nurses valued research-based practice and responded positively to incorporating research into practice, particularly if research was pre-appraised by colleagues who were able to disseminate research findings to the clinical area and facilitate its use in clinical practice.

This case study indicates that information use is less about individuals and the clinical context in which they are making decisions, and more about the social, cultural and organisational influences that shape decision making, and the information selected to support those decisions. The preference for natural testimony as information in decision making may, on first consideration, be viewed as undesirable in a work context that relies on accurate and consistent documentation. Determining the credibility of the information provider and the accuracy of the information itself is also challenging in an environment where this type of information and the approach to accessing it is selected for its ease of accessibility and the speed at which it can be applied. Yet, the pervasiveness with which nurses rely on others for information suggests verbal testimony is important

in the context of clinical practice and highlights the need to develop a clearer understanding of why nurses privilege this information. Verbal testimony must be considered carefully as a strategy for providing information, particularly research-based information and this study highlights the need to develop strategies that enable those providing information to convey their expertise as a clinician as well as a user and provider of information.

The organisational culture and work structures currently in place in Australia are unlikely to undergo significant change in the coming years, therefore their impact on information use warrants careful consideration. The nursing profession and the higher education sector aim to foster through inquiry, the independent, evidence-based practice of registered nurses. Health care organisations also highly value independent, evidence-based practice but also promote patient safety through use of current clinical governance strategies. While these two goals can be complimentary they also create tension when clinical governance strategies stifle inquiry and independent decision making of registered nurses. Ultimately, the current health care system in Australia and the wider community expect an evidence base for practice together with clinical governance strategies that promote safe practice. Nurses, as part, of this system must be accountable for both in the context of their clinical practice. We therefore need with some urgency to determine how to best balance these complementary and simultaneously competing ideals.

DEDICATION

I dedicate this thesis to my husband, David with whose support I could not have done without. I cannot imagine undertaking a project of this size without you by my side. To Abigail and Hannah who humble me with their knowledge and enthusiasm for learning. To my sister, Alyson, for being there for me and loving all of us. And especially to Mom and Dad, who taught me that you can achieve anything as long as you work hard. I love you all very much.

ACKNOWLEDGEMENTS

This thesis is the product of a terrific partnership. To my supervisors, Associate Professor Sandra West and Professor Leanne Aitken, thank you for joining me on this journey as explored the field of information use and case study methodology. Your friendship has been the most valued outcome of this thesis.

I gratefully acknowledge the staff in each intensive care unit, particularly those nurses who gave their time and shared with me their thoughts about their clinical practice. An important aspect of this study was the ability to collect data as nurses cared for their patients. I thank the patients and their families for their support, interest and encouragement during the data collection process. A special thank to Rosalind Elliott and Marianne O'Reilly for your constant support of my work and of nursing research in general.

To my colleagues at the Faculty of Nursing and Midwifery, The University of Sydney and at the Faculty of Nursing, Midwifery and Health at the University of Technology, Sydney for your sustained interest in my work and for providing valuable advice. Special thanks go to Lesley Muir, Faculty Librarian (retired) at the University of Sydney for wisely introducing me to the work of David Hume. In particular I would like to acknowledge Professor Sharon McKinley who fostered my passion for nursing research and Associate Professor Robyn Gallagher who patiently reminded me of the importance of family and kept me focused on the task at hand.

My ability to complete this thesis has been greatly assisted by two generous scholarships – thank you to the Nurses and Midwives Board for awarding a Category 6 scholarship and to the Royal College of Nursing, Australia for awarding the Myrtle Ivy Quicke Scholarship. The continued support both organisations show for nursing research is to be commended.

DECLARATION

I certify that this thesis has not been previously submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research and work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Andrea Marshall

February 2008

TABLE OF CONTENTS

Abstract	i
Dedication	iv
Acknowledgements	v
Declaration	vi
Table of Contents	vii
List of Figures	xii
List of Tables.....	xiii
Abbreviations	xiv
Glossary	xv
Chapter 1 Introduction	1
1.1 Background	1
1.2 Purpose	4
1.3 Research approach	5
1.4 Relevance	5
1.5 Overview of the thesis.....	6
Chapter 2 Literature review	8
2.1 Introduction	8
2.2 Information and knowledge	9
2.3 Information for clinical practice: what is needed.....	10
2.4 Information use research: methodological issues	12
2.4.1 Study design and data collection methods	13
2.4.2 Clinical context and information use research.....	14
2.5 Information in the context of clinical decision making	17
2.5.1 Preferred sources of information in routine clinical practice.....	18
2.5.2 Information seeking to resolve clinical uncertainty.....	19
2.5.3 Characteristics of preferred sources of information.....	21
2.6 Veracity of information.....	23
2.7 Conclusion	25
Chapter 3 Methodology.....	26

3.1 Introduction	26
3.2 The naturalistic paradigm.....	26
3.3 Case study method	27
3.3.1 Study Issues.....	30
3.3.2 Case sites	31
3.3.3 Ethics.....	31
3.3.4 Data collection	33
3.4 Data collection methods.....	35
3.4.1 Concurrent verbal protocols.....	35
3.4.1.1 Process of data collection for think aloud.....	38
3.4.1.2 Recruitment of participants.....	39
3.4.1.3 Data analysis	40
3.4.2 Q Methodology	40
3.4.2.1 The Q Sample	41
3.4.2.2 The P Sample	42
3.4.2.3 Q sorting and conditions of instruction.....	42
3.4.2.4 Piloting the Q sort process	44
3.4.2.5 Statistical analysis.....	45
3.4.3 Focus groups	48
3.4.3.1 Participants.....	48
3.4.3.2 Setting	49
3.4.3.3 Facilitation	49
3.4.3.4 Group interaction	50
3.4.3.5 Data analysis	51
3.5 Analysis of individual case site data	52
3.6 Cross Case Synthesis	52
3.6.1 Trustworthiness and validity.....	53
3.7 Conclusion	54
Chapter 4 Case site 1	56
4.1 Introduction	56
4.2 Case site 1 description.....	56
4.2.1 The intensive care unit	56
4.2.2 Level of clinical support.....	57
4.2.3 Research and development infrastructure	58

4.2.4 Nursing contribution to research.....	58
4.2.5 Information technology (IT) provision	59
4.2.6 Local university links.....	60
4.2.7 Information sources available to clinical nurses	60
4.3 Study participants.....	61
4.3.1 Stage one – Think aloud participants	61
4.3.2 Stage two – Q sort participants	62
4.3.3 Stage three – Focus group participants	64
4.4 Case site 1 findings	64
4.4.1 Making decisions	64
4.4.2 Information used to support clinical decisions	68
4.4.2.1 Usefulness of information.....	68
4.4.2.2 Accessibility of information.....	73
4.4.2.3 Preferred sources of information.....	80
4.4.2.4 Research as information to inform clinical practice.....	81
4.4.3 Veracity of information.....	83
4.4.3.1 Authority	83
4.4.3.2 Independent Corroboration	89
4.4.3.3 Plausibility	90
4.4.3.4 Presentation.....	92
4.4.4 The nature of inquiry.....	94
4.5 Conclusion	100
Chapter 5 Case site 2.....	102
5.1 Introduction	102
5.2 Case site description.....	102
5.2.1 The intensive care unit	102
5.2.2 Research and development infrastructure	103
5.2.3 Nursing contribution to research.....	104
5.2.4 Information technology provision.....	104
5.2.5 Level of Clinical Support.....	104
5.2.6 Local university links.....	104
5.2.7 Information sources available to clinical nurses	105
5.3 Study participants.....	106
5.3.1 Stage one – Think aloud participants	106

5.3.2 Stage two – Q sort participants	108
5.3.3 Stage three – Focus group participants	109
5.4 Case site 2 findings	109
5.4.1 Making Decisions	110
5.4.2 Information sources used to support clinical decisions.....	114
5.4.2.1 Usefulness of information.....	116
5.4.2.2 Accessibility of information.....	119
5.4.2.3 Research as information to support clinical practice	122
5.4.3 Veracity of information.....	125
5.4.3.1 Authority	125
5.4.3.2 Independent corroboration	127
5.4.3.3 Plausibility	128
5.4.3.4 Presentation.....	129
5.4.4 The nature of inquiry.....	131
5.4.5 Workplace culture and information use	135
5.5 Conclusion	137
Chapter 6 Cross-case synthesis	138
6.1 Introduction	138
6.2 An overview of the cases	139
6.3 Cross-case synthesis.....	140
6.4 Natural testimony	141
6.4.1 Information from others as natural testimony.....	141
6.4.2 The preferential use of verbal testimony.....	145
6.4.3 Evaluating verbal testimony.....	149
6.4.3.1 Source credibility	149
6.4.3.2 Veracity of information obtained through verbal testimony	152
6.5 Inquiry in nursing practice	155
6.5.1 Approach to work.....	155
6.5.2 Inquiry in the workplace	157
6.5.3 Clinical leadership.....	159
6.5.4 Clinical governance.....	161
6.6 The usefulness of information.....	164
6.7 Conclusion	166
Chapter 7 Information use: implications for practice	168

7.1 Introduction	168
7.2 Thesis Summary	168
7.2.1 Methodological issues	170
7.2.1.1 Study design	171
7.2.1.2 Collection of data	172
7.3 Implications for nursing practice	173
7.4 Implications for nursing research	175
7.5 The contribution of this work to the discipline of nursing	176
 Reference list	 181
 Appendices	 196
Appendix 1 Enteral feeding in the critically ill: Are nursing practices contributing to hypocaloric feeding?	197
Appendix 2 Ethics approval	204
Appendix 3 Retrospective probing interview schedule	205
Appendix 4 Case site 1 Q sample	206
Appendix 5 Case site 2 Q sample	207
Appendix 6 Instructions for completing usefulness Q sort	208
Appendix 7 Instructions for completing accessibility Q sort	210
Appendix 8 Merged findings from cross-case synthesis	211

LIST OF FIGURES

Figure 3.1 The case study design	29
Figure 3.2 A conceptual framework for data collection	34
Figure 3.3 The Q sort distribution.....	44
Figure 4.1 Q sort rankings for distinguishing and consensus statements for the usefulness of information at case site 1	71

LIST OF TABLES

Table 3.1 PQMethod data analysis items.....	47
Table 3.2 Suggested questions for analysing group interaction.....	52
Table 4.1 Electronic and print-based sources of information - case site 1	60
Table 4.2 Case site 1: Demographics for thinking aloud participants	62
Table 4.3 Demographics of Q sort participants at Site 1	63
Table 4.4 Usefulness of information sources for case site 1.....	69
Table 4.5 Accessibility of information sources for case site 1	74
Table 4.6 Factor Q-Sort Values and Z score for accessible information sources .	76
Table 5.1 Electronic and print-based sources of information - case site 2	106
Table 5.2 Case site 1: Demographics for thinking aloud participants	107
Table 5.3 Usefulness of information sources for case site 2.....	118
Table 5.4 Accessibility of information sources for case site 2	121

ABBREVIATIONS

APACHE	Acute Physiology and Chronic Health Evaluation
CIAP	Clinical Information Access Project
CINAHL	Cumulative Index of Nursing and Allied Health Literature
DOH	Department of Health
ICCMU	Intensive Care Coordination and Monitoring Unit
ICU	Intensive Care Unit
MIMS	Monthly index of medical specialities
NSW	New South Wales
RMO	Resident medical officer
RN	Registered Nurse

GLOSSARY

Clinical Information Access Project (CIAP) - provides electronic access to clinical information and resources to support evidence-based practice at the point of care. This resource is available to all nurses, midwives, doctors, allied health, community health, ancillary and library staff working in the New South Wales (NSW) public health system.

Clinical Nurse Consultant - The Clinical Nurse Consultant in NSW is a registered nurse appointed as such to a position approved by the Area Health Service, who has at least 5 years full time equivalent post registration experience and in addition who has approved post registration nursing qualifications relevant to the field in which he/she is appointed, or such other qualifications or experience deemed appropriate by the Area Health Service. The Clinical Nurse Consultant:

- provides expert clinical advice to patients, carers and other health care professionals within a defined speciality.
- develops, facilitates implementation and evaluates care management plans for patients with complex health needs.
- provides leadership that facilitates the ongoing development of clinical practice.
- initiates and utilises findings of research in the provision of clinical services.
- contributes to the development and delivery of speciality related education programs.
- participates in formal processes for the strategic and operational planning for the clinical service. The role also involves the organisation and delivery of a specialist consultant service (NSW Department of Health 2005a).

Clinical Nurse Educator - A registered nurse with relevant post-registration certificate qualifications, who is required to implement and evaluate educational

programs at the ward/unit level and is appointed on a personal basis. The Clinical Nurse Educator caters for the delivery of clinical nurse/midwife education at the ward/unit level only (NSW Department of Health 2005a).

Clinical Nurse Specialist - A registered nurse with relevant post-basic qualifications and twelve months experience working in the clinical area of his/her specified post-basic qualification, **or** a minimum of four years post-basic registration experience, including three years experience in the relevant specialist field **and** who satisfies the local criteria (NSW Department of Health 2005a).

Nurse Manager – a registered nurse who co-ordinates and manages a complex function, service or section (including a large and/or complex ward and/or unit or community nursing service), and oversees nursing unit managers within a health facility or hospital (NSW Department of Health 2005a).

Nursing Unit Manager - a registered nurse in charge of a ward or unit or group of wards or units in a public hospital or health service or public health organisation (NSW Department of Health 2005a).

Graduate Certificate – a course of study, usually six months full-time, that assists in broadening of skills already gained in an undergraduate program or developing vocational knowledge and skills in a new professional area.

Graduate Diploma – a course of study, usually 12 months full-time, that assists in broadening of skills already gained in an undergraduate program or developing further specialisation within a systematic and coherent body of knowledge.

Level II Intensive Care Unit – a unit capable of providing a high standard of intensive care, including complex multi-system life support, consistent with the hospital’s delineated responsibilities. The unit should be capable of providing mechanical ventilation, renal replacement therapy, and invasive cardiovascular monitoring for a period of at least several days. All patients admitted to the unit must be referred for management to the attending intensive care specialist

Level III Intensive Care Unit – a tertiary referral unit for intensive care patients capable of providing comprehensive critical care including complex multi-system life support for an indefinite period. Level III units should have a demonstrated commitment to academic education and research. All patients admitted to the unit must be referred for management to the attending intensive care specialist

CHAPTER 1

INTRODUCTION

1.1 Background

Variability in clinical practice, is evident in many areas of health care (Galway et al. 2003) and has been linked to gaps between knowledge and practice (O'Connor et al. 1999) and the failure to consistently recognise the need for information to support the clinical decision making process (Thompson and Dowding 2001). Variability in practice may also result from the use of multiple and diverse sources of information which have been selected to inform the decisions made in a particular clinical context. Nevertheless, there is now an expectation at individual, community, organisational and professional levels of health care that clinical decisions are based on the best available evidence.

Evidence-based approaches to healthcare have rapidly expanded since the early 1990s and contributed to increased pressure for all health care professions to articulate and employ a research base for their practice. The use of research by nurses has been a dominant discourse in the nursing literature for many years and the focus of many studies, commentaries and editorials. Despite attention to this issue, a close connection between research and clinical practice has not been realised (Fink et al. 2005 , MacGuire 2006, Squires et al. 2007, Veeramah 2005). Approaches to understanding research utilisation have progressed from studies concentrating on the nurse as an individual (Barta 1995, Olade 2003, Varcoe and Hilton 1995) to the examination of how organisational structures influence research use (Scott-Findlay and Golden-Biddle 2005, Squires et al. 2007). A systematic approach to understanding research utilisation within nursing and the translation of research use into improved patient outcomes are important goals that rely upon a systematic and theoretically robust approach to work in this area (Cummings et al. 2007, Estabrooks 1999, Estabrooks et al. 2003, Wallin et al. 2006). At present there is a dearth of clear evidence that demonstrates a positive impact by evidence-based decision making on clinically important outcomes for patients. Doran and Sidani (2007) have generated important discussion in this area

by articulating a yet untested framework for improvement in patient outcomes that incorporates the best evidence for practice, patient preference, staff support and measurement of patient outcomes, including real-time feedback about outcomes achievement. While work in this important area of evidence-based practice continues it is the premise of this thesis that the selection of the best available information, preferably research-based information, will have a positive impact on patient care and clinically important outcomes.

Articulating a research base for nursing is challenging because of the profession's relatively underdeveloped research base. Further, a uniformly research-based approach to practice is not necessarily desirable and research should be used in conjunction with other important sources of information that are also valuable when making complex clinical decisions (Holmes et al. 2006). The use of research alongside other, less formal sources of information is incorporated into what Cullum (1998) describes as an evidence-based clinical decision where the complementary (and occasionally competing) influences of clinical experience, patient preference, available resources and research evidence are successfully combined, thus recognising the value of various sources of information used to inform clinical decisions. Although this approach to evidence-based practice does broaden the scope to include the many and varied sources of practice information it does not necessarily eliminate variability in clinical practice.

Variability in clinical practice can be viewed as having negative connotations or as an example of a failure to base practice upon evidence but this is not necessarily so. Variability in clinical practice can also result from full consideration of the influences described by Cullum et al. (1998) and may in fact exemplify the successful combining of research with the patient's preference and available resources. Where variability in clinical practice becomes concerning is when it occurs as a consequence of less than full consideration of the combination of clinical experience, patient preference, available resources and research evidence – a situation which also frequently inhibits practice improvement.

Evidence-based practice is associated with optimal patient care and organisational efforts such as clinical practice guidelines and evidence-based practice have been implemented to promote consistency in clinical decision making (Carnett 2002). While such efforts organisational efforts to ensure consistency in clinical decision making and the patient care contingent upon such decisions are valued, the likelihood of successfully achieving a consistent and sustained change to practice based on such strategies remains uncertain (Hesdorffer et al. 2002, Young et al. 2004). The excessive promotion of consistency in practice asserts an underlying, but possibly not fully realised, assumption that variability in practice is directly linked to poorer patient outcomes. Whereas such variability in practice may well be the result of appropriate consideration and application of (other – possibly non-evidence based) information to individual clinical presentations.

Amidst the support for evidence-based practice is also a growing level of discontent from critics who claim that favouring research ignores other, equally important, sources of information (Holmes et al. 2006, Fulbrook 2003). The work of Carper (1978) acknowledges the importance of research as a way of knowing in nursing but also places equal importance on other ways of knowing such as aesthetics, personal knowledge and ethics. Liaschenko and Fisher's work, while acknowledging the importance of research in nursing practice, also highlight the value of knowledge not based on research and stresses that patient knowledge, which can only be partly supported by research, is the 'largest and most complex domain and also absolutely critical to the work of nursing' (Liaschenko and Fisher 1999, p. 35). In the context of education practice, Kennedy (1983) examined how evidence is incorporated into working knowledge, that is the organised body of knowledge used routinely in work. In addition to various forms of evidence, experiences, beliefs, and interests were acknowledged as central to the development of working knowledge. Importantly, Kennedy recognised the changing nature and the unique way in which individuals acquire and use working knowledge and described working knowledge as,

...continually accumulating and evolving: it consists not only of evidence but of experiences, interests and beliefs as well; it is organised; and its contents and organization differ from one individual to another' (p. 200)

Clearly different ways of knowing are necessary for nursing practice. The discipline's emphasis over recent decades on the use of research in practice has seen a plethora of scholarly work examining research use in clinical practice (Booth 2005, Bradley et al. 2004, Estabrooks et al. 2004, French 2005, Glacken and Chaney 2004, Olade 2003, Veeramah 2005) and this work continues (Boström et al. 2007, Squires et al. 2007) despite evidence that nurses infrequently use research to support clinical decisions (Estabrooks et al. 2005a, McCaughan et al. 2005, Thompson et al. 2001c). It appears that nurses, and other health care professionals, favour information sources that are easily accessible, informal, interactive and able to be applied clinically with minimal difficulty.

1.2 Purpose

The purpose of this thesis was to examine critical care nurses' use of the information available to inform clinical decisions made under situations of uncertainty. Uncertainty in clinical practice is associated with many aspects of patient care and can arise for a variety of reasons in critical care environments. The nursing management critically ill patients receiving enteral feeding was selected as the clinical focus in order to provide a framework within which the information used by critical care nurses who were making clinical decision could be examined.

The nursing management of enteral feeding was selected as it is area of clinical practice that is heavily influenced by nurse decision making (Marshall 2004, Persenious et al. 2006) but also one associated with a high degree of variability in practice. The somewhat surprising degree of variability in enteral feeding practice at a local level was highlighted during previous work (Marshall 2001) conducted in one location. This prompted a closer examination of the enteral feeding practice of registered nurses working in critical care, general wards and aged care areas. An Australian-wide survey of enteral feeding practice

was conducted in 2003. Six-hundred and ten fully completed surveys were received and of these 367 registered nurses indicated that their primary area of clinical practice was critical care. The results of the survey responses of these 376 critical care nurses suggested variability in enteral feeding practice extended beyond a local level and demonstrated greater variability than what had been recognised previously (Marshall and West 2006). The published results of this survey are provided for reference in Appendix 1.

1.3 Research approach

The literature suggests that information use in clinical decision making relies heavily on social interactions (Estabrooks et al. 2005b, Profetto-McGrath et al. 2007, Sharit et al. 2006). Much of this work is the result of self-report studies that are unable by their very design to explore or eliminate any bias introduced as a result of social conformity. Participants in self-report studies may also be providing responses based on what it is believed the researcher wants to know, rather than data reflecting the true state of practice. For this reason, case study method was selected as a suitable approach to address information use in decision making because it allowed the case to be constructed out of naturally occurring social situations, that is, how critical care nurses sought information when situations of uncertainty presented in clinical practice (Hammersley 2000). The multiple methods of data collection that underpin case study method were then selected to promote a full understanding of the case thus allowing for the complexities to be highlighted but also considered within the context of clinical practice (Stake 1995, Yin 2003).

1.4 Relevance

Critical care nurses provide care for patients with complex clinical presentations that may require a variety of management approaches. The rapidly changing clinical context means that clinical decisions often need to be made rapidly and with particular reference to individual patient situations. There is a growing expectation, on the part of clinicians and the wider community, that such clinical decisions are based on the best available evidence. Consequently, there

has been increased pressure within the health care environment to implement evidence-based practice. For the most part evidence relates to the use of research in practice although consensus on what constitutes 'evidence' remains elusive. Significant effort directed toward an increase in research utilisation has not led to the anticipated increase in research use by clinical nurses. Current strategies of increasing information literacy and critical appraisal skills appear to fall short. It is therefore timely to more closely consider what information nurses require to inform the clinical decisions they are required to make and how they access this information within the clinical environment. A clearer understanding of information use in clinical decision making will assist in developing more effective strategies to promote evidence-based practice and ultimately improve patient outcomes.

1.5 Overview of the thesis

This thesis is organised in seven chapters and is supported by a glossary and list of abbreviations. The list of abbreviations is specifically designed to support abbreviations used within the tables and figures which present data from case sites 1 and 2. This first chapter has provided the background to the study, its purpose, the research approach used and the relevance of this study to nursing practice.

Chapter 2 reviews the relevant literature on information seeking and information use by health care professionals. Some of the literature uses the terms information and knowledge interchangeably so clear descriptions of these terms have been included. This chapter also focuses on methodological issues relevant to the information use and information seeking literature. In particular study design, data collection methods and the context of studies have been discussed as they relate to particular studies. Section 2.5 specifically addresses the information use by nurses in support of clinical decisions and the final section of this chapter explores issues associated with the establishment of the veracity of information sources used by nurses in clinical decision making.

Chapter 3 describes the methodology for study and discusses the advantages of naturalistic inquiry and case study as a design framework. This study used

multiple methods of data collection (concurrent verbal protocols with retrospective probing; Q sorting; and focus group interviews), each of which is described in detail in section 3.4. The proposed analyses of data from individual cases and cross case analysis are then described.

Chapter 4 and 5 include a comprehensive description of each case site and study participants and provide an initial representation of the findings from case site 1 and 2 respectively. Findings common to both case sites are presented in their respective chapters and include making decisions, information used to support clinical decisions, the veracity of information and the nature of inquiry. Case site 2 (discussed in Chapter 5) contributed an additional finding specific to this case site which identified organisational culture as impacting on information use by nurses.

The synthesis of findings from both case sites is presented in Chapter 6. In this chapter information gained from others is discussed as natural testimony. The preferential use of natural testimony as a source of information is examined alongside the challenges establishing the veracity of such information. Chapter 6 also discusses inquiry in nursing practice. Inquiry in practice was influenced by nurses' approach to work, inquiry in the workplace, clinical leadership and clinical governance, each of which is discussed in detail. Chapter 6 concludes with a discussion of how usefulness (or the perception thereof) is critical to the selection of information required for clinical practice and the resolution of clinical uncertainty. Two key factors impacting on the perceived usefulness of information include the clinical context in which it is required and the media through which the information is presented.

The thesis concludes by providing an overview of the thesis and highlights key findings. Methodological issues specifically related to study design and data collection are identified and their impact discussed. Chapter 7 highlights the implications the findings of this thesis have on both nursing practice and future nursing research. The thesis concludes by emphasising the contribution this work has for nursing practice.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Information use by health professionals is a multidisciplinary research field. For more than two decades researchers in the health professions, together with those in library and information science have attempted to articulate the information-seeking behaviours and information use of health care professionals who have direct responsibility for patient care. Much of the focus has been on information-seeking within the limited context of available published information, although more recently an increasing awareness of the vast array of information sources now available to health care professionals has resulted in attempts to determine the preferred for use in clinical decision making.

This chapter introduces important concepts relating to the use of information to make clinical decisions. First, a distinction is made between information and the knowledge used to inform clinical decisions. This is followed by a discussion of what information is needed in clinical practice. Methodological issues associated with studies of information use and information seeking are then discussed because issues such as study design, data collection procedures and context, influence the ability of individuals to use the results of these studies in the context of clinical decision making in nursing. An important focus of this chapter is the work specifically addressing the information used by nurses to inform their clinical decisions, their preferred sources of information and the characteristics associated with these information sources. The determination of the accuracy of information is also an important aspect of information use and as such the remainder of the chapter is dedicated to concepts surrounding the veracity of information.

2.2 Information and knowledge

Information use is a broad area which is also influenced by many disciplines resulting in the independent determination of terminology by various groups and generation of a variety of terms to express similar concepts. Research based information, for example, is one form of information available to inform clinical practice yet there are many terms used to describe the use of research based information including terms such as research utilisation, evidence-based practice and knowledge utilisation (Estabrooks et al. 2004).

Within the context of information use the terms knowledge and information are also used interchangeably. It is important that a clear distinction between these two terms is made because while they are used synonymously they each have specific meaning. Stenmark (2002), from a knowledge management perspective, examined the philosophical distinctions between information and knowledge suggests that information is factual, explicit and able to be processed. Knowledge, on the other hand, is socially constructed and encompasses beliefs and commitments and implies the application of subjective meaning when information is used. The subjective nature of knowledge is supported by Kennedy (1983) who, in an educational context, described working knowledge as being individually constructed, encompassing individual experiences and beliefs. In the context of nursing knowledge subjectivity is also acknowledged by the inclusion of aesthetic ways of knowing (Carper 1978) and what Liaschenko refers to as person knowledge (Liaschenko and Fisher 1999).

However, clearly distinguishing information and knowledge is challenging, because the two concepts are intricately related. Alavi and Leidner describe this relationship when writing about knowledge management and knowledge management systems and suggest that ‘information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated’ (Alavi and Leidner 2001, p. 109). In the context of clinical decision making, information available for clinical practice is of no use if the clinician does not have the requisite knowledge to allow information to be understood. The articulation of knowledge is also required for

information to be shared. Clearly both information, and the knowledge necessary to interpret and apply the information, is required for clinical decision making.

While distinctions between knowledge and information can be made it should also be acknowledged that the lack of consistent terminology in the literature does not detract from work in this area. For the purpose of this thesis, however, clear distinctions between information and knowledge are required. For this reason the definitions proposed by Stenmark will be used to typify information and knowledge, where information refers to what is 'tangible and represented as objects outside the human mind' (Stenmark 2002, p.2) and knowledge referring to what is based on 'personal experiences and cultural inheritance and fundamentally tacit' (p. 9). Both information and knowledge are critical to an informed clinical decision. For simplicity, hereafter the term information should be considered to encompass explicit and tangible sources of information as well as knowledge, such as personal experience, which is fundamentally tacit.

2.3 Information for clinical practice: what is needed

The context in which information is sought influences the type of information required. Despite the abundance of research addressing either information use or clinician decision making there is relatively little known about decision making in the context of the clinical uncertainties faced by health care professionals and nurses in particular, or what type of information they might seek to resolve such clinical uncertainty. The information-seeking literature suggests questions about patient care are the primary reason for information seeking by nurses (Blythe and Royle 1993, Corcoran-Perry and Graves 1990, McCaughan et al. 2005) and doctors (Bryant 2000, Casebeer et al. 2002). Corcoran-Perry and Graves (1990) in a study of cardiovascular nurses information seeking observed that the vast majority of information was patient-specific, such as history and physical assessment data and medication information. Similarly, McKnight (2006) found that critical care nurses information seeking was less about an articulated query and more akin to environmental scanning and acquiring patient specific information. Similar results are observed in the information seeking of physicians although specifics about the type of patient information sought was unclear, it was indicated that information was sought for the purpose of patient care (Blythe and

Royle 1993, Bryant 2000, Thompson 1997). For example, in a study of nurse practitioners and practice nurses' use of research information for decision making McCaughan et al. (2005) identified the majority of decisions, and therefore information seeking, as being related to patient management. Logistic (such as operational issues) and social (such as physician preferences) reasons were also cited as reasons for information seeking while knowledge-based information was less frequently sought (McKnight 2001, Urquhart and Davies 1997).

While information pertaining to patient care is often sought by clinicians, the nature of practice for some nurses also requires that they seek information outside of the context of direct patient care. For example, Lathey and Hodge studied the information seeking behaviour of occupational health nurses and found that the majority of the time information was sought regarding government regulations pertaining to health care (Lathey and Hodge 2001). This is not a surprising finding, given the context and focus of work for occupational health nurses.

Clinical Nurse Specialists' use of information also related directly to the work they were required to undertake. Profetto-McGrath et al. (2007) described information seeking practice of Clinical Nurse Specialists. The role of the Clinical Nurse Specialist in this study was not clearly described but others (Armstrong 1999) have identified these positions as a resource for practicing nurses dealing with complex clinical questions and may include administrative, educational or research responsibilities. In the context of this study, information seeking was part of the administrative duties held by these nurses and was often conducted to address queries arising from formal research projects. Information seeking was also in response to queries posed by clinicians who may be faced with complex clinical issues. Thus information seeking in this study of Clinical Nurse Specialists is congruent with the advanced practice role and highlights the clear link between work required by the nurse and the information they require.

The level of inquiry described in some studies of information use is relatively superficial and limited by study design. Few studies explored the need for and use of information within the real-world context of clinical practice (Blythe and Royle 1993, Corcoran-Perry and Graves 1990, McCaughan et al. 2005, McKnight 2006, McKnight 2001), but none were framed within the specific context of seeking

information to resolve clinical uncertainty. For most of these studies the need for information related to a requirement to undertake specific practice-related work and was not associated with complex clinical decision making or developing a more extensive clinical knowledge base.

2.4 Information use research: methodological issues

What information health care professionals use to inform clinical decisions has the potential to impact on the provision of evidence-based health care. Important issues include both how information is accessed and what information is considered to be of use in clinical decision making. Many of the early studies addressing information use by health care professionals concentrated on the use of specific, and often singular, information sources including the internet (Westberg and Miller 1999), library services (Bowden et al. 1994), indexes and databases (Curtis et al. 1997, Griffiths and Riddington 2001,) and continuing medical education (Gruppen 1990). A particularly strong focus has been the use of research to inform clinical practice and this is closely linked to the evidence-based practice movement. However, research utilisation studies also has a singular focus on research as a source of information, likely because the use of research to support clinical decisions is valued but infrequently employed (Estabrooks et al. 2004, Squires et al. 2007). Examining the use of specific information sources may be helpful in evaluating service provision and the overall use of such resources. The availability of information sources such as those described above is one step in understanding the use of this information for clinical decision making. It is also important to consider how and why nurses might use these sources in conjunction with or in preference to all of the information sources available in the clinical setting.

Most of the studies examining singular information sources stem from the field of library science. Studies by health professionals and those working in information science have looked more broadly at the information sources used in clinical practice. While many of these studies do add to our understanding of information use by health care professionals, methodological issues such as the use of post hoc data collection do not allow for a complete understanding of how information is used to support clinical decisions. Additionally, the context in

which information is required may influence information seeking highlighting the importance of investigating information use by nurses within the context of their clinical practice.

2.4.1 Study design and data collection methods

Major methodological issues impacting on many studies addressing information use include the extensive use of self-report in data collection and the persistent use of post hoc data collection. A large number of the available studies on information use have relied on survey data from select populations, often with small sample sizes. Two systematic reviews of information use, one including studies of physicians' preference for information sources published between 1978 and 1992 (Haug 1997) and a more broad review of publications (1990-1999) related to health care providers' information seeking (McKnight and Peet 2000) show a marked preference for the use of survey. Surveys result in primarily descriptive information and it is often difficult to use this data to develop a deeper understanding of the issues. Conducting interviews either as a primary method of data collection or as an adjunct to survey data may yield additional data useful to developing a clearer understanding of information used in clinical decision making but may also be influenced by participant's reflection of their use of information in clinical decision making.

The use of self-report data can also be problematic. In a study of 47 Internists conducted by Covell et al. (1985) discrepancies between data obtained through two types of self-report data - survey and that obtained during interview. The self-report information obtained through survey suggested that information in the form of texts were more frequently sought while interview data suggested that participants would more often consult another person for information. This study has been used widely to warn against discrepancies between what participants say and what they actually do. This assertion is problematic, however, as neither methods of data collection (survey and interview) result in data that is reflective of actual practice, but rather both are suggestive of the participant's perception of their information seeking behaviour. In contrast, the work of Corcoran-Perry and Graves (1990) showed that self-report data obtained through survey and a combination of observation/interview were similar in the amounts of data

obtained. However, it is not clear how equivalence between these data collection methods was established. Corcoran-Perry and Graves (1990) allowed the participants in their study to choose whether data was collected using a self-report survey or through an episode of observation. Overwhelmingly participants (80%) chose to complete the self-report survey. However the possibility remains that the quality and accuracy of data obtained post hoc through self-report survey may differ from that collected naturalistically in real-time (Forsythe 1998).

More recent studies have attempted to overcome the bias associated with self-report and the collection of post hoc data and have included observation as an aspect of data collection (Estabrooks et al. 2005a, McCaughan et al. 2005, Thompson et al. 2001b). The context in which this observation occurs may strongly influence the types of information being identified as used by nurses. For example, both the work of Corcoran-Perry and Graves (1990) and McKnight (2006, 2001) observed the normal work practice of nurses in critical care areas. This observation of routine practice showed an overwhelming reliance on information in the form of patient data, such as that obtained through clinical assessment and patient documents; information which McKnight described as patient specific, logistic and social in nature and equated with that obtained through environmental scanning (McKnight 2006). Clearly this type of information is important as the focus of clinical nursing work is patient care but does little to further develop our understanding of information required to resolve episodes of clinical uncertainty. Both Thompson et al. (2001c) and McCaughan et al. (2005) have argued the importance of conducting studies within the naturalistic setting to more fully understand information use in clinical decision making.

2.4.2 Clinical context and information use research

Contextual issues can impact on the data obtained in studies of information use in clinical practice. There is a plethora of studies on information use in medicine many of which are summarised in the works of Ellayan (1988), Blythe (1992), Verhoeven (1995), Haug (1997), Bryant (2000) and Casebeer (2002). Studies conducted in the context of medicine and information use by physicians predominantly feature self-report data and consequently suffer the same methodological challenges as those described above. Many of these studies have

also been conducted in isolation and the lack of systematic programs of research in the area and the absence of a sound theoretical base for these studies further limits the contribution made to this area. While the findings of these studies can be used to further develop the understanding of information use by nurses, the transferability of findings may be problematic because of the contextual differences in practice between physicians and nurses. For example, although both part of the health care team, physicians may be more likely than nurses to make decisions independently and the decisions they make may require different sources of information.

Information use has also been examined in the context of other health professions such as physiotherapy (Bohannon 1990, Hall 1995), dental services (Gravois et al. 1995), research (Korjonen-Close 2005) and veterinary science (Pelzer and Leysen 1991). As with medicine, information use studies in these areas may provide insight into information use by nurses but readers should be mindful of contextual factors influencing information use, such as the degree of independent and autonomous decision making, access to information sources and the nature of the work environment which may influence the transferability of findings.

The context of nursing practice is important as is the specific context in which individual nurses work. Although some nurses work in isolation, most are employed within a hospital setting and consequently do not work alone. This potentially impacts the information sources available and thus what might be a preferred source of information. In a study of veterinarians, Pelzer and Leysen (1991) reported that print-based information sources, such as textbooks and journals were preferred over information obtained from another person. The results of these findings are not consistent with other studies in the context of nursing practice which report a preference for information gained through social interaction (Estabrooks et al. 2005a, Estabrooks et al. 2005b, Lathey and Hodge 2001, McCaughan et al. 2005) and may be explained by the fact that almost 50% of participants in Pelzer and Leysen's (1991) study were working as sole practitioners. It may well be that where clinicians are working alone, accessibility

to print-based materials increases and thus influences the choice of information accessed.

Context can also significantly influence the sources of information selected to inform practice. Barta's (1995) study of 213 paediatric nurse educators had participants self-report information seeking behaviour in relation to four categories of information: print media (10 sources); non-print media (9 sources); interpersonal communication (8 sources); and formal education activities (12 sources). Participants were asked to consider information sources in the context of updating instruction for baccalaureate degree students. The results indicated that journals were the preferred amongst print-based information sources (n= 208; 98%) and were the first choice overall (n=88; 42%). Informal conversations in the clinical setting also were highly regarded as being useful when compared to other interpersonal communication in the clinical setting (n=195; 92%) but did not rate overall as a useful source of information. When participants selected their first choice for useful information sources from all categories nursing journals predominated (n= 88; 42%), followed by texts (n=32; 15%) and education by specialty groups (n=27; 13%) (Barta 1995). These results are not surprising given the research questions under investigation were clearly focused on the use of information to update instruction for baccalaureate degree students.

Within the context of aged-care a multidisciplinary study Bird and Heekin (1994) sought to explore the use of electronic information sources although reasons for information seeking were not made clear. While data were obtained from many disciplines, nurses were the second largest group represented (18%). When regrouping the disciplines into broad categories the social science discipline predominated (53%) and health sciences constituted 47% of the sample. What is perhaps unique to this sample is the high percentage of participants who held postgraduate qualifications. Forty-five percent of the participants held a PhD, 33% held a Master's Degree and 13% held a medical degree. In this study there was a preference towards the use of journals over professional meetings and discussions with colleagues as the information sources used to keep up-to-date. The context of this study is clearly different from that of clinical nurses in that the level of educational preparation is not consistent with most nurses working in clinical

practice. Also, reasons for seeking information were related to keeping up-to-date and not in the context of addressing issues of immediate clinical uncertainty.

2.5 Information in the context of clinical decision making

Within the context of patient care nurses are frequently required to make many different types of clinical decisions where the nurse must choose from a range of options, including the possibility of doing nothing at all. While the type and frequency of clinical decisions varies, decisions are each influenced by the nurse's 'work environment, perceptions of their clinical role, operational autonomy, and the degree to which they see themselves as active and influential decision-makers' (Thompson et al. 2008, p. 261).

The emphasis on evidence-based decision making suggests a corresponding reduction in the variability of decisions that are made by nurses should be observed (Bucknall 2003). However, decision making in the clinical setting is complicated by the need to integrate complex information from a variety of different sources, use imperfect or incomplete information, accommodate uncertainty about the decision, consider patient preferences, and take into consideration the costs and effectiveness of various strategies (Tavakoli et al. 2000). The complexity of clinical decisions also increases when there are time pressures on decision making, when decisions need to be made in the context of rapidly changing clinical conditions, and where there may be disagreement amongst health care professionals (Thompson et al. 2008). Such complexity creates a challenge for nurses working within a healthcare system that expects rational, consistent and accurate clinical decisions that may lead to improvements in patient outcome (Bucknall 2007).

It is argued that an evidence-based approach to decision making should reduce variability in clinical practice and result in improvements in the quality of patient care (Cullum et al. 2008). However, decision outcomes can be considerably influenced by the information used to support clinical decisions. Many of the studies on the use of information to support clinical decisions highlight a preference for social interactions as a method of seeking information; however the studies are largely descriptive in nature and have not allowed for a

comprehensive description of preferred knowledge sources. Estabrooks et al. (2005b) report the findings of two large ethnographic case studies which informed the development of a taxonomy of knowledge sources. Four broad groupings of sources of practice knowledge were identified: social interactions, experiential knowledge, documentary sources, and a priori knowledge. Not surprisingly, social interactions, both formal and informal, dominated the findings. Informal interactions were described as those between nurses themselves, between nurses and other professionals and between nurses and patients and appeared to be triggered by episodes of clinical uncertainty. There was far less reliance on formal knowledge sources, such as research reports, which may reflect known barriers to research utilisation (Veeramah 2005). However, Estabrooks et al. (2005b) argue that the nature of nurses' work may contribute significantly to the use of information sources that are, as Carper (1978) describes, of a more aesthetic nature and may in part explain the poor uptake of research as information to support clinical decisions.

Obtaining information from a colleague may be preferred as a source of information (Estabrooks et al. 2005b, Thompson et al. 2001a, Thompson et al. 2001c) because they may be viewed as being highly accessible (Thompson et al. 2001a) and providers of reliable and accurate information (Casebeer et al. 2002, Dee 1993). Close proximity does not, however, adequately explain the privileging of colleagues over other sources of information. In many clinical areas print-based and/or electronic information sources are also readily available. Furthermore, Dee's (1993) study of information seeking by rural physicians suggests that physical distance is a barrier that can be easily overcome if information is sought from a trusted colleague. The reasons why nurses prefer information from colleagues is not yet clear and highlights an area for further research.

2.5.1 Preferred sources of information in routine clinical practice

Information gained through social interaction is clearly the preferred source of information for nurses (Estabrooks et al. 2005b, Profetto-McGrath et al. 2007, Thompson et al. 2001b), doctors (Bryant 2000, Covell et al. 1985, Thompson 1997) and other health care professionals (Gravois et al. 1995, Hall 1995).

However, preferred information sources appear to be influenced by contextual factors and the nature of nurses' work. Research that addresses information seeking in the context of routine practice suggests that information is most often obtained from the patient and clinical monitoring equipment (McKnight 2001). Similarly, Corcoran-Perry and Graves (1990) also found a preference toward patient specific information, although noted that information was equally obtained from both verbal and written sources of information, particularly patient notes. The preference towards patient-specific information is to be expected because direct patient care was the stimulus for most (76%) of the information sought.

The work by McKnight (2001) and that of Corcoran-Perry and Graves (1990) provides a snapshot of information use within the clinical setting. In an attempt to provide a more comprehensive picture of information use, Estabrooks et al. (2005a) conducted a longitudinal cross-study comparison of preferred knowledge sources for routine clinical practice using data from three studies conducted over a six-year period (Baessler et al. 1994, Estabrooks 1998, Estabrooks et al. 2005a). The comparison of findings from these three studies showed that the patient and personal experience consistently ranked as the two most frequent sources of knowledge (Estabrooks et al. 2005a). Unlike previous work, these studies included personal experience as a source of practice knowledge; an important consideration given personal experience has been widely recognised as essential for nursing practice (Baumann and Bourbonnais 1982, Kennedy 1998, Luker and Kenrick 1992). The information required to provide routine patient care logically focuses on acquiring patient-specific data which is then used to inform patient care. Additionally, logistic and social information will also be required, although likely to a lesser extent.

2.5.2 Information seeking to resolve clinical uncertainty

Uncertainty as a feature of clinical practice is well recognised nevertheless both providers and consumers of health care continue to strive for certainty in this area (Mullavey-O'Byrne and West 2001). Uncertainty in clinical practice can arise because of the breadth of knowledge relevant to health care, the lack of available knowledge or information required to develop a full understanding, and differentiating between deficits in personal knowledge as opposed to gaps in the

available knowledge itself (Fox 2000). In the health care context attempts are made to minimise uncertainty by conducting research that contributes to knowledge generation (Adamson 1997) which may help resolve clinical uncertainty potentially may also uncover previously unrecognised areas of clinical uncertainty.

The emphasis on research-based information and continued push for an evidence-base for practice can be seen as a strategy that attempts to provide certainty in clinical decision making as it is premised by the identification of the best possible evidence or information on which to base patient care (Hester-Moore 2005). However, clinicians are required to make decisions regarding information veracity and the appropriateness of its application to particular clinical situations rendering uncertainty ‘an unavoidable characteristic of clinical decision making’ (Baumann 1991, p. 173).

The nature of nursing work is also an important contributor to uncertainty in the clinical setting. Inconsistencies in nursing and medical management, the inherent unpredictability of nurses’ work and the complexity of working with other disciplines are all contributing factors (Scott et al. 2008). In the context of critical care nursing practice the rapidly changing clinical conditions of patients further contribute to the clinical uncertainty experienced by clinical nurses. The decisions made in clinical practice are also dependent on the information accessed to guide clinical decision making thus the information itself may lead to practice variability. The uncertainty that features so strongly in clinical practice influences clinical decision making and is, in part, responsible for the wide variations observed in clinical practice (Eddy 1994).

Seeking information to assist with resolution of clinical uncertainty should be substantially different to seeking information that is required for routine patient care. Blythe and Royle’s (1993) qualitative study conducted in the work environment assessed the information needs of 32 medical oncology/haematology nurses. The primary focus for information seeking was again issues to do with patient care but this study also highlighted the need for multiple sources of information when complex clinical questions were presented. In this study the

participants were directly involved in providing patient care and would seek more than one source of information to assist in resolution of the uncertainty.

In contrast, Profetto-McGrath et al.'s (2007) study of Clinical Nurse Specialists, highlights the use of Clinical Nurse Specialists as providers rather than recipients of information when situations of clinical uncertainty were presented. Because this group of nurses were considered an important source of information by nurses providing direct clinical care they used multiple sources of information in order to develop a deep understanding of the issue and thus enable them fulfil their role as a credible source of information for clinical practice. Although there is relatively little work on information use in the specific context of clinical uncertainty it appears from these two studies that how and why nurses access information when non-routine and complex clinical questions arise may be different than that required for routine and anticipated patient care.

2.5.3 Characteristics of preferred sources of information

Clinicians appear to value information that is considered useful, accessible, accurate and of high quality. Thompson et al. (2001b), using case study method, investigated information use in decision making by nurses in three large acute care hospitals in the United Kingdom. Using multiple methods of data collection they interviewed 108 nurses, observed 61 nurses for a total of 180 hours and involved 122 nurses in a Q modelling exercise. This research strategy contributed to a deep understanding of the usefulness and accessibility of information in the context of clinical decision making.

Usefulness of information was an important characteristic explored by Thompson et al. (2001c). Data revealed four perspectives on the usefulness of information: direction, guidance or prescription; usefulness as experiential knowledge; centrally supported experience-based messages for practice; and blending research, technology and experience for usefulness. Although four clear perspectives were identified, in each of these perspectives there was an overwhelming view that people were the most useful as a source of information for the resolution of clinical uncertainty. This view of usefulness is likely to influence the chosen approach to accessing sources of information and thus

increasing the use of predominantly human sources, as opposed to print or electronic based mediums. Thompson et al (2001a) suggested that it was not the research knowledge itself that was not valued but rather the way in which the information was conveyed. In the context of clinical practice these nurses viewed trusted and clinically credible human sources of information as being more useful than print and electronic medium. However, concern was expressed that reliance on another, more experienced nurse may reflect avoidance in decision making and consequently result in a degree of de-skilling.

Within the scope of this study, the concept of accessibility of information, in terms of physical and intellectual accessibility, was also explored and revealed three perspectives: the humanist; local information for local needs; and moving towards technology. In this study the main cross-factor was the accessibility of human sources, specifically those who combined a research utilisation remit with clinical work however it was also noted that 'powerful individuals often carried extra weight in decision processes because of the supporters' clinical (rather than research) credibility (Thompson et al. 2001a, p. 20).

The reliance on others as a source of information may be convenient and useful but is more difficult to evaluate in terms of its accuracy. The increased demand for accountability and transparency in clinical practice becomes difficult when information embedded in practice and clinical experience is used because they exist 'in the personal, not public domain and as such are protected from debate and scrutiny' (Estabrooks et al. 2005b, p. 473). The level of trust attributed to information obtained from others can be concerning. As Thompson (2001a) described, an assumption that more experienced nurses worked according to established protocols could not be affirmed because documents were infrequently consulted. Concerns about the variability of clinicians practice, and therefore information, have also been raised (Thompson et al. 2001c). Clearly, obtaining information through informal strategies is appropriate and reasonable for clinical practice but must not be indiscriminately trusted. This is not to say that information obtained from others is invalid or inaccurate but rather that its veracity is more difficult to assess. Strategies for determining the veracity of

formal and informal sources of information used in clinical practice are clearly warranted.

2.6 Veracity of information

At the crux of information seeking is a general premise that it is pointless to obtain information unless it is accurate, truthful and precise; characteristics which underscore the veracity of information. In the context of clinical practice the veracity of information used to guide clinical decisions is important because of the potential impact the use of such information may have on clinically important patient outcomes. While issues of information veracity are critical to consider before information is used to inform clinical decisions (Hernon 1995) it is often challenging for clinicians to determine the accuracy of information (Fallis 2004). Strategies for evaluating research quality are abundant but there is little available to guide nurses and others in assessing the accuracy of informal information sources. The veracity of information is particularly difficult when verbal testimony, or information from others, is the source of information used in clinical decision making.

The work of David Hume (1748/2004) on the epistemology of testimony has the potential to serve as a framework for assessing veracity of informal sources of information. Hume, writing in *An Enquiry Concerning Human Understanding* stated -

'we should entertain suspicion concerning any matter of fact, when the witnesses contradict each other; when they are but few, or of a doubtful character; when they have an interest in what they affirm; when they deliver their testimony with hesitation, or on the contrary, with too violent asseverations' (Hume 2004 (originally published 1742)) p. 61

Hume's statement suggests that there are strategies that can be applied to evaluating information sources, particularly those obtained through the testimony of others. Fallis (2004), writing in the context of web-based information, refers to Hume's *Epistemology of Testimony* and provides a detailed discussion of the issues pertaining to information accuracy. The principles espoused in this paper are readily transferable to any source of information, be it formal or informal. In

this work Fallis (2004) describes four important criteria to be considered when verifying the accuracy of information: authority; independent corroboration; plausibility and support; and presentation.

The concept of authority is based on the consideration of the source of the information and while some sources considered authoritative are misleading, others may be entirely legitimate - the legitimate authority clearly being when the source is likely to provide accurate information (Fallis 2004). The perception that hierarchy is a consideration when seeking advice from others (Estabrooks et al. 2005b) and that those in senior positions are useful sources of information (Profetto-McGrath et al. 2007) has been described in the literature. However, in clinical practice, an assumption that those in authoritative positions yield accurate information may be erroneous. Similarly, assumptions of the quality of publications in an authoritative journal may be similarly misguided. This suggests that consideration of all criteria may be necessary to determine the veracity of information.

Corroboration, the use of multiple sources of information, has been suggested as a strategy that may be useful in determining the veracity of information. The work of Profetto-McGrath et al. (2007) clearly showed that Clinical Nurses Specialists use multiple sources of information to develop their knowledge. What is critical to consider, however, is the original source of information because if multiple sources acquired information from the same, but incorrect source, the information put forward would be corroborated but inaccurate.

In the context of nursing practice, the plausibility of information is of importance and consideration of the reasoning behind the claim can often provide a suggestion of the accuracy of the information. Plausibility can be determined by assessing the quality of research or through providing a physiological rationale for assessment or treatment. However, difficulty with applying the criteria of plausibility may be encountered if the person seeking information does not have the required knowledge to critically evaluate the rationale supporting the claim. A clear example of how plausibility can be problematic is provided by the difficulties experienced by many clinical nurses in locating, reading and applying

research to the clinical situation (Squires et al. 2007) and consequently they may not have the required knowledge to evaluate the plausibility of a study's findings.

Presentation of textual information can be evaluated in terms of the overall look of a document, spelling, grammar and the language used. Specific criteria for website presentation have been described by Fallis (2004). It is more difficult to qualify characteristics of presentation as they pertain to informal sources of information, such as other people. In evaluating informal sources of information clinicians may rely on the presentation of information to make a judgement about its value. This may be linked to the approachability, friendliness or perceived authority of an individual.

2.7 Conclusion

Information used by nurses to make clinical decisions can have an important impact on patient care and outcome. While there are many sources of information available to clinical nurses there is a distinct preference for the use of colleagues as a primary source of information. It is not fully understood why nurses preference other people as information sources or to what extent this promotes or inhibits an evidence-base to clinical practice. Although accuracy is an important aspect of any information source it is not clear how nurses critically evaluate information gained through informal strategies, such as the testimony of other people. The literature in the area of information use and information seeking by nurses has helped to illustrate important issues that require further exploration including identification of the type of information used to resolve clinical uncertainty.

CHAPTER 3

METHODOLOGY

3.1 Introduction

To understand the complexities surrounding evidence-based decision making within critical care nursing practice, a research approach was needed that allowed for exploration of this contemporary phenomenon within the context in which it occurs. The naturalistic paradigm is therefore the lens through which this study was conducted with qualitative research as the overarching research strategy. Case study method was the design framework used and detailed in section 3.3. Case study method relies on multiple methods of data collection and these are described in section 3.4. Data analysis in case study method is complex and the strategies used to analyse individual case data and subsequent cross case analysis are described in sections 3.5 and 3.6.

3.2 The naturalistic paradigm

The naturalistic paradigm is the lens through which this inquiry was conducted. Naturalistic inquiry contends that realities are multiple, constructed, and holistic (Lincoln and Guba 1985). This study sought to explore these multiple realities, not for the purpose of establishing causal links, but rather to raise important questions and enhance understanding of the phenomenon, that being information use in clinical decision making. Phenomenon ‘take their meaning as much from their contexts as they do from themselves’ (Lincoln and Guba 1985, p. 189). Conducting the research in the context of critical care nursing practice allowed for the consideration of time and situation, and the recognition that these would influence the individual shaping of reality for each participant. Realities are wholes that must be understood within their context so it was essential the research was conducted in the natural setting of the intensive care unit within the specific context of critical care nursing practice.

The naturalistic paradigm views the researcher and the object of inquiry as being inseparable and interactions between investigator and participants are

therefore viewed as advantageous for several reasons (Lincoln and Guba 1985). Importantly the interaction between the researcher and participant(s) helps achieve a balance between objective and subjective data (Rowan 1981), a process that is made easier if the researcher has experience in the area at a tacit, subjective level of knowing which thus enables symbolic representations to be fully appreciated (Lincoln and Guba 1985). Through extensive experience in critical care nursing I was able to draw on my understanding of this clinical world and inform my consideration of the context of practice, its images and symbols, and to take into account general and specific practice issues relevant to the study.

The purpose of research in naturalistic inquiry is to develop an idiographic body of knowledge that centres on a particular case (Lincoln and Guba 1985). Context is critical in determining naturalistic generalisation where ‘recognising the similarities of objects and issues in and out of context and by sensing the natural covariations of happenings’ (Stake 1978, p. 6) allows for judgements as to the possibility and extent to which meaning obtained from one situation can be transferred to similar circumstances occurring within different contexts. In this study the exploration of information use in clinical decision making within the context of two intensive care units allowed for a broader view of information use and the development of a deeper understanding of this phenomenon.

3.3 Case study method

This study was conducted with qualitative research as the overarching research strategy and with case study method as the design framework. Case study is well recognised as a method of inquiry in programme evaluation, education and social services research and is becoming more widely used in nursing studies (Estabrooks et al. 2005b, Thompson et al. 2001b, Zucker 2001).

Case study, as a research method generally refers to research that investigates a number of cases, that are normally constructed out of naturally occurring social situations (Hammersley 2000). The aim of case study research is to capture the uniqueness of the case and the unstructured data derived from it before qualitative analyses are undertaken (Hammersley 2000). The depth of investigation and need for understanding of the case requires information to be gathered and analysed

about many features of the case. It is the examination of the case from multiple aspects that locates and explains the case within the wider societal context. The generalisability of findings from case study research is different to the logical or analytical forms associated with statistical analysis that aim to generalise to a wider population. Instead case study method works towards ‘naturalistic generalisation’ (Stake 1978, p. 6) and the transferability of findings from one setting to another.

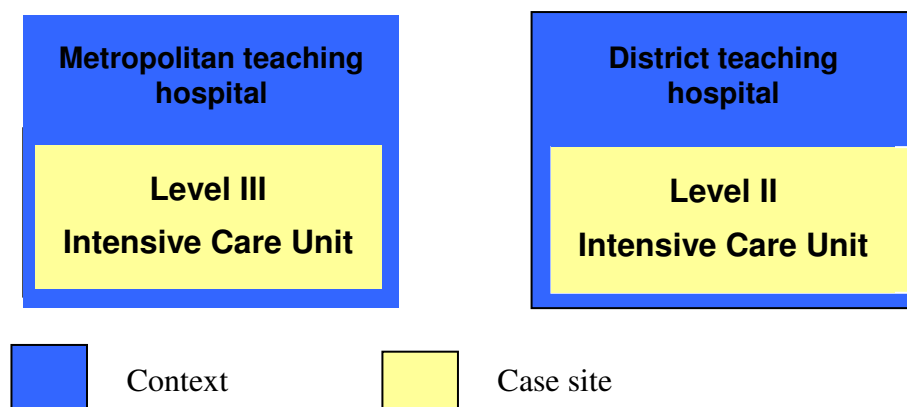
This study aimed to explore the information used to guide clinical decisions in the area of enteral feeding of the critically ill patient and to determine factors affecting critical care nurses’ adoption of an evidence-based approach to enteral feeding practice. The use of the case study method allowed for the detailed exploration of ‘how’ and ‘why’ questions about a contemporary issue - the use of information to guide clinical decisions – which was explored in the context of the intensive care unit, a natural setting over which there was little (research) control (Yin 2003).

Important in case study research is the development of a ‘logic of design’ (Platt 1992, p. 46) which must fit the style of the researcher and the case under consideration (Stake 1995). The framing of particular case studies is an important aspect that also influences the design. Various research designs are described by Yin (2003) and Stake (1995), with the different aspects of each design more able to accommodate the framing of a specific research question. Yin (2003) characterises case study designs as being exploratory, descriptive or explanatory. The research designs described by Stake (1995) include intrinsic and instrumental case study designs. Intrinsic case study design focuses on the particulars of a specific case; instrumental case study design however works to develop an understanding of a phenomena. Examining the information used to support clinical decision making in the area of enteral feeding practice of the critically ill will require that the research design is both descriptive (because there is no attempt to explain causal relationships) (Yin 2003) and instrumental to focus on the phenomenon of information use in clinical decision making rather than case-specific particulars (Stake 1995).

A multiple case study design (Figure 3.1) was used because the findings are often considered more compelling and the study more robust (Herriott and Firestone 1983). Using two case sites allowed for replication logic to be applied and in this study, case sites were specifically selected to allow for theoretical replication, where contrasting results are predicted for known reasons (Yin 2003). Hence, the two intensive care units selected for this study were located within the same Area Health Service but the research cultures in each intensive care unit were dissimilar.

In describing case study methods Yin (2003) stresses the importance of a rich theoretical framework which can be achieved through initially selecting cases for the purpose of literal replication (where similar results are predicted) and then following up with a series of cases aimed at theoretical replication, or obtaining different results for predictable reasons. The number of cases selected is ultimately at the discretion of the researcher and needs to be considered within the context and complexity of the individual study, resources available, experience of the researcher and available time. In this study two case sites were selected to provide the advantage of allowing comparison and contrast which may substantially increase the strength of the findings. Although additional case studies would have been beneficial, further extensions were beyond the scope of this project, (particularly as the research team was small, monetary resources limited and the study was constrained by a fixed time for completion). Complete descriptions of each case site are provided in Chapters 4 and 5.

Figure 3.1 The case study design



3.3.1 Study Issues

The main issue of relevance for this study was how information was used by critical care nurses to support clinical decision making. The complexity of the issue and the clinical context in which the issue was considered required strategies to limit the amount of data generated. For this reason, this issue was explored within the specific context of enteral feeding practice in the intensive care unit. To understand the phenomenon of information use in clinical decision making a number of key issue questions were identified so that data collection was focused on developing an understanding of the uniqueness and complexity of each case. The issue questions were premised on information seeking in the context of clinical uncertainty. The perspectives of clinical uncertainty and their description in the literature vary (p.19). For the purpose of this thesis the term clinical uncertainty is used to describe situations in which there is a limited knowledge base for practice either due to a lack of research-based information or, at times, because of personal knowledge levels. The issue questions included the following:

1. What decisions do critical care nurses make regarding enteral feeding practice?
2. What information do critical care nurses use to inform those decisions?
3. How do critical care nurses view the accessibility of information to inform clinical decision making?
4. How useful is that information in reducing the uncertainty in their clinical decisions?
5. How do senior nurse clinicians view the authority of the sources of information identified as most accessible and most useful?

Identification of specific issues and issue questions focused attention on what should be examined within the scope of the study (Yin 2003). Each question as detailed above required a specific method of data collection and analysis which are described in sections 3.4-3.6.

3.3.2 Case sites

Purposive sampling was employed to identify the case sites for this study. Case sites were selected to allow for theoretical replication and to enhance understanding of the phenomena. The use of multiple case sites increased the scope of data and allowed for the inclusion of as many realities as possible.

The case sites were two intensive care units selected from an Area Health Service in New South Wales, Australia. The case sites were determined on the basis of their research and development infrastructure, nursing contribution to research, information technology provision, level of clinical support and local university links, allowing for theoretical replication, that is the two cases would produce contrasting results but for theoretical reasons (Yin 2003). (Full descriptions of the two case sites are provided in Chapters 4 and 5). An important consideration in the selection of these case sites was their location and the willingness of the senior clinical nurses in each unit to support the project. Initial contact was made based on previously established professional relationships between senior clinical nurses at both case sites and the candidate. The nature of the study was explained and how data collection processes might impact on patient care was discussed. Importantly, the Clinical Nurse Consultants at each site agreed to champion the project and serve as an intermediary for nurses who may wish to discuss involvement in the study with someone other than the researcher.

3.3.3 Ethics

Prior to commencing the study approval was sought and obtained from the Human Research Ethics Committee (HREC) of the relevant Area Health Service in New South Wales. Ethics approval was received and submitted to the University of Sydney HREC for ratification. Final approval from the University of Sydney was granted in July 2005 (Appendix 2). Informed consent was sought from all those who participated in the study.

Although participants were provided details of the study so that they could provide informed consent, it is acknowledged that in qualitative research topics to

be addressed are emergent, making it difficult to specify areas which were discussed in detail. To accommodate the shifting nature of informed consent under these circumstances, all participants were informed at the beginning of data collection that they were free to withdraw participation at any time during the data collection process or at any point following completion. This assurance was also provided in writing.

Participants were made aware that information provided during the study would remain confidential. It was made clear to those who participated in the Think Aloud stage of data collection should situations arise in which patient safety was compromised, that confidentiality could not be assured but that they would be made aware beforehand of issues to be reported. Although this was never necessary, it was important to have a mechanism through which unsafe practice could be addressed should it be observed during data collection.

The collection of data involved not only individuals but the intensive care units and health care organisations in which they were located. Yin (1997) suggests that researchers 'struggle with the problem of divulging identities or maintaining the confidentiality and anonymity of sources and even of the case itself' (p. 71). Intensive care practice in Australia involves an intimate community of colleagues so in consideration of confidentiality, details of participating intensive care units and their location has been withheld.

A particular consideration during Stage 1 was the collection of data from the registered nurse during an episode of clinical care. For the purpose of ethical approval, the patient receiving this care was not considered a participant but nevertheless was entitled to decline the opportunity to be involved in the research. Prior to data collection, the study was explained to the patient and permission sought to proceed with data collection. For many patients, an inability to assess comprehension or to fully communicate with the researcher meant that family, if present, were approached to provide permission on behalf of the patient. Although the intensive care environment is frequently noisy, the researcher monitored patient's response to the nurse talking continually so that data collection could be terminated if it was perceived to be causing the patient distress.

The social nature of nursing practice meant that there were situations in which the voices of other health care staff may be recorded. Prior to beginning data collection all staff working in the immediate vicinity of the participating registered nurse were informed of the study and assured that their comments, if captured on audio tape, would not be transcribed or used in data analysis.

3.3.4 Data collection

Data collection at each case site was conducted in three stages, each building upon the other. To avoid confounding iterative data analysis, data collection for each case study was not conducted concurrently. Data were collected over a 12-month period, between 28 July 2005 and 13 July 2006. Stage one of data collection focused on the first two issue questions:

1. What decisions do critical care nurses make regarding enteral feeding practice?
2. What information do critical care nurses use to inform those decisions?

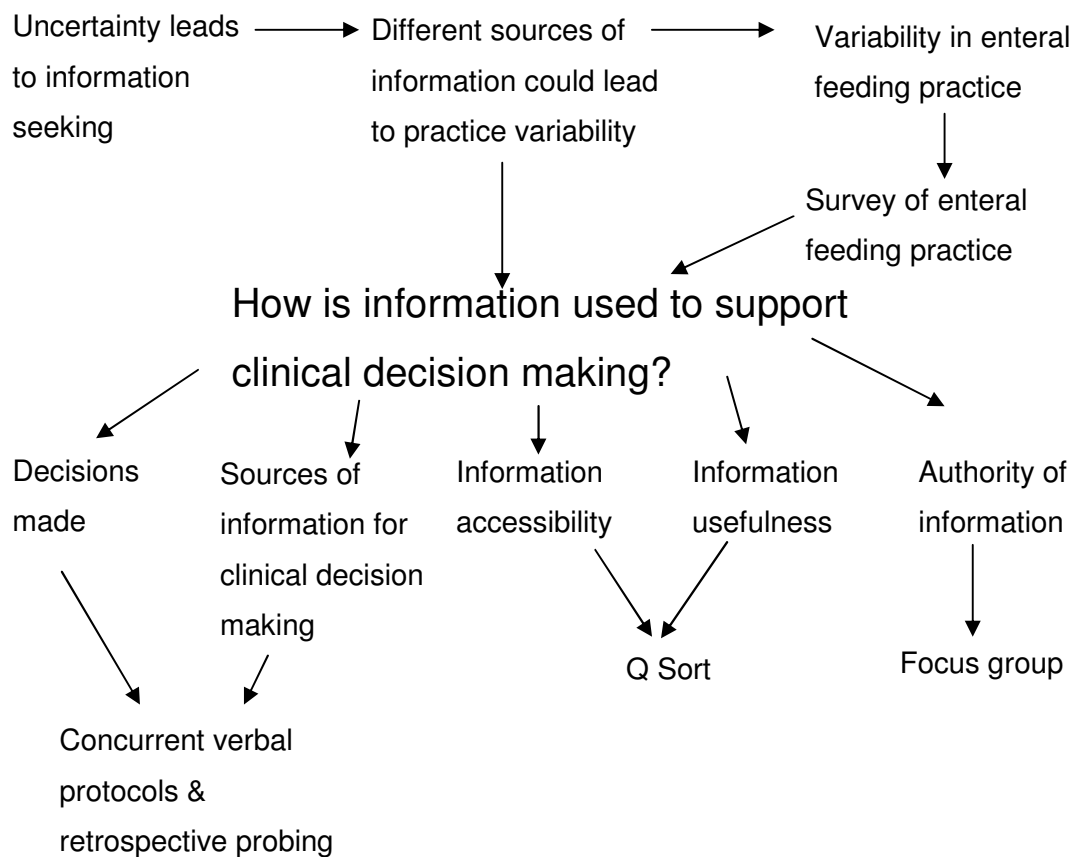
Concurrent verbal protocols and retrospective probing were used as the data collection method. To contextualise data obtained during collection of concurrent verbal protocols, non participant observation was also undertaken. Analysis of data from stage one was used to inform stage two data collection.

Stage two of data collection concentrated on the issue questions pertaining to the accessibility and usefulness of information to inform clinical decisions. Q methodology was used to systematically study participants' perspective of the accessibility and usefulness of information. During stage two data collection it became apparent that senior clinical nurses (Clinical Nurse Consultant, Clinical Nurse Educators, and Nurse Managers) in the intensive care unit substantially influenced the information available for clinical decision making. At this point the study was modified and a third stage was added to address this issue. Modification of the case study once the study has commenced is encouraged when further research questions are considered (Yin 2003) and in this situation, a change to the case study protocol was undertaken. This is consistent with the overall research

framework where naturalistic inquiry highlights the difficulty in identifying a priori the multiple realities that may occur (Lincoln and Guba 1985). The third and final stage of data collection was undertaken following modification of the study protocol. Data collection consisted of a focus group interview with senior nurse clinicians where the issue under consideration was the authority of information sources (as identified in stage two) and seen as most useful and accessible.

Important aspects of case study research are the links between the issue under investigation, the specific issue questions and the methods of data collection. Figure 3.2 shows the relationship between the issue, the issue questions, and methods of data collection.

Figure 3.2 A conceptual framework for data collection



The use of multiple methods of data collection was a major strength of this case study as it allowed for wider exploration of the phenomena and identification of converging lines of inquiry, adding strength to the case study (Yin 2003). This approach to data collection had potential advantages. These data collection methods complemented each other because there was a logical progression from each data collection method to the next, with each successive data collection method being reliant upon and building or expanding on the results of the preceding strategy. This resulted in strong links and some overlap between the issues being examined in each case. The breadth and scope of issues provided for a rich description of information use by critical care nurses, specifically relating to the management of enteral feeding. The convergence or divergence of results obtained for each data collection period therefore added to the trustworthiness of the results.

3.4 Data collection methods

Data collection methods differed for each stage of this study; stage one used concurrent verbal protocol with retrospective probing that was complemented by non-participant observation; stage two used Q methodology; and stage three used focus group interviews. Each of these data collection strategies and associated data analysis strategies are now described.

3.4.1 Concurrent verbal protocols

To address the question of what decisions critical care nurses make regarding enteral feeding practice, verbal data were collected from participants during a two-hour period of care at the beginning of the nurse's shift. This time frame was chosen in order to capture the nurse's initial and complete clinical assessment of a patient who was receiving enteral nutrition. To obtain data specific to this research question in the naturalistic setting of an intensive care unit, concurrent verbal processes and retrospective probing were used as data collection strategies.

The use of verbal data has been described extensively in the literature, particularly in the areas of psychology and education and is frequently used for

the purpose of finding cognitive processes during problem solving (Branch 2000). Closely linked to the general information processing model proposed by Newell and Simon (1972), concurrent verbal protocols (hereafter referred to as think aloud) as a data collection strategy has been used most frequently in decision making. Data are commonly analysed using verbal protocol analysis (Ericsson and Simon 1993) to demonstrate how information is structured during problem solving. As a data collection strategy, thinking aloud can also be useful for describing what information is concentrated on and it was used in this study to determine what decisions critical care nurses make regarding the management of enteral feeding as a component of critical care nursing practice. Think aloud data is produced continually while a participant undertakes an activity and is aimed at capturing the participant's thinking at that time. This type of data collection provides important insights into behaviour early in the investigation and consequently is useful when working in a new or emerging phenomenon (Young 2005).

Data elicited from verbal reports reflect both the processed information and the way in which it is processed (Kuusela and Paul 2000) and can be collected in the simulated environment (Jones 1989) as well as in the naturalistic setting (Aitken and Mardegan 2000). It has been suggested that having the participant engaged in a 'real' activity produces more reliable results than when they are asked to report on a hypothetical situation (Wade 1990) because the participant becomes completely immersed in what they are doing. For this reason, and because of the complexity and dynamic nature of patient care within an intensive care unit, collecting think aloud data for this study under simulated conditions was disregarded. The collection of these data within the naturalistic setting was essential to obtain information about the decisions critical care nurses made regarding enteral feeding as they happened within the real-world context of their practice. This allowed the complexities, intricacies and nuances of nursing practice to be captured.

The two main types of verbal data are think aloud (as concurrent verbal protocols), where the participant is instructed to speak aloud the thoughts that come into their short-term memory (STM) as they work, and retrospective verbal

protocols, such as interviews. While both techniques have advantages and disadvantages, retrospective verbal protocols ideally need to be collected immediately after the task, while data is still in STM. The need for immediate collection of data after the task renders this type of verbal report almost impossible to obtain when this technique is used in the intensive care environment. Because delayed data acquisition after the task was likely concurrent verbal protocols were used to avoid problems associated with faulty memory (Young 2005).

An important consideration when using think aloud as a data collection strategy is the type of activity being undertaken. Cognitive activity during think aloud can neither be too high (Brand 1984) or too low (Payne 1994). If the cognitive load is too low then little data may be elicited. Similarly, if the cognitive load is too high then the participant may feel the need to concentrate fully on the task and as a result little data is produced (Biemiller and Meichenbaum 1992). Within the context of this study participants undertook activities regularly encountered in the normal course of their work. During the process of data collection the clinical environment was monitored to detect any unusual events that may have contributed to an increase in the cognitive load. It has also been suggested that some participants may have a limited short-term memory capacity for talking aloud while undertaking a task (Wilson 1994). For this reason, all participants practiced the think aloud process for a 30-minute period the day prior to data collection to ensure they were familiar with the process and comfortable undertaking this form of data collection while also providing important clinical care.

Within the context of this study it was important to consider that some information critical care nurses may use may be difficult to verbalise, such as visual data (Young 2005). However, the nature of critical care nursing frequently requires the collection and consideration of visual, auditory, and olfactory information which is frequently disseminated among the health care team. Because of the nature of critical care nurses' work this was not considered a significant issue for this study. However, Young (2005) notes that automaticity of activity can also contribute to difficulty in eliciting verbal data. This is an

important consideration for this study, particularly when collecting data from experienced critical care nurses. To overcome this potential limitation, observation of the nurses' activity was undertaken during the think aloud process to ensure that all activity was captured and to contextualise the verbal reports.

The validity of verbal data has also been questioned. It is unclear whether the information provided by thinking aloud is an accurate reflection of thinking (Crutcher 1994) because while thinking aloud is able to access information held in short-term memory, it is not able to access the cognitive processes that never reach consciousness (Wilson 1994). However, Young (2005) has identified that using multiple methods of data collection, such as observation and retrospective probing, may be useful to gain further insight and both these techniques have been incorporated into this study.

3.4.1.1 Process of data collection for think aloud

The process of data collection for Think Aloud required the participant to wear a lapel microphone attached to a recorder during a two-hour period of care. Instructions were given for the participant to verbalise their thought processes without providing an explanation or rationale, as this may require the participant to consider information not required to perform the task and thus change the sequence of thoughts (Ericsson and Simon 1993). All participants underwent a 30-45 minute practice session the day prior to formal data collection. This served to familiarise the participant with the process of think aloud and to determine if issues of reactivity, namely the ability of the participant to think aloud and care for a critically ill patient simultaneously, would be encountered. The practice session also provided an opportunity for the participant to become familiar with the researcher. The developed familiarity contributed substantially to the ability of the participant to undertake data collection in a manner where they were no longer self-conscious about performing the 'think aloud' or being observed by the researcher.

During this two-hour period of data collection the researcher observed the participant while they cared for a critically ill patient receiving enteral feeding. Detailed data were collected by the researcher who verbally recorded all visible

activity. This data was used for the purpose of contextualising think aloud data as well as identifying any data that may have been omitted because the participant stopped talking while performing particular tasks.

Data obtained from think aloud and observation were transcribed verbatim immediately following data collection. Based on the think aloud and observation data, an individual interview schedule was developed specific to data provided by the participant. The interview schedule contained 19 pre-defined questions specific to the use of information in supporting clinical decisions (Appendix 3). These questions were only incorporated into the interview if the issue did not arise spontaneously. All participants were interviewed for 1-1.5 hours to augment the think aloud data and obtain the fullest possible description of information use during the data collection period. To facilitate the participant's recollection of the period of care all interviews were scheduled to occur before the participant cared for another critically ill patient and within four days of data collection necessitating data collection prior to a participant's rostered day off. Prior to the interview the participants reviewed a copy of their think aloud transcript. Interviews were transcribed verbatim.

3.4.1.2 Recruitment of participants

All registered nurses employed at each case site were sent a letter informing them of the study and inviting them to participate. Posters were also placed strategically in the intensive care unit and contained brief information about the study and a contact number. Prior to distributing the letters or placing the posters, a meeting was held between the investigator and the Clinical Nurse Consultant, Nursing Unit Manager and Clinical Nurse Educators where the purpose of the study and procedure for data collection was detailed. This ensured that questions regarding the study could be addressed should the participants wish to obtain further information about the study without directly approaching the researcher.

Inclusion criteria for this aspect of the study were minimal and included the participants being a registered nurse with at least one year experience in intensive care and working a minimum of two days per week. Six participants (at each case site) were required for this part of the study. As there were more potential

participants wanting to participate in the research than was required, recruitment into the study was sequential.

3.4.1.3 Data analysis

Analysis of think aloud and interview data occurred in two stages. Initially the data were subject to content analysis to identify sources of information that were accessed by or referred to by the nurses during their two-hour period of care. These data were subsequently used to inform stage two of the study.

Data were then analysed to identify what enteral feeding-specific decisions critical care nurses made during the first two-hours they nursed a critically ill patient. An inductive approach to data analysis, where ‘detailed readings of raw data to derive concepts, themes, or a model through interpretations made from the raw data...’ was used by the researcher (Thomas 2006, p. 238). Without the restraints imposed by structured methodologies, this approach allowed for research findings to emerge from the raw data. This analytic strategy reflects the general approach to qualitative data analysis proposed by Miles and Huberman (1994) and is similar to their description of pattern coding (p. 69-71). The key difference is that Thomas (2006) provides more extensive detail for reduction and display of data, and the inductive approach to data analysis does not involve determination of causes or explanations and relationships among people that is typically evident in pattern coding (Miles and Huberman 1994).

The same technique was applied to analysis of data pertaining to information used in clinical decision making. To assist in the analysis of these data Fallis’ (2004) approach to determining information veracity (p. 23) guided data analysis where the concepts of authority, independent corroboration, plausibility and presentation were used for the purpose of first-level descriptive coding.

3.4.2 Q Methodology

Q methodology is used for the study of human subjectivity, such as a person’s opinion, beliefs or attitudes (Barbosa et al. 1998). Q methodology is heavily influenced by logical positivism (Dennis 1986) and combines both qualitative and quantitative analyses to study subjectivity in an objective, orderly and scientific

manner. Q methodology is based on the mathematical-statistical tool of factor analysis but unlike R Factor Analysis which correlates variables (such as tests or traits) being investigated, in Q it is the individuals that become the 'variables' and are correlated in a by-person factor analysis (Barbosa et al. 1998). Importantly, this subjectivity is always self-referent in that it reflects a person's own particular frame of reference (McKeown and Thomas 1988). It is the study of the complex underlying structure of subjective views that assists in understanding subjective topics. Unlike R methodology which is grounded in the study of individual differences, Q seeks to understand the similar beliefs or attitudes held by particular individuals (Dennis 1986). In this study participant's opinion on the accessibility and then the usefulness of various information sources was sought.

3.4.2.1 The Q Sample

The Q sample was a collection of stimulus items that are presented to participants for rank ordering (McKeown and Thomas 1988). In this study participants were asked to rank order information sources in response to two different conditions of instruction. Information sources were acquired through naturalistic sampling, where sources of information identified during think aloud and retrospective probing formed part of the sample. Using naturalistic sampling was advantageous because the process was primarily self-referent however there was the possibility that this type of sampling would not include all relevant items (McKeown and Thomas 1988). For this reason, a more structured sample was sought and accomplished through a document audit at each case site. Items obtained through naturalistic sampling, together with those obtained through the document audit formed the final Q sample. A representative sample of the items was obtained by limiting items (Barbosa et al. 1998) to types of information sources (for example, journal article or poster) as opposed to specific information sources (for example, a journal article on enteral feeding). Individual Q samples were developed for case site 1 (Appendix 4) and case site 2 (Appendix 5). Although not intended, through the process described above 56 items of information were identified for each case site.

3.4.2.2 The P Sample

While most attention is given to development of the Q sample, the person sample (P-sample) is also of importance. Q methodology is consistent with qualitative methodology where developing an understanding of an issue is of great importance and can be achieved through intensive examination of the self-referent perspective of individuals (McKeown and Thomas 1988). For this reason the P sample is usually selected to provide broad and comprehensive perspectives of an issue and therefore only requires enough participants to be able to establish the presence of a factor (van Exel and de Graff 2005). For this stage of the case study all registered nurses working directly in each clinical care were invited to participate.

As a guide the P sample is normally smaller than the Q sample (Brouwer 1999). According to van Exel and de Graff (2005) the aim is to have four or five people defining each viewpoint with approximately two to four viewpoints identified. Based on these recommendations, and assuming a maximum of four viewpoints, approximately twenty completed Q sorts were required from each site. At each site there were sufficient registered nurses working in the clinical setting for the Q sort to be feasible (case site 1 n= 87; case site 2 n=32), although at case site 2 a significantly higher response rate would be needed to obtain twenty completed Q sorts because fewer staff were employed.

3.4.2.3 Q sorting and conditions of instruction

Q sorting is the process whereby participants present his or her perspective on a topic by sorting, in rank order, the Q sample according to a specific condition of instruction. In this study the Q sample was used with two variations in the condition of instruction. The first Q sort was for determining participant's perspectives of the usefulness of information and the second was for determining the accessibility of information. Instructions on how to complete each Q sort were provided to participants (Appendix 6 and 7).

The first condition of instruction presented the following clinical scenario to the participant:

You are looking after a 45 year-old male who was admitted to the ICU following a motor vehicle accident in which he sustained multiple long bone fractures and chest trauma. The patient has been fluid resuscitated and is currently receiving inotropic agents for haemodynamic support. Enteral feeding was commenced at 30 ml/hr with instructions to increase the rate of feeding to a maximum of 100 ml/hr as tolerated. The patient's current rate of feeding is 80 ml/hr and the most recent gastric residual volume is 275 ml. You refer to the recently introduced enteral feeding protocol and note that a gastric residual volume over 200 mls is considered high. You discuss this with a colleague who describes other ICUs using different cut off points for high gastric residual volumes. You both agree that there is some inconsistency in how a high gastric residual volume is defined and wonder about this variability in practice.

The participants were then asked to sort the following sources of information according to those which were felt to be most **useful** through to those which were least **useful** in informing practice.

The second condition of instruction was as follows:

*Reflect on a instance where you were faced with a situation you were uncertain about. This may be in relation to enteral feeding or, if you cannot recall a situation of uncertainty related to enteral feeding, another clinical situation where you felt you needed further information to aid your clinical decision making. Think about what sources of information would be most **accessible** to you in helping to resolve your uncertainty.*

The participants were then asked to sort the sources of information according to those which were felt to be most **accessible** through to those least **accessible** for informing practice. In completing the Q sort, a forced-free distribution was used with a prescribed number of items for each rank but where the participant was free to place an item anywhere within that distribution (Figure 3.3). The range and number of items at each interval is predetermined, it is the subject that determines the meaning of the continuum and thus the notion of operant

subjectivity is maintained (McKeown and Thomas 1988) because the participant controls the contextual significance of each item.

Figure 3.3 The Q sort distribution

	Agree					Uncertain			Disagree				
Value	+6	+5	+4	+3	+2	+1	0	-1	-2	-3	-4	-5	-6
No of statements	1	2	3	4	5	8	10	8	5	4	3	2	1

Those who participated in the Q sort process were free to complete the activity at a convenient time and place. To improve the number of Q sorts completed, a system was devised that allowed participants to easily complete the Q sort in the workplace. A single piece of paper (42cm x 42cm) was provided for each Q sort; the first was labelled with the descriptor ‘most accessible’ at the top and ‘least accessible’ at the bottom. The second piece of paper was labelled ‘most useful’ at the top and ‘least useful’ at the bottom. On each piece of paper there were discrete boxes onto which the Q sample items could be adhered. Participants were instructed to place the Q sample items (printed on adhesive labels) in a distribution that most reflected their viewpoint. When the participant was satisfied that the distribution accurately reflected their viewpoint they were asked to remove the backing from the adhesive strip and to fix the Q sample item in place.

3.4.2.4 Piloting the Q sort process

Prior to collecting data from study participants the Q sort process was piloted. The Q sort pilot was conducted within a Faculty of Nursing with 16 nurse academics. Each academic was provided with the Q sample on adhesive labels, a 42cm x 42cm piece of paper labelled with ‘most useful’ at the top and ‘least useful’ at the bottom. The nurse academics were provided with the first condition of instruction and scenario as described in the previous section. The Q sort was completed individually and the length of time to complete noted. Feedback was

provided verbally, and in some cases, by writing on the instrument. Feedback, which was specifically related to instructions for completion and detail within the scenario, was considered and incorporated into the final condition of instruction and scenario.

3.4.2.5 Statistical analysis

To provide an overall view of the accessibility or usefulness of information sources, data were initially analysed using descriptive statistics. Information sources ranked from +6 to +2 were considered accessible or useful, those ranked from +1 to -1 were considered uncertain, and those ranked from -2 to -6 were considered not accessible or not useful. The frequency to which information sources fell into each of the above categories was determined.

Data were subjected to Q factor analysis using PQMethod software (Schmolck 2002). The psychometrics of Q involve the correlation and factoring of people where the common unit of measurement is self-significance (McKeown and Thomas 1988) and where the Q sorts express the viewpoint of particular sorters (van Exel and de Graff 2005). Q statements were entered sequentially. The size and shape of the curve was included as input. Individual Q sorts were entered and data analysis began by producing a correlation matrix before data was subjected to factor analysis. Two factor analytic techniques, centroid factor analysis and principal component analysis, can be employed in Q methodology and there is little difference in the factor structures produced by these two techniques (McKeown and Thomas 1988). Principal component analysis produces eigenvalues, or how much a particular factor contributes to the total variance (Donner 2001), and was the factor analytic technique employed to identify the number of natural groupings of Q sorts. Eigenvalues were calculated based on the sum of a factor's squared loadings and values greater than 1.0 were considered to be significant. This criterion was used to identify the number of factors to include in the initial factor rotation. It is important to note that the use of Eigenvalues alone in determining the number of factors to rotate can be problematic as the more factors are rotated, the more dispersed they become. Consideration was also

given to contextual factors associated with the factor structures when determining the optimal number of factors to rotate (McKeown and Thomas 1988).

PQMethod software allowed for factors to be rotated judgementally or analytically, using orthogonal rotation (Varimax) method (Schmolek 2002) and helped to identify simple structure (McKeown and Thomas 1988). As no particular participant held special interest, judgemental rotation was not necessary. Varimax rotation maximised the variance between each of the factors (Donner 2001) and was used to help further define the factor structure.

Factor loadings were reproduced following rotation where loadings of 1.0 (or -1.0) indicate perfect agreement. For analytic purposes, loadings greater than 0.4 were considered strong and those at 0.8 or greater were considered very strong (Donner 2001). Data were analysed for cross-loadings, that is, where an individual loaded strongly (greater than 0.4) on to one or more factors. Where cross-loadings were present, the number of factors rotated was increased and data re-analysed. If cross-loadings continued, consideration was given to excluding a participant from analysis in order to produce a cleaner factor structure and to minimise producing excess subgroups and minimising the number of consensus statements in the data (Donner 2001).

How participants loaded onto a particular factor was determined through the process of pre-flagging, an automatic process in the PQMethod software that identifies participants loading cleanly onto a particular factor. Data were also assessed manually to determine whether adjustments to the pre-flagging were required based on nuances in the data.

Following factor rotation, data were analysed using the PQMethod software. The software generates 12 output items during the QANALYZE process, although not all are necessary for data interpretation. Table 3.1 provides a summary of the items that are useful for interpretation of the data.

Table 3.1 PQMethod data analysis items (Schmolck 2002)

Item	Description
Correlation matrix	Shows correlation between individual pairs of Q-sorts
Unrotated factor matrix	Produces factor loadings before rotation. For principal component analysis, eight factors are produced with associated eigenvalues and the percentage variance for each factor
Rotated factor matrix	Produces item loadings and percent variance explained for the number of factors selected for rotation.
Correlations between each factor	Demonstrates how similar each factor is to other factors
Normalised factor scores	List all statements for each factor in descending order of ranked importance. Useful in determining the perspective of participants who load to a particular factor. The Z score shows how far from the overall mean (measured in standard deviations) each item is for the group
Array of differences between factors	Allows for per-item comparisons between each factor
Factor Q-sort values	Z scores are translated back into the original scale for the sort. Data is presented in order of statement number, then by degree of agreement between groups
Factor characteristics	Reports the number of defining variables that are statistically distinct from other groups and other indexes of how well the factor holds together
Distinguishing characteristics	For each factor, highlights contention statements that participants have ranked significantly differently from other subgroups. Helps to define the key differences among subgroups
Consensus statements	These items do not distinguish between any pair of subgroups

Data were interpreted by first considering the Factor Q-sort values that provide a snapshot of each group's perspective on the issues of usefulness and accessibility. To get a sense of relative priorities of groups, Normalised Factor Scores were considered so that items ranked as more/less important could be identified. Finally, distinguishing and consensus statements in the sort for each group were analysed to determine distinguishing characteristics for each group.

3.4.3 Focus groups

A focus group was used at each case site to explore senior nurse clinicians' perspectives of information sources identified during the Q sort process as being accessible and useful in resolving clinical uncertainty by nurses providing direct patient care. Similar to other interviewing strategies, the focus group allowed for exploration of group interpretations of information use within each intensive care unit. Egalitarian cooperation was encouraged to invite candid and spontaneous discussion that might not occur during individual interviews (Stevens 1996), a level of discussion that might also be difficult to establish in participant observation (Morgan and Spanish 1984). Importantly the focus group allowed for individual experiences and perspectives to be presented and for the group to then discuss and attempt to collectively make sense of the issue (Morgan and Spanish 1984). In addition to concentrating on the issue of information use by clinical nurses in clinical decision making, the focus group also provided an opportunity to observe interaction between individuals as issues relating to information use in decision making were discussed.

3.4.3.1 Participants

Focus group participants were drawn from the group of senior nurse clinicians and included the Clinical Nurse Consultant, the Nursing Unit Manager and Clinical Nurse Educator(s) for each intensive care unit. While specific roles and responsibilities of these individuals differed (see Glossary), as a group they were collectively responsible for clinical practice improvement and education of nurses working in the intensive care unit.

Individuals holding these positions at the time of data collection were sent a letter inviting them participate. Ideally focus groups should involve six to twelve

participants (Stevens 1996) however this was not possible at case site 2 where only one Clinical Nurse Educator was employed in the intensive care unit. Success in conducting focus groups with fewer numbers of participants has been described in the literature (Strong et al. 1994). Importantly, homogeneity of the group was assured as all group members were instrumental in influencing information available in the intensive care unit with their individual roles and perspectives providing depth to the data.

3.4.3.2 Setting

Each focus group was conducted in a neutral setting outside of the respective intensive care units (Powell and Single 1996). While the ability to hold the focus group outside the health care setting was limited by the clinical commitments of the participants, an area within the hospital was chosen that had no special significance to any individual (Powell and Single 1996). The focus groups were not conducted in the natural setting (the intensive care unit) however discussion was contextualised to intensive care nursing practice.

3.4.3.3 Facilitation

Participants were initially asked to consider the information sources regarded as accessible and useful by clinical nurses. This provided direction for the participants while also eliciting information of particular relevance to the project. Groups were encouraged to self-manage and consulted the researcher as required. Morgan and Spanish (1984) identify that self-managed focus groups have the potential to either stray from the topic or come to a dead end so the researcher closely monitored the group, and assumed a more active role in facilitating the group as required. Group processes were monitored closely so that passive group members were not inhibited or influenced by others (Stevens 1996, Webb and Kevern 2001).

The assumption of expertise held by the facilitator may be detrimental to the disclosure of participants (Sim 1998). While the facilitator (in this case the researcher) had a specific interest in the topic under exploration, it is essential that participants knew that it was their viewpoint that was of interest. In particular, maintaining dialogue between the group members rather than between them and the facilitator was essential (Carey 1994).

3.4.3.4 Group interaction

Using a focus group as a data collection strategy was particularly advantageous as it provided an opportunity to observe senior nurse clinicians as they put forward individual viewpoints on accessibility and usefulness of information as it pertained to clinical practice in their workplace. The group then attempted to find common or divergent viewpoints. During the process individual perspectives and commonalities of individual experiences were highlighted (Stevens 1996). This iterative process, whereby participants built on experiences, interpretations and evaluations of others, was a major strength of this data collection strategy (Stewart and Shamdasani 1990).

While the obvious interest was what participants chose to discuss in the group, it was equally compelling to consider what was avoided (Morgan and Spanish 1984). An important consideration for the conduct of focus groups in this study was the hierarchy of the health care system where the Nursing Unit Manager had line management responsibilities for the Clinical Nurse Educator(s). Similarly, occupational seniority was also a consideration whereby the Clinical Nurse Consultants were in a position to lead and influence the Clinical Nurse Educator(s) (Morgan and Krueger 1993). Participants of each focus group worked collectively in one intensive care unit and consequently interpersonal relationships may have also influenced responses by participants.

Questioning within the group was an important point of observation that highlighted different frames of reference used by group members. Requesting and providing comparisons highlighted areas of agreement and disagreement and were important in uncovering implicit theories held by participants (Morgan and Spanish 1984). The manner of questioning was important to note as questions posed could imply that the person being questioned was not aware of omitted information (Morgan and Spanish 1984).

Discourse was an important aspect of group interaction however equally important was the 'impact of the group dynamics and specific comments, jokes, anecdotes, questions, censorship, changes of mind, deferring to the opinion of others...' (Robinson 1999, p. 909). Non-verbal communication was also of interest and reinforced individual perspectives and attitudes towards others and their opinions.

3.4.3.5 Data analysis

The approach to analysis of focus group data follows a similar process to that used for other types of qualitative data (Sim 1998, Webb and Kevern 2001). For this study an inductive approach to data analysis has been used (Thomas 2006). There are, however, specific strategies for analysis of focus group data that help uncover the complexities of issues discussed and these were incorporated in the data analysis strategy. First, statements were examined within the context of the broader discussion, a strategy that Knodel (1993) highlights as a means of facilitating interpretation. Attention to group interaction was also incorporated into data analysis and is viewed as a critical aspect of analysing focus group data (Morgan and Spanish 1984, Webb and Kevern 2001). Further, attention to issues of consensus and dissent, described by Sim (1998) as having significant potential to impact data quality, were monitored. For example, those less confident and assertive members may demonstrate reluctance to express their views. The impact of this suppression may falsely lead to an interpretation of consensus simply because dissent is not evident. Alternatively the ability for group members to openly discuss differences in opinion, what Kitzinger (1994) describes as 'argumentative interactions', may be lost and along with it the richness of data that may have resulted.

Analysing group interactions was important however few publications provide guidance for analysing this aspect of the data (Webb and Kevern 2001). Stevens (1996) has suggested specific questions to consider during analysis of focus group data (Table 3.2) and these were incorporated in analysis of focus group data obtained in this study.

Table 3.2 Suggested questions for analysing group interaction

No.	Question
1	How closely did the group adhere to the issues presented for discussion?
2	Why, how and when were related issues brought up?
3	What statements seemed to evoke conflict?
4	What were the contradictions in the discussion?
5	What common experiences were expressed?
6	Were alliances formed among group members?
7	Was a particular member or viewpoint silenced?
8	Was a particular view dominant?
9	How did the group resolve disagreements?
10	What topics produced consensus?
11	Whose interests were being represented in the group?
12	How were emotions handled?

3.5 Analysis of individual case site data

The approach to individual case site data analysis followed the general analytic strategy of developing a descriptive framework for the case study (Yin 2003). A process of data triangulation was used. First, data obtained through each of the three data collection methods (think aloud, observation and interview; q methodology; focus groups) were individually analysed and summarised. This data was then combined and considered in relation to the characteristics specific to the case site. Data were categorised and tabulated to assist the use of pattern matching as an analytic technique. In an iterative fashion, data were recombined to develop case-specific findings.

3.6 Cross Case Synthesis

Cross-case synthesis of data was used to compare and contrast data from both case sites. An idiographic interpretation of data from each case site and inductive approach to data analysis facilitated the identification of the multiple realities found in the data and informed decisions about transferability by more fully describing the setting and

assisted in the identification of mutually shaping influences. This synthesis allowed the theory to be grounded in the data and was more responsive to the contextual values of the study (Lincoln and Guba 1985).

The approach to cross-case analysis (synthesis) described by Stake (2006) was used as a strategy to analyse findings from both case sites in relation to the research questions proposed. In analysing the data both common and atypical findings from each case were considered in relation to the research questions so that the meaning of the data was enhanced. The cross-case synthesis involved combining findings from each case and followed these steps:

1. Reading of each case site data summary to identify relevant case-specific findings
2. Grouping similar findings from both cases and naming as a merged finding
3. Identifying special findings – those findings that do not merge well but are worth mentioning
4. Considering the prominence of the case by the number of times a finding is represented within a merged findings category
5. Evaluating whether sufficient evidence exists for each merged finding to warrant discussion
6. Consideration of the relationship between established themes and merged findings, including the importance of each merged finding in understanding the theme.

Throughout data collection and analysis, attention was given to the trustworthiness and validity of data.

3.6.1 Trustworthiness and validity

In the naturalistic paradigm the conventional positivist criteria commonly used for determining the trustworthiness of data (internal and external validity, reliability, and objectivity) are not workable. Trustworthiness of data was assessed using criteria

described by Lincoln and Guba (1985) for assessing credibility, transferability, dependability and confirmability. Strategies are developed to increase the trustworthiness of data but broad application of findings is applied tentatively because the nature of naturalistic inquiry results in multiple realities that are context laden.

Methods have been specifically employed in the analysis of individual cases and the cross case analysis to ensure validation of the study. The approach to this study supports the view of multiple realities and is unable to establish beyond contention what the 'best' view might be. With a complex phenomenon such as information use in clinical decision making, establishing a consensus as to what exists is not possible, however an obligation on the part of the researcher to employ strategies to minimise misrepresentation and misunderstanding remains (Stake 1995).

In an effort to ensure data were accurately represented and that there was logic behind how data were understood four triangulation protocols were used. First, data source triangulation was used through implementation of a multiple case study design to see if the phenomenon was similar or different at the two case sites. Methodological triangulation was accomplished by employing multiple methods of data collection. As described by Campbell and Fisk (1959)

The achievements of useful hypothetically realistic constructs in a science requires multiple methods focused on the diagnosis of the same construct from independent points of observation through a kind of triangulation. (p. 81)

Investigator triangulation was used where the researcher initially presented data and its interpretation to the Primary Supervisor. Following discussion of proposed and alternate interpretations, a revised analysis was presented to the Associate Supervisor. Discussion and clarification was then used to inform the final data analysis. Because the researcher and each of the supervisors brought with them a particular theoretical viewpoint a process of theory triangulation was facilitated and the interpretation was triangulated to some degree (Stake 1995).

3.7 Conclusion

Exploring information use by critical care nurses required an approach that was sympathetic to the multiple realities of this phenomenon. Through the lens of

naturalistic inquiry and using case study method as a research framework these multiple realities were able to be explored. Case study method, with its multiple methods of data collection, allowed for a deeper understanding of information use.

CHAPTER 4

CASE SITE 1

4.1 Introduction

This chapter details the findings from case site 1. A full description of this case site is initially provided and details characteristics of this intensive care unit including the level of clinical support available, the research and development infrastructure, nursing contribution to research, information technology provision, local university links and information sources available to clinicians. The study participants for each phase of data collection are then described. Section 4 presents the findings of data analysis for this case site including the major themes of making decisions, information used to support clinical decisions, the veracity of information and the nature of inquiry.

4.2 Case site 1 description

Case site 1 was an intensive care unit in 740-bed acute general teaching hospital. The hospital was accredited by the Australian Council on Healthcare Standards and was located in Area Health Service in New South Wales, Australia. This hospital serves a population of 760,000 and was a major referral hospital for a number of specialties including neurosurgery, major trauma, cardiac and spinal services. The hospital was a university affiliated teaching hospital which provides clinical placements to both nursing and medical students. Strong links to local universities contributed to collaborative research and teaching endeavours.

4.2.1 The intensive care unit

Case site 1 had a Level III intensive care unit with 13 funded beds and the capacity to provide care for up to 19 patients. This unit catered for adult critically ill patients with a range of Acute Physiology and Chronic Health Evaluation (APACHE) III diagnoses, and was able to provide care for patients with postoperative and non-operative neurological, cardiothoracic, trauma and severe burns clinical presentations,

who required specialty intensive care services. The intensive care unit was a referral hospital for patients requiring tertiary level intensive care services from the Far North Coast of New South Wales.

The intensive care unit was managed by a Level 3 Nurse Unit Manager who was supported by a registered nurse Team Leader on each shift. Overall nursing management for all critical care services was provided by a Level 5 Nurse Manager. The unit was staffed with one Clinical Nurse Consultant and four Clinical Nurse Educators who provide support for education, research and clinical practice. Full descriptions of these roles are provided in the glossary (p.xv). There was a Professor of Critical Care Nursing located within the clinical area with links to the intensive care unit.

The intensive care unit was staffed only with registered nurses. There were 77 registered nurses employed in this unit representing a full-time equivalent (FTE) of 74. A total of 52 registered nurses (68%) had completed a post-registration or postgraduate specialty qualification in critical care. Registered nurses in the unit were responsible for the supervision of patient service assistants, undergraduate student nurses and registered nurses undertaking postgraduate critical care specific education.

The Head of Department of the intensive care unit was a medical specialist in intensive care and supported by a medical team of four Senior Staff Specialists, and four Staff Specialists, all of whom are Fellows of the Joint Faculty of Intensive Care Medicine. Further medical coverage was provided by four Senior Registrars and 16 Resident Medical Officers. Ancillary support was available in the areas of social work, dietetics, pharmacy, technology and equipment, and epidemiology.

4.2.2 Level of clinical support

Nursing staff in the intensive care unit were supported by the Clinical Nurse Consultant and Clinical Nurse Educators. The Clinical Nurse Consultant had primary responsibility for nursing practice development within the unit and worked collaboratively with the Clinical Nurse Educators to provide unit, hospital and Area Health Service based education. An introductory course in critical care nursing which ran over 12 weeks and involved 10 face-to-face study days was provided to nurses. In

addition to facilitating the introductory course in critical care nursing the Clinical Nurse Educators provided support to registered nurses undertaking postgraduate specialty education at Graduate Certificate, Graduate Diploma and Master's level. Additional clinical support was provided by a full-time hospital scientist and a full-time registered nurse who were responsible for computing, scientific and technical support in the intensive care unit.

4.2.3 Research and development infrastructure

The intensive care clinical research program at this hospital had a sustained history of conducting quality research recognised worldwide. While the research program traditionally consisted of medical researchers and consequently medically dominated research activity, the nursing research component of the program had been growing significantly for the past decade. The track record of investigators within the unit was impressive. From 2004 to 2005 the unit was involved in a total of 28 research projects: seven unfunded, 17 funded through competitive research grants; and four funded through industry support. Nine of the 28 research projects were nurse-led. Total funding secured for these projects was in excess of 19 million dollars; \$452,000 which was allocated for nursing research. Nurses published 11 of the 46 peer-reviewed publications produced by this clinical area in the previous 24 months.

The intensive care unit had close links with local universities and the Area Health Service funded a Professor of Critical Care Nursing. The Professor of Critical Care Nursing contributed to research and development within the hospital setting as a member of the Nursing and Midwifery Research Committee. In the university sector the Professor of Critical Care Nursing was a member of the Faculty Research Committee and Chair of the Research Development Subcommittee. Seven Intensivists had clinical appointments at a local university; one at an Associate Professor level, one at a Senior Lecturer level and five at the Lecturer level.

4.2.4 Nursing contribution to research

Nursing research within the unit was primarily driven through the Critical Care Nursing Professorial Unit. The Critical Care Nursing Professorial Unit included the Professor of Critical Care Nursing, a Research Officer and an Administrative Assistant

(0.4 FTE). Additional research staff were employed and funded by specific research projects and included a Senior Research Fellow (0.5 FTE) and Research Assistant (0.4 FTE). In addition to the activities described previously, the Professor of Critical Care Nursing was available to any nurse within the Area Health Service for consultation.

The Clinical Nurse Consultant held a postgraduate research degree at a Master's level and played an important role in nursing research both as an investigator and as a champion for nursing research in general. The Clinical Nurse Consultant was instrumental in fostering a research culture throughout the hospital and served as Chair of the Nurses' and Midwives' Research Interest Group. The Clinical Nurse Consultant was responsible for overseeing the intensive care unit in-service program which ran every weekday. Journal club, held once per month, was conducted within the in-service program and was facilitated by the Professor of Critical Care Nursing. Two research nurses were employed in the unit as clinical trials nurses specifically for the conduct of medical research.

4.2.5 Information technology (IT) provision

The intensive care unit was physically divided. The majority of patients were located in two large rooms, each with six bed spaces. A three-bed isolation area and two burns rooms provided an area to care for patients who required isolation. Computer access was available in all areas except for the two burns rooms. Nurses working in the burns rooms accessed IT by exiting the room and using services provided in other areas of the intensive care unit. The ratio of available computers to beds was 1:3.

An intensive care specific website (intensive care unit homepage) that featured a synopsis of recently published research in the area of critical care was available to all staff. Numerous links to additional websites, including PubMed, the Cumulative Index of Nursing and Allied Health Literature (CINAHL), and evidence-based practice websites were accessible through the intensive care unit homepage. Links to university libraries were also available. The hospital library had extensive access to online information including 199 journals. While the library had few online textbooks all computers had access to NSW Health's Clinical Information Access Project through

which additional online journals and textbooks could be accessed. Through the intranet nurses could access hospital and intensive care unit specific policies and procedures, clinical practice guidelines, protocols and competency documents.

4.2.6 Local university links

Two local universities were linked to the hospital, both with well established nursing and midwifery faculties that provided education at undergraduate and postgraduate levels. Postgraduate programs were offered to a doctoral level through coursework and research.

4.2.7 Information sources available to clinical nurses

Within the intensive care unit there were several different sources of print and electronic-based information available, some of which were specifically related to enteral feeding (Table 4.1). In the intensive care unit there were few print-based sources of information available with the vast majority of information being accessible through the use of information technology. There was only one textbook located at the time of the document audit (published year 1989). No hard copies of journal articles were located. Predominantly print-based materials were memos, circulars, newsletters, policies and procedures and competency-based assessment tools.

Table 4.1 Electronic and print-based sources of information available at case site 1 (number specific to enteral feeding practice)

Print-based	Electronic
Intensive care unit policy* (2)	Intensive care unit policy* (2)
Hospital policy* (2)	Hospital policy* (2)
Learning materials* (3)	Learning materials* (3)
Textbook	Textbook
Poster (1)	Peer-reviewed journals
Algorithm (1)	Intranet
Commercial information (1)	Internet
Media release	
Newsletter	
Memo	

*indicates same document available in both print-based and electronic formats

Of the information available to nurses in the intensive care unit, there were few that explicitly appeared to be based on research. For example, intensive care unit documents for policies, procedures or clinical practice guidelines contained reference lists that were a mix of research and review articles. In examining the documents it was difficult to ascertain the quality of the evidence on which the document was based.

4.3 Study participants

All registered nurses working in this intensive care unit had the opportunity to be involved in this study. Registered nurses with specific responsibility for the provision of patient care were invited to participate in Stages 1 (Think Aloud) and 2 (Q sort) of data collection. Those nurses with specific responsibility for staff development were invited to participate in Stage 3 (Focus Groups) and are identified in the text as senior nurse clinicians. Details of participants for each data collection stage are detailed below. Data obtained from participants and reported in this thesis has been de-identified and pseudonyms used.

4.3.1 Stage one – Think aloud participants

Six registered nurses participated in this stage of the study and demographic data are contained in Table 4.2. Five of the participants were employed as registered nurses and one was employed as a clinical nurse specialist. Only two participants had previous experience in research, primarily in a data collection role, although one participant had previously been an investigator on a research project.

Table 4.2 Case site 1: Demographics for thinking aloud participants

Characteristics	Categories	Number
Age	21-25	2
	26-30	1
	41-44	1
	45+	2
Gender	Male	3
	Female	3
Number of years as a RN	1-2	1
	3-5	2
	6-10	2
	11-15	1
Years experience in critical care – Mean (range)		3.2 (1-7)
Initial nursing qualification	General (hospital) certificate	1
	Diploma of Nursing	1
	Bachelor of Nursing	4
Highest qualification in nursing#	General (hospital certificate)	1
	Bachelor of Nursing	2
	Graduate Certificate	3
Specialty qualifications*	Intensive Care (Adult)	2
	Cardiac/Cardiothoracic	2
	Critical Care	2

One participant had a hospital based post-registration specialty qualification at the Certificate level

* Two participants had more than one specialty qualification; two participants did not hold a specialty qualification

4.3.2 Stage two – Q sort participants

An invitation to participate in stage two (Q sort) of the project was extended to all (n=77) registered nurses employed in the intensive care unit. Of the 77 registered nurses invited to participate, four were on annual leave at the time the Q sort was distributed. The Q sort was distributed once and ad hoc follow-up was conducted by the Clinical Nurse Consultant. Participants who had not completed the Q sort were asked to either submit the documentation or to return incomplete forms. Where possible, offers to relieve staff from direct patient care were made, although this offer was not taken up. In total 18 completed Q sorts were returned, although one participant only fully completed the Q sort for accessibility of information resulting in

17 Q sorts completed for the construct of usefulness and 18 Q sorts were completed for accessibility of information. This reflected a response rate of 21% at this site.

The majority of participants were female and employed as registered nurses; five were employed as Clinical Nurse Specialists. The mean length of experience in critical care was 5 years (range 1.5-14). More than half had completed a Bachelor of Nursing as their initial nursing qualification. Twelve participants had a post-registration qualification with the majority of these at a Graduate Certificate level; only one nurse held a Masters Degree. Demographic characteristics of the participants are detailed in Table 4.3.

Table 4.3 Demographics of Q sort participants at Site 1 (n=18)

Characteristics	Categories	Number
Age	21-25	1
	26-30	7
	31-35	6
	36-40	1
	41-45	2
Gender	Male	4
	Female	13
Number of years as a RN	3-5	4
	6-10	11
	11-15	2
Initial nursing qualification	Diploma of Nursing	6
	Bachelor of Nursing	11
Highest qualification in nursing	Diploma	3
	Bachelor of Nursing	6
	Graduate Certificate	8
	Masters	1
Specialty qualifications*	Intensive Care (Adult)	7
	Cardiac/Cardiothoracic	1
	Critical Care	3

* One participant had postgraduate qualifications in renal nursing. Four participants held two critical care qualifications, both at the Graduate Certificate level.

4.3.3 Stage three – Focus group participants

Registered nurses working in leadership positions in the intensive care unit at Site 1 were invited to participate in the focus group. All who were invited to participate chose to do so. The focus group consisted of the Nursing Unit Manager, the Clinical Nurse Consultant, and four Clinical Nurse Educators. Two focus group participants were male and four were female. The mean age was 28 years (range 26-37) and participants had an average of 10 (range 6-15) years critical care experience. All participants held either a Graduate Certificate or Graduate Diploma in Intensive Care Nursing. Four participants also held a Masters degree.

4.4 Case site 1 findings

Data collected for each stage of the study were analysed and revealed four key findings. The first finding specifically related to clinical decisions made by nurses. The second finding related to information used to support clinical decisions including the usefulness and accessibility of information and preferred sources of information to support clinical decisions. The use of research as information to support clinical practice was also included. The third finding focused on the veracity of information used in clinical decision making, specifically the authority, independent corroboration, plausibly and presentation of information. The final finding described the nature of inquiry at case site 1. Each of these findings is described in detail below.

4.4.1 Making decisions

Decision making was explored in the context of enteral feeding practice during Stage One of the project with concurrent and retrospective verbal protocols used as data collection methods. The focus group interview with senior clinical nurses provided additional insight into issues that impacted on decision making in clinical practice such as the perceived responsibility for decisions and accountability for decisions made.

Management of enteral feeding in the critically ill requires input from various members of the health care team although it was difficult to clearly identify independent decisions being made by nurses. Important feeding-related decisions,

such as starting feeds, rates and changing feeding strategy, were attributed primarily to doctors and there was little evidence to show that nurses were proactive in promoting feeding in their patients. For example, one patient who was clearly tolerating feeds did not have the rate of feed increased for several days even though the participant believed that this was both appropriate and possible. Instead this was viewed as a medical decision and one that did not warrant nursing input.

Well, we get the decision made for us generally. When to start and stop our feeding. It is usually the surgeon's call; or the Intensivist's. The timing, changing regimens is not a nursing issue. It [increasing the rate of feeding] could have been done sooner. I'm not sure why they decided to leave it three or four days. David, RN

While the notion of collaborative decision making in the area of enteral feeding was alluded to, it seemed apparent that all decisions ultimately rested with the medical team. All patients in the intensive care unit were reviewed by a dietician and a nutritional support strategy was documented in the patient's notes however this largely went unnoticed by both nurses and doctors.

I didn't realise that the dietician had ordered that [Nutrison Protein Plus at 90 mls/hr]. Anyway, the team came through this morning and they were quite specific....they said we could swap to concentrate. Hannah, RN

Discrepancies between nutritional support strategies suggested by the dietician and those of the medical team were not uncommon suggesting that enteral feeding related decisions were not always made collaboratively. When the discrepancies did occur Robert suggested that you would always "Go with the doctor".

The need for nurses to confirm a clinical decision with a colleague was apparent and reliance on input from medical colleagues occurred even when nurses seemed certain about enteral feeding management issues. In the case of a patient who was to be extubated, John articulated the need to cease the feeds in order to minimise aspiration risk yet still felt the need to check with the doctor to be sure this course of action was correct. The need for reassurance in decision making, as Eden describes, may be related to apprehension about making a wrong decision.

...we are really scared of taking that [decision making] on so on the one hand we complain that we don't have enough responsibilities in decision making but on the other we actually, at every opportunity, we knock it back. Eden, senior nurse clinician

Feeling comfortable making independent decisions may be difficult for many nurses, particularly when many suggestions are made that independent decision making should be treated cautiously. Even for experienced registered nurses the freedom to make an independent decision must be earned and the individual's ability to do so heavily scrutinised.

...when we have new staff coming on the floor...even someone with experience...if you don't ask questions we are going to be concerned with you and please run by your problem solving and thinking [about your] decision ...run it by someone like the team leader or a senior before you carry it out... Sharon, senior nurse clinician

It was also suggested that the specialisation of nursing impacted on decisions nurses were willing to make independently. While areas of fundamental nursing practice, such as the management of pressure areas and bowel care, were identified as being areas where nurses feel comfortable making decisions, concern was also expressed that specialisation by nurses contributes to a reliance on the expertise of others and avoidance of independent decision making.

*..I'm really grateful that we've got all new things around, and the expertise, but the temptation is for the clinician **not** to make a decision, **not** to make an assessment but just to pick up the phone and ring [the expert nurse] and I'm horrified when I see her [the expert nurse] in the room because I think it is [fundamental nursing care]. I'm sure if you really took two minutes you would have known what to [do].* Eden, senior nurse clinician

Conformity to established practice or guidelines was evident. However consideration of the physiology underpinning established practice or guidelines was not well articulated and how practice applied to individual patient care was not routinely expressed. Abigail described aspirating gastric residual volume every four

hours because “it was the standard protocol”. Similarly a reluctance to practice outside the norm of the unit was evident when Robert suggested that “...it is just learned environmentally. They aren’t things that you are taught...you watch what they do...you just get that generic, sort of, that is how it is done.” However, for Abigail, consideration of the patient’s clinical presentation and personal experience meant a deviation from the protocol.

As you become more experienced you can make a decision, and I think what I do, is as part of my assessment....I only work 8 hours a day, and I think, well, I’ve aspirated it and unless there is something to worry about I often don’t reassess [the aspirate] again if I am not concerned about it.

Abigail was also concerned about the potential consequences of independent judgment and reflected on an episode of pulmonary aspiration in an enterally-fed patient who had not had the GRV assessed. The incident influenced this participant’s decision making and clinical practice.

I often think about that. I am aware of that, thinking that actually prompts me to [look at my NG]. That actually does play on my mind. I don’t know if it is true or not...It plays on my subconscious. And I think that is why I do it as part of my assessment. Abigail, RN

Proactive decisions by participants at case site 1 were rarely made in relation to the management of enteral feeding, even for those decisions that were more routine and not associated with a high degree of uncertainty. When clinical uncertainty was present there was also a reliance on others, particularly doctors to guide the decision making process. The demonstrated reluctance to make independent decisions may have been further reinforced by more senior nurses who indicated that decision making by bedside nurses needed to be monitored or assessed and by the notion that all enteral feeding decisions needed to follow an established guideline. Although only described by one participant, the presence of specialist nurses was also thought to contribute to nurses deferring decision making to others, even for the most fundamental nursing care. Consequently, it appears that there are individual and organisational factors that directly impact on independent decision making by nurses working in an intensive care environment.

4.4.2 Information used to support clinical decisions

Within the clinical environment, registered nurses have many different sources of information available to help inform decision making. The types of information identified at case site 1 included people, print- and electronic-based media. During the think aloud process and retrospective probing, people were the information sources most commonly identified and little reference was made to print-based and electronic sources of information, although both were accessible to clinicians. Details of electronic and print-based information sources available have been described in section 4.2.7. The usefulness and accessibility of information sources available at case site 1 was explored through the Q sort process and revealed perspectives for two distinct groups of individuals. Finally, the focus group process allowed for the opinions of senior nurse clinicians to be explored as it related information sources considered most accessible and useful by registered nurses working in the intensive care unit.

4.4.2.1 Usefulness of information

Perspectives on the usefulness of information were considered in the context of a clinical scenario based on enteral feeding of a critically ill patient (p.55). In completing the Q sort participants considered and sorted information sources from the most useful to the least useful. Data were initially analysed using descriptive statistics to determine how individual sources of information were ranked in terms of usefulness. Information sources ranked from +6 to +2 were considered useful, those ranked from +1 to -1 were considered uncertain, and those ranked from -2 to -6 were considered not useful. Information sources with a frequency of 50% or greater were categorised as useful and those with a frequency of less than 50% were categorised as not useful (Table 4.4). Data suggested again that people were considered the most useful sources of information to assist with resolving uncertainty. However not all people were viewed equally and those with more clinical experience rated more highly. Only two people were not considered useful; the Intern and Professor of Critical Care Nursing. The majority of the participants felt that the Intern would not be a useful source of information. Such a clear distinction was not evident in relation to

the Professor of Critical Care Nursing, where near equal numbers considered the position useful (45%) or not useful (47%).

Table 4.4 Usefulness of information sources for case site 1

	Useful	Not useful	Uncertain
>50%	<p>Clinical Nurse Educator Team Leader Clinical Nurse Specialist Clinical Nurse Consultant RN (more experience) Intensivist Dietician Senior Registrar Personal Experience Clinical Practice Guideline Clinical Practice Guideline</p>	<p>Department of Health media release Pre-registration course notes Infection Control Policy Manual MIMS Newsletter Hospital circular Department of Health memo University notes Professional organisation website</p>	<p>RN (less experience) Resident Medical Officer Registrar Research Nurse Nursing Unit Manager Poster – corporate Conference information Poster – clinician Textbook# Policy Manual Unit meeting minutes Product information Department minutes Abbreviated Policy Case Study# Original Research# Internet Intranet Systematic Review# Textbook # ICU homepage ICU policy and procedure Literature Review#</p>
<50%	<p>ICU policy and procedure Patient notes* Hospital policy and procedure</p>	<p>Intern Professor of Critical Care Nursing Critical Care Competency document*</p>	<p>Registered Nurse (same experience) Critical Care Competency document Library – hospital Library – university Algorithm Patient notes* Critical Care Competency document*</p>

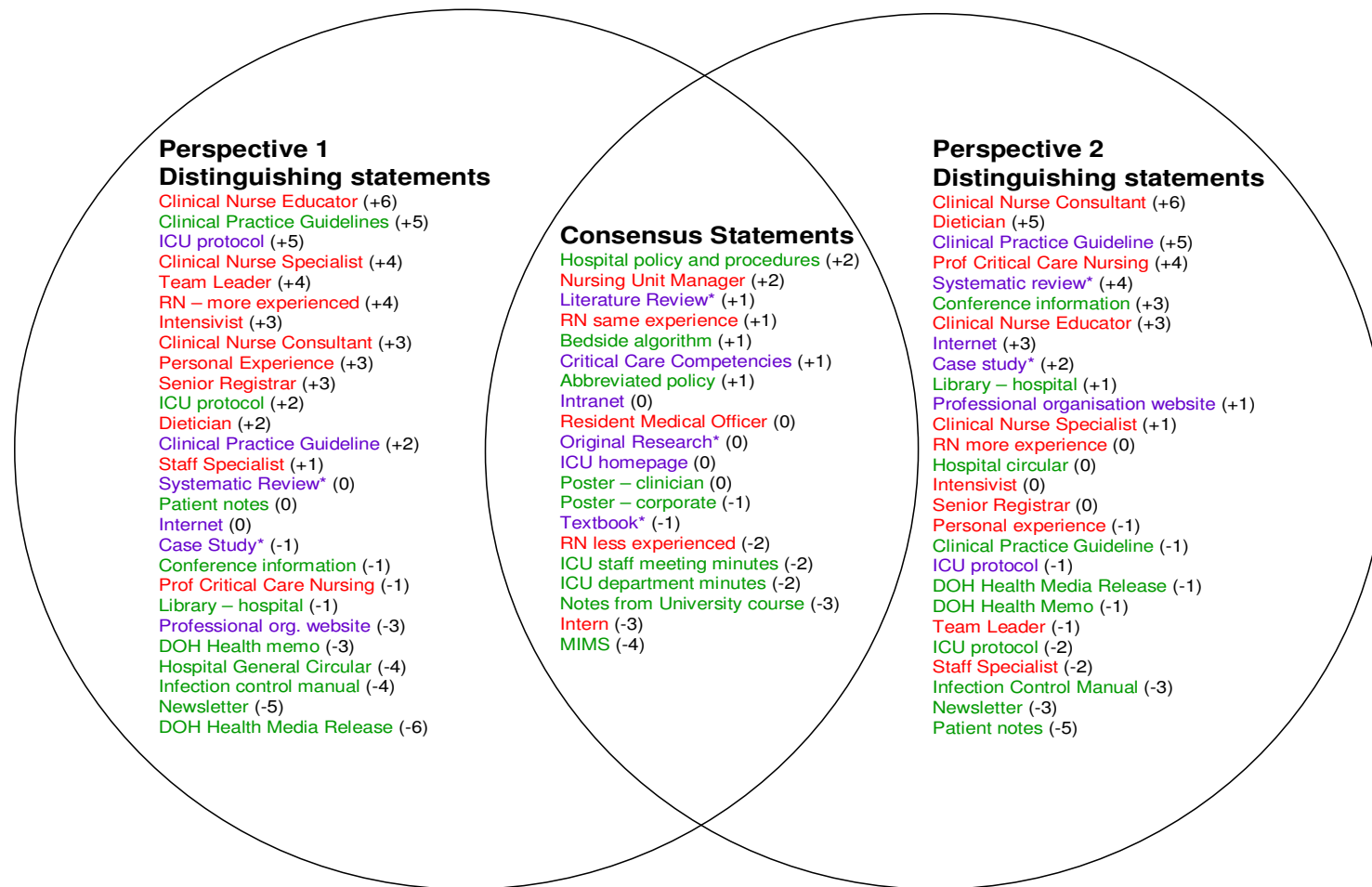
* items with equal scores for >1 category
published, peer-reviewed source
Abbreviations listed on p. xv

Red text = personal communication
Green text = print-based information source
Blue text = electronic information source

Analysis of the Q sort of 56 items (Appendix 4) revealed the perspectives of two distinct groups of individuals that explained 60% of the total variance (Perspective 1- 51%; Perspective 2 - 9%). Of the 56 items sorted, 20 items were considered consensus statements, that is the response to the statements did not help distinguish between the two groups. Few of these 20 items were considered useful with only seven items rating positively but only scoring either +2 or +1 (Figure 4.1). Distinguishing statements highlighted information sources that were ranked differently by each subgroup ($p < 0.01$).

The key differences in information sources considered useful highlighted the perspectives of the two groups. The predominant perspective (Perspective 1) reflected the views of 15 of the 17 participants who completed the Q sort. Twenty-seven sources of information were identified of which 14 were positively ranked and considered useful. Of these 14 positively ranked information sources the majority ($n=10$) were people (Figure 4.1). The alternate perspective (Perspective 2) represented the views of two participants (Q 1-5 and Q 1-46). These participants positively ranked 12 sources of information, however less than half ($n=5$) were people. Qualitatively who these participants ranked most highly was also different; the Clinical Nurse Consultant (+6); Dietician (+5); and Professor of Critical Care Nursing (+4) were considered more useful than those clinical nurses who may spend a higher proportion of time in the clinical area. Analysis of participant characteristics, such as age, specialty qualification, and years of experience or position, for each group did not highlight any unique differences that may help explain either perspective.

Figure 4.1 Q sort rankings for distinguishing and consensus statements for the usefulness of information at case site 1



Print-based information sources were seen as the least useful (Table 4.4). However, of the eight print-based sources of information listed as not useful, only one of these contained specific information on enteral feeding practice. Uncertainty about the usefulness of print-based information was evident for nine items, four of which contained information relevant to enteral feeding. The most useful source of print-based information was the clinical practice guideline (71%) and this was ranked +5 by most participants although those in Perspective 2 considered this document not useful (-1) (Figure 4.1). The intensive care unit enteral feeding protocol was considered useful by only 47% of participants, and was poorly ranked in terms of usefulness by those in Perspective 1 (+2) and Perspective 2 (-2).

Electronic sources of information did not rate as highly as their print counterparts. For example, the print-based clinical practice guideline was considered useful by 71% while the electronic version of the same document was only considered useful by 43% of participants. Similar discrepancies were seen with the intensive care unit policy and procedure manual where 47% of participants considered the hard copy useful while uncertainty about the usefulness of the electronic version of the same document was noted (53%). Q sort data did not help to clarify perspectives of how print-based documents performed against their electronic counterparts. Those in Perspective 2 identified electronic documents as being more useful than print-based documents with the electronic version of the clinical practice guideline higher than the print-based version (+5 vs -1). The views of those in Perspective 1 were equivocal with the print-based clinical practice guideline (+5) ranked higher than the electronic version (+2) and the electronic version of the enteral feeding protocol (+5) was ranked more highly than its print counterpart (+2).

The usefulness of information sources that provided pre-appraised information, such as hospital- and unit-based documents, rated more highly than original sources of information such as research reports (Figure 4.1). Bryan, a senior nurse clinician, also suggested that using organisational documents provided some protection or assurance in the making of a clinical decision so that

the nurse “wasn’t practicing outside the boundaries of what was expected in that unit” and therefore wasn’t “exposing [themselves] to a [performance management] issue”. The use of research to inform practice was seen by Reid, a senior nurse clinician, as an ineffective use of time, a strategy that wouldn’t provide a definitive answer and ultimately futile because “the policy is always going to override [anything else]”.

The need to focus on safe practice rather than evidence-based practice was extensively discussed by senior nurse clinicians during the Focus Group interviews but was not an issue highlighted by any other participant. The perception that clinicians should not independently make clinical decisions, even those related to fundamental nursing care, meant that imposed risk minimisation strategies were required and that the majority of staff support was directed towards maintaining safe practice rather than developing evidence-based practice skills.

And unfortunately we actually struggle to get those practices at times so whilst the bigger questions are important and we like people to be able to practice more independently and to be critical thinking and to be skilled at reviewing evidence, a lot of the time we are battling to ensure that we have a minimum standard and to ensure safety. Bryan, senior nurse clinician

Although sources of information can be considered useful, if they are difficult to access then their usefulness in helping to resolve uncertainty in clinical practice will be negligible. For many participants the usefulness of the information was impacted considerably by what was considered accessible.

4.4.2.2 Accessibility of information

Accessibility of information was highlighted during the Think Aloud stage of data collection and was further explored when participants completed a Q sort specifically asking the participants to consider accessibility of information while reflecting on an episode of uncertainty in clinical practice. It was suggested that the reflection pertain to enteral feeding practice however if they could not remember an area of uncertainty related to enteral feeding, another area of clinical

practice could be considered. While reflecting on their chosen clinical situation participants were asked to consider accessibility of information sources in the Q sample and to sort these from most accessible to least accessible. Data were initially analysed using descriptive statistics to determine the overall view of accessibility of information sources. Information sources ranked from +6 to +2 were considered accessible, those ranked from +1 to -1 were considered uncertain, and those ranked from -2 to -6 were considered not accessible. Information sources with a frequency of 50% or greater were grouped into one category as were those that had a frequency of less than 50% (Table 4.5).

The accessibility of people as sources of information was predominant with the exception of the Intern who was considered not accessible by 65% of participants and the Professor of Critical Care Nursing who was considered not accessible by 47% of participants. The Q sort also highlighted the accessibility of people as sources of information. Only one perspective on the accessibility of information was identified and accounted for 61% of the explained variance. People were seen as the most accessible sources of information. Of the 23 information sources considered useful, 13 of these were people (Table 4.6). Those who were considered highly accessible included clinicians, nurses in particular, whose primary work responsibility involved direct patient care. Accessibility appeared to be clearly linked to responsibility for direct patient care and proximity with the top five sources of information being clinicians always present in the clinical area.

Table 4.5 Accessibility of information sources for case site 1

	Accessible	Not accessible	Uncertain
>50%	<p>Clinical Nurse Educator Team Leader Clinical Nurse Specialist Clinical Nurse Consultant RN (more experience) Intensivist Dietician Senior Registrar Personal Experience Clinical Practice Guideline Clinical Practice Guideline</p>	<p>Intern Dept of Health media release Infection Control Policy Manual MIMS Pre-registration course notes Hospital circular Newsletter Dept of Health memo Professional organisation website</p>	<p>Inservice Resident Medical Officer RN (less experience) Registrar Research Nurse Nursing Unit Manager RN (same experience) Poster – corporate Poster – clinician Conference information Policy Manual Textbook# Product information Unit meeting minutes ICU Department minutes University notes Case Study# Original Research# Internet Intranet Systematic Review# Textbook # ICU homepage ICU policy and procedure* Literature Review#</p>
<50%	<p>Patient notes* Hospital policy and procedure* ICU policy and procedure* Critical Care Competency document</p>	<p>Professor of Critical Care Nursing Patient notes*</p>	<p>Abbreviated Policy Critical Care Competency document Library – hospital Library – university Algorithm ICU policy and procedure Hospital policy and procedure* Critical Care Competency document*</p>

DOH = Department of Health
* equal scores for >1 category
published, peer-reviewed source

Red text = personal communication
Green text = print-based information source
Blue text = electronic information source

Abbreviations listed on p. xv

Table 4.6 Factor Q-Sort Values and Z score for accessible information sources

	Factor Array	Z score
Personal experience	6	2.420
RN (more experience)	5	1.848
Clinical nurse specialist	5	1.789
RN (same experience)	4	1.605
Team leader	4	1.585
Patient notes	4	1.451
Clinical Nurse Educator	3	0.982
Intensive care unit protocol	3	0.949
Nursing unit manager	3	0.883
Intranet	3	0.859
Intensive care unit homepage	2	0.853
Registrar	2	0.781
Clinical practice guideline	2	0.756
RN (less experience)	2	0.736
Resident medical officer	2	0.723
Senior Registrar	1	0.707
Hospital clinical policies, practices and guidelines	1	0.626
Bedside algorithm	1	0.595
Abbreviated policy at bedside	1	0.583
Intensivist	1	0.569
Critical Care Competencies	1	0.443
Clinical nurse consultant	1	0.379
MIMS	1	0.367
Intensive care unit protocol	0	0.308
Staff Specialist	0	0.130
Infection Control Policies and Procedures	0	0.088
Internet	0	0.039
Dietician	0	-0.033
Clinical practice guideline	0	-0.146
Critical Care Competencies	0	-0.177
In-service information	0	-0.188
Systematic review*	0	-0.196
Literature review*	0	-0.261
Product information	-1	-0.278
Case study*	-1	-0.376
Textbook*	-1	-0.378
Original research*	-1	-0.398
General intensive care unit staff meeting minutes	-1	-0.455
Hospital policy manual	-1	-0.493
Research Nurse	-1	-0.510
Poster - clinician	-1	-0.671
Intensive care unit department meeting minutes	-2	-0.706

Library services hospital	-2	-0.762
Textbook	-2	-0.896
Poster - corporate	-2	-0.917
Intern	-2	-1.035
Professor of Critical Care Nursing	-3	-1.133
Conference information	-3	-1.150
Library services university	-3	-1.252
Hospital General Circular	-3	-1.265
Notes from university course	-4	-1.275
Professional organisation website	-4	-1.304
DOH Health memo	-4	-1.420
Newsletter	-5	-1.586
DOH Health Media Release	-5	-1.750
Pre-registration course notes	-6	-2.029

Red text = personal communication

Green text = printed information

Blue text = electronic information

*peer-reviewed, published information

Abbreviations listed on p. xv

The preference for using other people as sources of information may be linked to their immediate availability and the speed at which information can be obtained particularly when there was a perceived lack of time available for locating information in the literature or even in institutional-based documents.

But if I can find that result from someone more simply because it is sort of effective time management, staff is [sic] the best option in my mind for that... David, RN

I think it is a challenge. It is a timing challenge. When you are working clinically, it [asking other people] is what you do. You need answers to do what you've got to do at the time. John, RN

For David, the idea of accessing information was described in terms of increasing societal impatience and demand for instantaneous resolution of the dilemma; getting information quickly was more important than getting accurate information.

Well, it [asking another person] is faster, more accurate. In the fast food society that we are, we like things quickly and if it goes well then that is the better option than spending longer getting the same result, which maybe more precise, more thorough.

Print-based sources of information did not rate highly in terms of accessibility. Patient notes were ranked most highly (+4), followed by clinical practice guidelines (+2). The hospital policy, bedside algorithm, abbreviated policy and MIMS were all ranked +1. The majority of print-based information (19 items) was considered not accessible (Table 4.6). Again, time seemed to feature in terms of the accessibility of print-based information despite an appreciation of the quality some sources of information.

Theoretically, I like the idea of having policies because in my past life I like engineering policies and I still try to develop good policies so I appreciate why using them....and how useful they can be if they are developed carefully. But I don't have a lot of time to go running through policies and generally if a question comes up there isn't time at that point to go and dig it out and read through it and decide if it relates to the patient and that sort of thing. It is daunting to have a stack of them to go through. You don't know where to start. Patricia, RN

Four electronic sources of information were considered accessible, although only the clinical practice guideline was considered accessible by the majority of participants (53%) (Table 4.6). Rankings of accessibility reflected the general perspective that most electronic information was not accessible. Only the intensive care unit protocol (+3), intranet (+3), intensive care unit homepage (+3) and critical care competencies (+1) were rated positively (Table 4.6).

The ease of accessing information may be an important factor impacting on the overall accessibility of electronic information. For one participant, the ease of getting to the data outweighed the accuracy and completeness of what data might be obtained. Despite being able to articulate the different sources of information available electronically and the authority associated with peer-reviewed and

institutional-based information, there remained a preference to look for information on the internet, knowing that the quality of information was widely variable.

I'm a bit naughty and I would just probably put it into a search engine and see what websites come up. John, RN

Being able to easily locate the information also appeared to be a barrier for some, with John describing the process of locating literature as “hunting for it” and Abigail indicating that she wouldn’t look up research because that information was “hard to access” and that she wasn’t “very good at doing a search so it would be too hard and too time-consuming”. These challenges in accessing electronic information had an impact on locating published, peer-reviewed literature that is predominantly accessible electronically at case site 1. Even when individuals were skilled in accessing electronic information, barriers to access were still present and sufficient enough to cause frustration and therefore abandon the search for information.

Yeah, I do [use the internet] but there are lots of passwords and things a lot of the time. For me that is a barrier [to using the internet] and when that happens I just give up. Robert, RN

For Hannah the inability to access information because of password access wasn’t a barrier in itself but rather at an institutional level that access to electronic information was not made possible.

...mainly because I have had one bad experience and I was asked to use a password and I actually rang the library and said can I get a password for it but for some reason I wasn’t able to access it. And since then, I’m the type of person who thinks, well if I can’t get into that area then, you’ve made it difficult for me so I’m going to give up.

4.4.2.3 Preferred sources of information

When faced with uncertainty in clinical practice the participants most frequently sought information from other people who were overall considered the most useful and most accessible sources of information available in the clinical area. Participants discriminated between people and more frequently identified those whose position was associated with a higher level of experience and clinical relevance (such as a Clinical Nurse Consultant or Clinical Nurse Educators) or if the person had specific expertise related to enteral feeding. When questioned about sources of information used to support clinical decisions all those who participated in the think aloud stage of data collection indicated that asking another person was their preferred strategy for accessing information and was clearly summarised by David who said, “Generally I’d ask, I’d always go to the person next to me first”. This suggests that proximity was an important factor in selecting who to ask but for many, including Robert, the experience, as well as proximity, of the person was an important consideration.

Well, I suppose for me the first step would be to ask who ever is next to me, if they are more experienced.

The preference for using people as a source of information was such that if clinical uncertainty was not resolved in the first instance, many participants would seek additional information, but from a different person. Importantly, in these types of situations it was common to seek the advice of someone with a higher level of perceived expertise.

[if that didn’t help resolve the uncertainty]...the next step would be someone else, higher up the chain. David, RN

*And if my colleagues weren’t able to help me I might go further up the chain, like as a doctor or my NUM 3 [Nursing Unit Manager Level 3]...
Abigail, RN*

However, obtaining information from people only could also be problematic. Some participants were particular about the characteristics a person should exhibit

before they would approach them for information in the clinical setting; a strategy that was not always possible with changes in staffing mix or when fewer staff are available. As John commented ‘it [the episode of clinical uncertainty] was on nights so it was a little more difficult [to access the information needed].

In the clinical environment different sources of information were available, including print- and electronic-based information however these were infrequently identified as sources of information used to support clinical decision making. The perceived usefulness and accessibility of these information sources were naturally important considerations.

4.4.2.4 Research as information to inform clinical practice

Published, peer-reviewed information generally rated poorly although the two participants forming Perspective 2 for the Useful Q Sort rated systematic reviews highly (+4) and also considered published case studies useful (+2). Traditional literature reviews were considered useful by both groups but was not highly rated +1. The usefulness of such information may be related to individual skill and ability to comprehend and critique information, particularly research-based information.

Comprehending the research can be tricky, validating it, is it worth adapting? Is it a valid study? That kind of stuff. Is it valid, is it applicable to the patient. Those kind of issues would prevent you using it. It is not my strongest area. Research has its own language...I don't know what it means. I only know the basics, just enough to go well if it is this, this and this then it should be OK but I can critique but I don't have a lot of experience critiquing. David, RN

Interestingly, nurses who indicated a level of confidence in reading research did not clearly articulate the process of evaluating research and often used language inconsistent with appraising the literature.

Research, it has its own language. You know, quantitative, qualitative, those two, stats and quasi, I don't know what it means. I only know the

basics, just enough to go well if it is this, this and this then it should be OK but I can critique. David, RN

I think that I read it critically. I look for peer reviewed articles and read this in terms of the article, hypothesis, conclusion, you know... John, RN

...very comfortable with it [evaluating research]. Well, I would suppose I would endeavour to see if there were more articles that came up with the same findings. Robert, RN

The volume of available information was also daunting and this, coupled with expertise needed to both locate and critique the literature, made using literature as a source of information prohibitive from a perspective of both ease and time. Patricia suggested the use of literature by proxy where someone “trusted” could review the literature and locate the best and most relevant papers thereby “saving you hours and hours of searching to just find crap that you throw away.” The notion that individual nurses should directly base their clinical practice on the best available evidence was not supported by senior nurse clinicians who also saw the body of literature available to guide nursing practice as being variable and therefore not useful for clinical decision making.

...every clinician knows ...that if [you look at the] literature you'll get 10 different stories. That is why guidelines are so popular. Eden, senior nurse clinician

The expanse of literature and variability in recommendations from individual papers is perhaps difficult to navigate for one individual. A team approach to appraising the literature and formulating recommendations was suggested but it was unclear where the responsibility for this activity rested. For Reid, a senior nurse clinician it did not appear that clinical nurses had a role to play in evaluating research-based literature.

...you can get a panel of the best experts, with the best literature available from RCTs and [decide what the recommendation should be]. It's

inappropriate for people at the bedside to be having to make those decisions.

Information used to support clinical decisions was available through social interaction, as well as in print and/or electronic forms. Overwhelmingly, using other people as a source of information was preferred by most participants and was associated with the perception of increased accessibility. The usefulness of other people as sources of information may be associated with their ability to provide what was accepted to be credible information. Print and electronic sources of information, although available in the intensive care unit, were not considered as accessible, possibly because acquiring information through this media was considered to be more time consuming. Original research as an information source was infrequently used as an information source and was associated with difficulties in access, at both a practical and intellectual level.

4.4.3 Veracity of information

Veracity is an important aspect of selecting information to inform clinical decisions. Participants referred to concepts relating to the veracity of information and Fallis' (2004) perspective on verifying the accuracy of information as a framework for data analysis. As described previously (p. 23), characteristics of authority, corroboration, plausibility and presentation can be used to collectively evaluate the veracity of an information source and accordingly these characteristics have been applied to the data in this study and used as a framework for analysis.

4.4.3.1 Authority

Participants discussed issues of authority predominantly within the context of individuals, although some reference to authority of text-based sources was also identified. When individuals were the source of information an individual's level of experience was one of the key criteria nurses used in determining who to approach. This was described by Hannah who reflected on an episode of clinical uncertainty where a more senior nurse was asked for information, "If I am unsure, I'll ask a senior staff member and I'll try to go by them...It was an experienced

staff member. I trusted her, her opinion”. Seeking information from more experienced nurses was seen as a way of accessing reliable information and illustrated a direct link between level of experience and perceived knowledge levels.

I would ask someone who, um, at my level or a similar level. If I didn't know the question then I would be asking someone who I think may have the solution to my problem. If I didn't know the answer then I wouldn't be asking a new grad because it would be unlikely that they would have that level of [knowledge]. Abigail, RN

Perceived clinical expertise was also viewed as an important consideration with an example given of approaching a colleague from a cardiothoracic ward to provide information on chest drains. David commented, “Because they are more experienced with it [the chest drain] than I would be” and would be therefore more “knowledgeable” and “credible”. In this situation it was the context rather than length of clinical experience that was important and added authority to the information.

The position held by the individual within the organisation played an important part in determining authority of the individual with the doctor having ultimate authority, as Robert indicated, “... if I am really unsure about something I'll go and ask the doctors”. However, positions of authority also were required to meet criteria related to experience as Patricia commented “There might be doctors that are very, very young or [I might] have other reasons to not feel real comfortable with their judgment.”

Similarly, nursing positions were linked to authority, and for Bryan, a senior nurse clinician, those working as a Clinical Nurse Specialist, Clinical Nurse Educator or Clinical Nurse Consultant should feature highly in terms of authoritative information. Aspiring to a higher position also influenced the authority of an individual to the extent that those nurses who applied, but were not appointed to, higher positions were also considered authoritative.

I know they are a [Clinical Nurse Specialist] or whatever, then obviously that is a pretty good indication. I know that someone who has been an educator or has even probably sat for an interview to be an educator then obviously they are up there. Robert, RN

Holding a particular nursing position within the clinical area was an important indicator of the authority of information but was also viewed within the context of experience.

Well, you don't get to where she [the Clinical Nurse Consultant] is by being an idiot. Some might. The way she is, she is very intelligent, vastly more experienced than myself and I guess it is the seniority. David, RN

While experience was an important consideration, the position held by an individual could also be factored into views of authority when information is needed for clinical decision making. For example, rankings of the usefulness (+2) and accessibility (+3) of the Nursing Unit Manager suggest that they may be appropriate to help support clinical decisions. However, being in a management position for some time meant Bryan, a senior nurse clinician felt he was no longer clinically credible and was therefore uncertain about the reliability of information he was able to provide to the extent that complex clinical decisions (which would have comfortably been made in the past) were now deferred to others, such as the Clinical Nurse Educator or Clinical Nurse Specialist. The focus of individual roles naturally meant that some individuals were better placed to address specific issues than others. The focus of the Nursing Unit Manager's role was predominantly administrative and associated with responsibilities for performance management. This prompted Reid, a senior nurse clinician, to contemplate whether asking a Nurse Unit Manager for information might "highlight deficiencies that might then be addressed during performance review" and proposed this as a reason why those in such a role might not be approached for information.

The position of Clinical Nurse Specialist was one that was viewed as being authoritative, particularly by the senior nurse clinicians, and one from which clinical nurses could seek information.

I think that [the] Clinical Nurse Specialist is seen as a role model because quite often they will be in a leadership role, they'll be team leader. You'll see them undertaking skills such as delegation in more complex problem solving. So they've been in that role and so if you have got a Clinical Nurse Specialist working clinically beside you...they are the logical person for you and a clinical expert to assist you with problem solving and answering questions. Sharon, senior nurse clinician

The credibility of those in the Clinical Nurse Specialist role was important and considered by some to be robust.

I think that we expect quite a lot compared to other facilities...generally [they] do a very good job of demonstrating the fact that they are up to date. They take a big interest in guidelines and they do try to contribute. I really believe that and I think that's the point of our managers here, they don't give [the Clinical Nurse Specialist title] lightly. What they expect [is] some sort of contribution in recognition of recommending them for the title. Eden, senior nurse clinician

However, variability in the characteristics of individual's in the Clinical Nurse Specialist role was noted by both clinical nurses and senior nurse clinicians, with the extent and nature of variability being perceived differently depending on the experience of the person considering the authority of a colleague.

I know there are people here that are quite senior that if they put a research article in front of me and said that this is the best thing since sliced bread that I'd go, cool and thank you, but I might disagree....because it doesn't mean that.... clinical expertise doesn't mean you're great at research articles. David, RN

...there is variability between the skills of different Clinical Nurse Specialists and I agree with that and think that the variability...the criteria for Clinical Nurse Specialist is reasonably loose and that is set by the award. Despite that, we do have high expectations and whilst some people

would meet the award requirements for Clinical Nurse Specialist [they] perhaps would not necessarily meet the requirements of clinical experts in everyone's eyes. Bryan, senior nurse clinician

As far as authoritative information goes... [there are] variable levels of experience and knowledge [in individuals]. I would think the ability to seek authority about information being given by the Clinical Nurse Specialist will depend on the experience and the person who is seeking the information. So someone who is relatively inexperienced would perceive the authority of the Clinical Nurse Specialist always to be [good] as opposed to someone with more experience who would potentially perceive the [variability] between different Clinical Nurse Specialists. Reid, senior nurse clinician

Knowledge was an important consideration and linked to authority and Sharon, a senior nurse clinician described a “perception that anyone who has completed a post graduate certificate, whether they are Clinical Nurse Specialist or not, [has authority]”. However, for Abigail the ability to represent her knowledge was not seen as critical to being a “competent” or “good” nurse and was not linked to nursing leadership positions, particularly at the Clinical Nurse Specialist level.

There would be some people, not very many, who may have the Clinical Nurse Specialist qualification and they meet the criteria for Clinical Nurse Specialist, and they are probably good nurses and competent but their level of knowledge....they may not always be able to answer my query.

The type of position held by nurses also influenced what nurses considered in terms of authoritative information. For example, nurses working in a research-only role were not seen as authoritative sources of information even though they had extensive clinical experience in intensive care. Because their role was research-only they were viewed as not being clinically relevant and therefore could not contribute meaningful information to clinical questions.

I don't ask them [research nurses] for information about other areas of my nursing that I don't see them in. I'm sure they were both Clinical Nurse Specialists, educators or whatever before they went into research so I'm sure they would know. I know that [research nurse] was a nurse at one stage but, um, I just don't see them as a clinical resource. I see them as someone who is doing research in that job. Not [someone] that I would access. Robert, RN

In summary, the characteristics that contribute to determining the authority of individuals in relation to information use include experience, perceived clinical expertise, position, credibility, and knowledge.

The authority of text-based material was infrequently highlighted although David indicated that “[his] ultimate is obviously the hard written fact”. However, discrimination of written material was infrequently described and often related to unreliable criteria. For instance, David suggested that journal articles written as a traditional literature review were more “believable” especially “if it is in a reputable journal”. It was felt that these papers were more authoritative because the authors couldn’t “get an article in a reputable journal if they weren’t clever”. Other subjective criteria were described and incorrectly attributed to concepts associated with rigour. For example, the need to assess validity of text-based materials was described by John as assessing “the author and location of where it was published, [the] journal, [and] where the research was done”. Eden, a senior nurse clinician expressed concern about accessing web-based information and this was discouraged by senior nurse clinicians because “those resources aren’t policed, we don’t know the credibility of them”.

Using institution-based textual material was highlighted as a source of information that might be explored if clinical uncertainty persisted or if there was conflict in the information obtained. However, only Hannah was able to describe the development process used to produce such documents. The type of information used to inform the documents was also not clear and when asked whether institution-based textual material was research based Abigail answered,

“I’m not sure. I don’t know about that. I don’t think it is, but I could be wrong”. It seemed, though, that what information the policy was based on wasn’t a primary concern because Robert felt that “if it is a policy then obviously it has been researched and it is valid. Someone has OK’d it to make it a policy”. This statement is at odds with another statement by Robert suggesting that “they [the policies] get outdated fairly quickly...there are obviously some that are outdated”.

4.4.3.2 Independent Corroboration

Corroboration was highlighted by most nurses in this study as being an important consideration when evaluating information but did not feature as strongly as data related to the concept of authority and only featured in the data obtained in the Think Aloud stage of data collection. David, in describing understanding of a particular physiological principle suggested that information obtained was strengthened by multiple confirming sources.

I have had in-services on it, tutorials on it and part of the courses I have done and also what people have told me. This is why you do it. So I got it from other sources, not just the reading.

In this description, David conveyed a need to have others confirm information obtained from text-based material, perhaps suggesting a reluctance to rely on his own interpretation of the material while Robert suggested that corroboration of information was important so “[he] would endeavour to see if there were more articles that came up with the same findings” while Patricia was more circumspect about information obtained through the literature and highlighted the importance of corroboration to obtain broad agreement about information.

I am also aware that you maybe have to compare a few different, well chosen papers to get a pretty well rounded and reliable perspective.

The need for corroboration was most prevalent when information provided did not make sense or was contrary to information previously provided. When information was provided that conflicted with the nurses’ own knowledge base it

was most likely that they would approach another person, usually in a hierarchical manner, to obtain a second opinion. If this did not resolve their clinical uncertainty then consideration would be given to institutional-based information, such as policies and procedures.

I would ask a third person, to tell you the truth. If there was someone else, someone else that knew, ask another unit that might be working on it. I might go and ask them, get their opinion. That's what I'd do next. And then the computer. Hannah, RN

The lack of corroboration of information was concerning for Patricia who described multiple policies/procedures within one institution that presented conflicting information. The lack of consistent information resulted in questioning the authority of the original sources.

Well, I have had some cause for concern. It would have been a couple of weeks now, and there are quite different policies on some things, and generally they have good rationales for their policy but there are different rationales for different practices. And to some extent that is justified by the different conditions of the work, the patient types, etc. But the fact that there are different policies in different areas, [you] kind of question about how carefully they are developed. Patricia, RN

4.4.3.3 Plausibility

Plausibility of information was highlighted by senior nurse clinicians during the focus groups as being an important aspect of giving information in an effort not just to provide information but to develop an understanding of practice.

...if the information is presented as 'this is what you do and just do it' then that may not be perceived as something [that has good authority] as opposed to giving the rationale as to where that information came from and why you're doing it. So it is not just doing evidence-based practice but whether a rationale is given as to [the] why [for] the evidence-based practice. Reid, senior nurse clinician

Plausibility of information was less frequently highlighted in the Think Aloud data and was not described in any systematic way. However, Hannah described the importance of providing a rationale for information provided by her to others, particularly in how it may assist with learning and understanding.

I'm at the stage now where I've got a lot of junior staff that would ask me questions and I always like to elaborate on why you do certain things and then the rationale that is given to them, well, hopefully it will help them to learn and they will keep in their mind that it isn't just a routine thing that they should do. There is a rationale behind why they do that.

Hannah also recalled accepting information in an unquestioning manner, suggesting that this approach was not the best.

"I admit that I have been guilty of just having gone with what that person has said, mainly because of their level of experience. I didn't question her how she got that information or anything, but I took her word or it".

This comment is interesting in that Hannah was happy to accept information from others without questioning, but when providing information to others felt a responsibility to ensure that information provided was plausible and stated that "I like to be realistic when people ask me questions. I don't ever like to guess at an answer". However, for others, information based on theory or underpinned by physiological concepts was either not sought or not considered necessary. Instead John described relying on less objective measures such as "[his] own gut feeling" as a way of evaluating the plausibility of information.

I think that sometimes things are based on a gut feeling and a few years of doing it and not getting into trouble.

With respect to research-based information, both scepticism and a lack of capacity impacted on the ability to determine the plausibility of information. As identified previously, many nurses felt they lacked the knowledge or skills to appraise literature thus making systematic determination of the plausibility of such information difficult if not impossible. While John felt he was able to

critically appraise the literature, he also expressed scepticism about the information provided by research.

I suppose, though, that I am cynical. I think sometimes there is too much weight put on the scientific method. It is almost like it has iconic status and is seen as the only answer. Really, it holds too much weight for too little. It isn't fool proof.

4.4.3.4 Presentation

Within the context of obtaining information from others the issue of presentation was an important factor, not in determining the accuracy of information, but rather was more related to issues of trust and personal safety related to the use of personal communication as information.

The issue of trust was a predominant feature in terms of who the participants would approach for information, and existed on two levels. First there was trust that the individual was safe to approach, that personal safety wouldn't be affected by seeking information from a particular individual.

Obviously you are going, if there is a choice of people to ask, you are going to ask the person who is less [threatening]. I'm not going to, you are going to be less willing to ask someone who is going to belittle you or make fun of you or think you are a bad nurse because you don't know something. David, RN

She is a very friendly person; a very thorough nurse, I believe. And she has a lot of years experience from a critical care point of view as well. Hannah, RN

General approachability was important with participants being unwilling to make an inquiry to someone who might not respond in a positive manner. For Hannah the fact that a person was “a very friendly person, a very thorough nurse” meant that they were more likely to be approached to help with resolution of clinical uncertainty. Previous experience with an individual was also important for

them to be considered a useful source of information. Knowing that the person had personal experience, specifically in critical care, were important factors to consider.

It would have to be someone that I have worked with in the past, that I know has been in the unit for quite awhile and that I know has had more experience than me. Or if it is something that I know is their field of expertise. Hannah, RN

I think where the person is seeking out the knowledge their experience with the person that they are seeking out as well, so I would rate that as [a] positive experience and through the information that we have received [previously] we would seek [that person] out again. Reid, senior nurse clinician

This type of insider knowledge does present an issue for nurses who are new to a clinical area and the problem is enhanced if there is a large staff profile as it may take considerable time to fully consider the capabilities and limitations of co-workers. In such situations nurses may work on blind trust when seeking information.

Someone new who is inexperienced, they don't know who to ask and so you, the new inexperienced person just has to find their feet and it's, that's life. In any situation you just have to work out who to trust and who your support person is and you have a TL [team leader] and hopefully the new people get looked after. Abigail, RN

Trust was also an important issue when the organisation's documents were accessed as sources of information. Such documents often represented a compilation of research and practice recommendations that are used to guide clinical practice. As David suggested,

I just go on the fact that if you have a policy on the intranet then you have obviously [it has been developed and checked] so, I presume they [the

references] are there because they are good reference articles. But once again I'm trusting who ever developed that.

In summary, definitive strategies for assessing information veracity were not well described by the participants. The preference to obtain information from other people meant that evaluation of the individual often occurred without a critical appraisal of the information itself. Authority and clinical credibility of an individual were important characteristics when selecting who to approach for information. Independent corroboration of information wasn't common although featured when clinical uncertainty persisted. Determining plausibility of information was considered valuable by those giving information but not necessarily by those receiving the information, possibly as a result of inadequate knowledge and an inability to determine plausibility.

4.4.4 The nature of inquiry

The nature of inquiry depicted in the data obtained during the Think Aloud stage of data collection suggests that inquiry was primarily to enable task completion rather than to improve understanding. For most, the process of accessing information to help with clinical decision making ended when they obtained resolution to their uncertainty and did not appear to prompt reflection on practice that would lead to seeking additional information to enhance understanding.

Well, I suppose that if there is no query and there is no information that comes to them that makes them query what they are doing then they will probably carry on doing what they are doing. Robert, RN

John described a process of needing to resolve the clinical query immediately and also identified the importance of further exploring the issue to develop understanding, an approach to obtaining information that was not echoed by others.

I would probably ask someone to resolve that instantaneous perplexion [sic] I had but then I would go to the computer program, look up a

manual, a chart, something like that that was relevant to [the work area]. And then ultimately, as I have done in the past, I would try and sort it out at an appropriate time. Sort it out and get an unequivocal answer to it.

Seeking information solely for the purpose of gaining information (rather than to inform a decision) was described by three participants. Hannah, who had four years clinical experience, described needing information because “someone had something, some funny disease and I wanted to look that up” while David described seeking information because of “an interest” and Robert would look for more information if “[he] was really passionate about something”. However, seeking information for the purpose of understanding was not described by any participants as being something that occurred on a regular basis, but rather infrequently. Making information readily available and nurses knowing how and where to locate it did not encourage its access. The website was characterised as “having a lot of stuff on it” but Patricia had not “really gone on it and become familiar with the different things”. There was some evidence that the level of clinical experience impacted on the level and type of inquiry where for example for less experienced nurses survival in the clinical area is their main concern and it is not until they become more experienced that they began to consider the need for information more strategically.

The more senior you are, yeah, you understand the reasons why it [research and information] is important. The more junior you are the more time you spend in trying to work out what you are doing and just do what you are told. [For more senior nurses there is] less time thinking what we have to do, and we think why. David, RN

However, for Abigail who had 15 years experience, the focus of clinical practice was squarely on the issue of patient safety, a concept that didn't seem to encompass an ability to provide information to others or the ongoing attainment of knowledge. For her, it was possible to be a good nurse, at the level of Clinical Nurse Specialist, despite an inability to communicate information effectively to others. For Abigail, an inability to communicate knowledge may have been linked

to how she viewed her own strengths and limitations in terms of fulfilling a Clinical Nurse Specialist role and an unrealistic expectation that nurses within this role are able to be all things to all people.

Because you can't be perfect in all areas and I feel, especially me, I'm a Clinical Nurse Specialist, and I'm not very good at articulating my knowledge. And so, you can't be perfect at all areas. People are better at some things than others. And they might be good at clinical practice and they might be safe but they might not be good at conveying that type of information. You can't be perfect in all areas. And I'm certainly not good at articulating my knowledge but I still think that, um, that my qualifications of Clinical Nurse Specialist are alright. Abigail, RN

For those nurses involved in direct patient care, seeking information seemed to be predominantly focused on acquiring facts that might assist in making a clinical decision and there was little evidence that the episode of clinical uncertainty may present an opportunity for critical dialogue, a deeper understanding of an issue and the development of critical analysis. This type of interaction in the clinical setting was described by senior nurse clinicians as being critical for developing clinical nurses.

And if you get a group of people, some of the most powerful ways of sending out all that information is then...for example, if [we] were working in the clinical environment and if you saw one of us doing something different we would always ask what they were doing and you would debate why someone was doing it [that way] and you'd end up with three or four people debating what is correct until you find out...I think that is extremely powerful. Reid, senior nurse clinician

The importance of critical dialogue at the bedside was recognised and encouraged during performance reviews and identified as an area of development for clinical nurses. However getting individuals to adopt this practice was problematic. Jessika, a senior nurse clinician suggested that a hesitancy to engage in critical dialogue may be because individuals may not want to “take ownership

for their criticism or they do not want to direct this at anyone in particular” while Sharon, another senior nurse clinician suggested that they “may not have the skills to initiate or participate in this dialogue in a constructive way”.

Reflection on changes in the work environment and culture at case site 1 suggested that this type of critical dialogue was more prevalent in the past and may have been because clinical nurses who role modelled this type of inquiry no longer worked in the clinical area on a regular basis. While this type of critical inquiry was demonstrated by Clinical Nurse Educators there was a clear need for the practice to be more widespread.

I think it's led by the educators but I don't think that we see enough of the Clinical Nurse Specialists or experienced staff [leading critical discussions or inquiry] Bryan, senior nurse clinician

Developing individual clinical nurses and a culture of inquiry was a goal of many of the senior nurse clinicians and Eden described the need to try and “eradicate our roles” however achieving this seemed problematic because of staff retention and an evolving workplace. The notion that clinical nurses working at the bedside could, or should, assume some responsibility for advanced clinical decision making and clinical leadership was posited by Eden and Sharon, two of the senior nurse clinicians who described previously working in such environments.

There wasn't a Clinical Nurse Specialist or anything and so you came on and you had a junior with you and worked together and that was the story. And things like orientation happened on a Monday morning and you provided the lectures for that. We didn't have anyone facilitating it. Eden, senior nurse clinician

The view that the current structure of providing clinical leadership and education could change and still be effective was strongly contested by Reid. The idea that such a system could work without someone in a dedicated leadership

position was not considered realistic and was viewed as an idiosyncratic opinion of one individual.

I think you're making a presumption that everybody thinks the same way that you do. Reid, senior nurse clinician

Confirmation that clinical environments can function effectively in terms of clinical leadership and education when leadership roles are less clearly defined was clearly articulated and supported by Sharon although Reid was greatly surprised by her assertion. Both Eden and Sharon seemed open to alternate approaches to developing critical inquiry and had a clear focus on developing individuals for independent decision making and lifelong learning. Reid described an alternate approach whereby dedicated clinical leadership and education roles were important for providing processed and consolidated information because clinicians working at consolidating information independently may further contribute to variability in practice. There was also the perception that the time required to conduct critical inquiry was not available, suggesting that clinical nurses were only able to undertake these activities during paid work.

There will never be enough time for people at the bedside to achieve what we achieve in running workshops and those sorts of things. Reid, senior nurse clinician

While information is seen as important for both decision making and for increasing knowledge levels, there was a preference for information to be obtained passively. All participants valued the notion of current and accurate information to support their practice but few were inclined to be proactive in this regard. When asked about gaining general information in relation to clinical practice, Abigail did not look to the literature as a source of information but rather preferred obtaining information through in-services or conferences because “You don’t have to read it. The information is handed to you on a platter.” The desire to have pre-processed information was associated with the lack of time available to look at literature on an individual basis consequently having a dedicated person to sift through the information was seen as a potential benefit.

I wish that there was someone to trust to go out to the papers out there. In fact they [the educators] did this. They got two or three really good papers and put those in a folder for us to read, and that is fantastic. Saves you hours and hours of searching to just find crap that you throw away.

Patricia, RN

Recognising quality of information was also seen as difficult and was another reason for wanting information to be available from a secondary source, such as a trusted colleague or someone seen as having the skill and knowledge to discern good information from bad.

So if there was sort of a filter, like an editor of a journal, that is telling you that it [this paper] is really good. Saves you searching through thousands of papers to try and find what you are looking for. Patricia, RN

On the most part participants valued and used personal communication as their preferred source of information and very little mention was made of using text-based resources, particularly original source material that had yet to undergo some form of pre-processing, such as clinical practice guidelines or protocols. Not having the skills to locate or evaluate literature was identified as being a problem for some of the participants.

Comprehending the research can be tricky, validating it, is it worth adapting? Is it a valid study, that kind of stuff, is it applicable to the patient? David, RN

Although some participants self-identified as not having the skills to locate and appraise the literature, they also didn't discuss strategies to improve their knowledge and skill in this area or even view this as an important aspect of professional development. When asked about the use of library services to assist with research skills the lack of interest was palpable when Hannah replied that "I don't even know where it [the library] is".

Accessing the literature, and research in particular, was not described well by the participants and was not demonstrated during the two-hour period of data

collection. The participants also identified the use of research findings as an infrequent source of information considered by clinicians.

No I don't think they [clinical nurses] do [use research findings]. I think overall they, the lower the level, a lot of them are there to come to work to finish the day and go home, then worry about the day after. In saying that I don't really have any idea what they are like but certainly in their clinical practice they don't [use research findings]. John, RN

Nurses working in specialty practice were described by Patricia as being more frequent users of research than colleagues working on general wards, but still noted that research use in general was infrequent.

I think intensive care unit nurses seem a little bit better on that front than the general nurses but I don't know that you would call it routine. Just now and then.

While the use of research by nurses working at the bedside was recognised as being infrequent and inconsistent, nurses working in education or nursing leadership positions, such as the Clinical Nurse Educators and Clinical Nurse Consultant, were recognised for a more active use of research in their practice. For John, those individuals in educator or consultant positions may be more driven to use the literature to develop an understanding of their practice.

...they have a particular research bent, they like to be involved. They are inquisitive. They like to see it and they like to prove it. I don't know how much they actually do themselves, but they read. They read, they are looking at different things, for explanations. Full explanations. John, RN

4.5 Conclusion

In this chapter a description of case site 1 is provided, in particular, details of the research infrastructure, the basis for theoretical replication in this study. The intensive care unit at case site 1 was actively involved in both nursing and medical research. The findings of this study include decisions made by registered nurses

and highlight the reluctance of some nurses to independently make decisions. Information used to support clinical decision making is identified and highlights the preference for personal communication as information, likely because colleagues were seen as the most useful and accessible sources of information when information was required to resolve clinical uncertainty. Veracity was an important aspect of information highlighted and accordingly characteristics such as authority, independent corroboration, plausibility and presentation that align with information veracity are described. The chapter concludes by addressing the nature of inquiry at case site 1 and highlights the lack of inquiry extending beyond task completion.

CHAPTER 5

CASE SITE 2

5.1 Introduction

This chapter details the findings from case site 2. A full description of this case site is initially provided and details characteristics of this intensive care unit including the level of clinical support available, the research and development infrastructure, nursing contribution to research, information technology provision, local university links and information sources available to clinicians. The study participants for each phase of data collection are then described. Section 4 presents the findings of data analysis and major themes identified for this case site were the same as case site 1 and which include making decisions, information used to support clinical decisions, the veracity of information and the nature of inquiry. An additional theme identified at case site 2 was workplace culture and information use.

5.2 Case site description

Case site 2 was an intensive care unit in a 185-bed metropolitan hospital. The hospital was accredited by the Australian Council on Healthcare Standards and was located in Area Health Service in New South Wales, Australia. This hospital served a population of approximately 230,000 and provided a full range of district hospital services to the local community including emergency medicine, surgery, medicine, critical care and dental health. The hospital was a university affiliated teaching hospital, providing clinical placements to both medical and nursing students.

5.2.1 The intensive care unit

This intensive care unit was an eight bed, Level II mixed intensive care unit/cardiac care unit with the capacity to invasively ventilate three patients at any

given time. Adult critically ill patients with a range of APACHE III diagnoses were admitted to this unit. Patients with surgical neurological, cardiothoracic and trauma diagnoses, non-operative neurological or trauma diagnoses, severe burns or spinal injuries were transferred to a tertiary referral centre specialising in these areas.

The intensive care unit was managed by a Level 3 Nurse Unit Manager and was staffed with one Clinical Nurse Consultant (0.5 full-time equivalent) and a full-time Clinical Nurse Educator who provided support for education, clinical practice and research. Full descriptions of these positions are provided in the glossary (p.xv). A Professor of Critical Care Nursing employed by the Area Health Service was available for consultation but located at another hospital approximately 20 km away.

Only registered nurses were employed to provide nursing care in this intensive care unit. There were 32 registered nurses employed in this unit for a 22.8 full-time equivalent. Fifteen registered nurses (47%) had completed a post-registration or postgraduate specialty qualification in critical care.

Four Staff Specialists provided medical care in the unit and were supported by one Senior Registrar in Respiratory Medicine and four Resident Medical Officers who covered the unit 24 hours per day, seven days a week. Allied health support was available in the areas of social work, dietetics, and pharmacy, although these were not unit-specific positions.

5.2.2 Research and development infrastructure

Research involvement at case site 2 was minimal during the period of data collection. No medically or nursing driven research was conducted although the intensive care unit participated in screening patients for two external research projects. Publications arising from the intensive care unit were limited to those by staff specialists who worked in the intensive care unit. No nursing publications were identified. Of the eight publications for the 2004-2005 period, none were specific to intensive care practice, possibly because the staff specialists working

within the intensive care unit were not career intensivists, but held qualifications in other specialty areas. Funding for intensive care research had not been applied for in some years.

5.2.3 Nursing contribution to research

No nursing research was being conducted at case site 2 although the Clinical Nurse Consultant assisted with identifying and recruiting patients for two external studies.

5.2.4 Information technology provision

Access to information technology was limited within the intensive care unit. One computer with intranet and internet access was available. Through intranet access a hospital library external to case site 2 could be accessed. The computer was used mainly issues relating directly to patient care, such as for accessing pathology results and updating diet orders.

5.2.5 Level of Clinical Support

The nursing staff in the intensive care unit was supported by one full-time Clinical Nurse Educator and a full-time Clinical Nurse Consultant, whose responsibilities were split between two intensive care units. The Clinical Nurse Consultant had primary responsibility for nursing practice development within the unit and worked collaboratively with the Clinical Nurse Educator to provide unit-based informal education.

5.2.6 Local university links

Two local universities were linked to the hospital, both with well established Nursing and Midwifery Faculties that provided education at undergraduate and postgraduate levels. One university also had a Medical Faculty. Postgraduate coursework and research programs were offered at both universities to a doctoral level. No nurses at case site 2 had appointments at any university. Three of the

four medical Staff Specialists had university clinical appointments at the Lecturer, Senior Lecturer and Associate Professor level.

5.2.7 Information sources available to clinical nurses

Within the intensive care unit there were several different sources of print and electronic-based information available (Table 5.1), some of which were specifically related to enteral feeding. In the intensive care unit there was a large amount of print-based sources of information available but only one computer was available for all intensive care unit staff to access. The computer in the intensive care unit was configured to allow access to the case site 1 intensive care unit webpage and the resources made available there.

A document audit was conducted in mid 2006. The majority of information at case site 2 was available in a print-based format. There were over 20 posters placed in various positions within the intensive care unit. Some were professionally prepared and others appeared to have been developed by clinicians, possibly as part of ongoing study. Five different policy folders were available, although information specific to enteral feeding was not contained in any of these. There were six folders containing learning materials, two of which were prepared by an educational institution and had been critically reviewed prior to publication.

In the intensive care unit staff room, 51 textbooks were located, 23 of which were specific to nursing practice and eight which were related to critical care practice. Only three of these texts were less than five years old. The most current text was one year old. Of the remaining 48 texts, the majority were published in the early to mid 1990s and the oldest textbook was published in 1937. There were 125 peer-reviewed journal articles located. Fifteen of these had been published in the last five years and the most recently published article was three years old. One article dated back to 1987. Complete issues were also located and represented seven different journals, four of which were specific to critical care nursing. Publication dates for these journals ranged from 1998-2004.

Less than 25% of the journal articles located was research-based and the vast majority were in traditional literature review or case study format. Some documented policies and procedures contained a reference list but how the policies or procedures were informed by available research was not clear.

Table 5.1 Electronic and print-based sources of information available at case site 2 (number of resources specific to enteral feeding)

Print-based	Electronic
Intensive care unit policy (0)	Textbook
Hospital policy (1)	Peer-reviewed journals
Learning materials (0)	Intranet
Textbook (0)	Internet
Poster (0)	
Commercial information (0)	

5.3 Study participants

All registered nurses working in this intensive care unit had the opportunity to be involved in this study. Registered nurses with specific responsibility for the provision of patient care were invited to participate in Stages 1 (Think Aloud) and 2 (Q sort) of data collection. Those registered nurses with specific responsibility for staff development and education were invited to participate in Stage 3 (Focus Groups) and are hereafter identified as senior nurse clinician. Details of participants for each data collection stage are provided below. Data obtained from participants and reported in this thesis has been de-identified and pseudonyms used.

5.3.1 Stage one – Think aloud participants

Six registered nurses participated in this stage of the study and demographic data are contained in Table 5.2. Three participants had no experience with clinical

research and three had experience with data collection. Only one participant had previous research experience as an investigator.

Table 5.2 Case site 1: Demographics for thinking aloud participants (n=6)

Characteristics	Categories	Number
Age	21-25	1
	26-30	1
	31-34	3
	45+	1
Gender	Male	1
	Female	5
Number of years as a registered nurse	1-2	0
	3-5	2
	6-10	3
	11-15	1
Years experience in critical care – Mean (range)		3 (1-7)
Initial nursing qualification	General (hospital) certificate	0
	Diploma of Nursing	3
	Bachelor of Nursing	3
Highest qualification in nursing	Bachelor of Nursing	2
	Graduate Certificate	4
Specialty qualifications*	Intensive Care (Adult)	3
	Critical Care	1

one participant had a hospital based post-registration specialty qualification at the certificate level

* Four participants had specialty qualifications at the Graduate Certificate level. Two participants did not hold a specialty qualification.

5.3.2 Stage two – Q sort participants

An invitation to participate in the Q sort stage of the project was extended to all (n=32) registered nurses employed in the intensive care unit. Of the 32 registered nurses invited to participate, one was on annual leave at the time the Q sort was distributed. Following discussion with the Nursing Unit Manager, letters of invitation and the Q sorts themselves were distributed through the internal staff mail system in the intensive care unit with a message left in the staff communication book. Registered nurses (n=4) who were working at the time of initial distribution had invitations and the Q sorts hand-delivered and a personal request was made to inform other staff during handover.

Obtaining completed Q sorts proved to be problematic at case site 2 so the process by which these were sought is described in detail. Two weeks after the Q sorts had initially been distributed none had been returned. A return visit to site 2 revealed that all 32 envelopes had been removed from the area allocated for internal mail and had been placed on the bottom of a trolley used for television viewing by patients. No envelope had been taken by any participant. The failure of this distribution process was discussed with the Nursing Unit Manager and Clinical Nurse Consultant who indicated that they were willing to act as champions for this stage of data collection. Three weeks after the initial distribution, no completed Q sorts had been returned.

Permission was obtained from the Nursing Unit Manager to conduct periodic site visits to encourage participants to complete the Q sort and assurance was given that staff were being encouraged to complete the Q sorts at work, as time permitted. Site visits were conducted three times a week (at random times) for a two-week period. Site visits included one-on-one explanation of the study, its purpose and directions for how to complete the Q sort. On two occasions the nurse-to-patient ratio was 2:1 suggesting sufficient time for completion of the Q sort during work time. Because participation in this stage of the study was problematic, permission was sought from the Ethics committee to include an incentive related to completion of the Q sorts. The incentive was not directed to

any one individual but was to provide a \$15 contribution to the upcoming staff party for each Q sort completed. Despite increased efforts to recruit participants no Q sorts had been returned. At this point the incentive was changed so that a direct, but negligible, benefit was included for participants who completed the Q sorts; for every completed Q sort obtained the participant would receive two movie tickets that could be used at a time of their choosing. As a result of these extensive recruitment strategies only five participants completed and returned both Q sorts, reflecting a response rate of 16% at this site.

The majority of participants were female (n=4) and employed as a registered nurse (n=3); two were employed as Clinical Nurse Specialists. The mean length of experience in critical care was 6.5 years (range 2-12). Only two participants completed a Bachelor of Nursing as their initial nursing qualification with two participants completing hospital based certificates and one completing a Diploma of Nursing. All participants had a post-registration qualification at a Graduate Certificate level.

5.3.3 Stage three – Focus group participants

Focus group participants were sought from those registered nurses working in leadership positions in the Site 2 intensive care unit. All who were invited to participate chose to do so. The focus group consisted of the Nursing Unit Manager, the Clinical Nurse Consultant and Clinical Nurse Educator. Two focus group participants were female and one was male. The mean age was 46 years (range 33-52) and participants had an average of 19 (range 12-33) years nursing experience. One participant held a hospital certificate in Intensive Care Nursing, one held a Graduate Certificate in Intensive Care Nursing and the third held a Masters of Critical Care Nursing.

5.4 Case site 2 findings

This section presents the findings from case site 2. Five key findings were identified in the data from this case site making decisions, information sources

used to support clinical decisions, the veracity of information, the nature of inquiry and organisational culture and information use.

5.4.1 Making Decisions

Decision making was explored in the context of enteral feeding practice during the Think Aloud stage of the project where concurrent and retrospective verbal protocols were used as data collection methods. The focus group interview with senior clinical nurses provided additional insight into issues that impact on decision making in clinical practice. Enteral feeding related decisions were made by doctors, dietitians and registered nurses, although largely these decisions were not made in a consultative fashion. The decision to start feeding clearly stayed with the medical team although both medicine and dietetics were involved in recommending feed type as well as initial and subsequent rates of feeding. Collaborative decision making regarding enteral feeding rarely occurred and the nurse would often consider recommendations from doctors and the dietitian, seeking clarification where disparity occurred.

The absence of an enteral feeding protocol at case site 2 influenced independent decisions made by nurses and contributed to an increased variability in clinical practice. For example, each of the six participants described a different strategy for determining feeding tolerance and had a different threshold for what they considered to be high gastric residual volumes. When making independent decisions, some nurses reflected on previous experience and used this to guide their decisions while others were able to provide a rationale for their decision.

I measure the gastric residual volumes that often because I used to work on a gastrosurgical [sic] ward and we always used to do them 4-6 hourly just to check that there were no aspirates. Jordan, RN

I consider that an average aspirate, not high certainly. And if it was any other patient I would have increased the feed. The reason why I didn't increase the feed at that time was...there may have been blood coming out of her NG tube...and she had a history of not absorbing feeds as well. And

because she was getting the TPN I thought it was more important just to keep the NG feeds trickling in knowing that she was still getting some nutrition rather than trying to push and increase the feeds up to a goal rate. Lynn, RN

Not having an enteral feeding specific policy was viewed in a positive light by Jasmin, a senior nurse clinician whose view was that absence of specific direction led to a higher degree of critical thought regarding clinical practice.

*The upside is that hopefully it encourages nurses to think a little more rather than being policy driven. We are registered and have been to university. We are meant to be able to critically evaluate and think about things so it gives the nurses a bit of autonomy I think. It **encourages** them to use the brain hopefully.*

Some participants made independent decisions more frequently than others and to some degree this was a reflection of clinical experience in critical care. While some participants were willing to make decisions and were able to explain rationales for these decisions, others looked for guidance and structure, mostly in terms of the opinion of others or reflecting back on previous experience or normal clinical practice in other workplaces.

I think that some people need more written prompts. Some people need a lot of structure. So they are much more protocol based sort of nurses. I guess more junior nurses need more definitive guidelines because they usually haven't developed the extra decision making through experience. Lynn, RN

While not all decisions were independently made or implemented, some nurses were proactive in suggesting changes to the patient management strategy as well as guiding medical decisions and influencing patient care.

If there is a perceived trend of feeding intolerance then it is usually a nurse who initiates the maxalon. We would ask the resident to order the maxalon, if they agree with putting them on it for gut motility. It is usually

not medically initiated and is not a standard thing either. Probably more senior nurses who have a greater understanding of the importance of enteral feeding [would do this]. If the patient didn't have the backup of TPN and was relying only on enteral feeding, then a nurse may push that more – junior or senior. Lynn, RN

Deferring decisions to the medical team occurred when uncertainty about clinical practice occurred or when the nurse was reluctant to assume responsibility for the decision. Beverley described feeling uncertain about making a decision regarding feeding tube placement even though clinical assessment was undertaken to help to determine whether the tube was in the correct position. Jordan also alluded to the need to be “safe” and “a more litigious society” on more than one occasion and indirectly suggested that deferring decisions to the medical team was a personal protective strategy.

...if someone pulled their NG tube overnight you'd put a new one in, have a listen, have a bubble, ... have a listen, do a pH and then generally you'd say to the doctor 'Do you want an X ray?'. Generally it is up to the doctor. If they said no, then I'd be fine with that. I'd just say, 'Can you document that the X ray hasn't been done but that you are happy it is in the right place'. I'm quite happy with that.

...if I get a large aspirate and it is more than 200 mls I generally just say to a doctor as they go past 'they just had a large aspirate. It is 350 mls' and I just show it to them... 'see this is what I've got. Do you want me to discard it or do you want me to put it back?' And I just go on what they say.

For some nurses a perceived boundary associated with independent decision making was articulated and there was a need to be seen practicing in line with what was considered normal clinical practice in this intensive care unit. For Ebony noting an increase in the rate of feeding was a sufficient change in the enteral feeding strategy and caused her to seek clarification and ensure that nurses hadn't made a decision for which they had no authority.

I noticed ...in the written notes that [the dietician] had said a goal rate of 65 mls/hr and it was actually [running at] 80 mls/hr. So I spoke to the dietician. I'm not really sure what I was concerned about. I was concerned that we had kind of taken it off our own back to, from a nursing perspective, to increase [the feeds] to 80 mls.

Boundaries were also associated with the norm of practice for that particular intensive care unit with several participants following established practice in an unquestioning manner.

Yeah, you don't think actively about doing this aspirate because of this, you just do it because he is being fed and you just do it every 4-6 hours.
Niki, RN

I've never actually seen anything documented that we need to do gastric aspirates 4th hourly but it just seems to be the thing that everyone does. It is part of the routine. Beverley, RN

From when you learn intensive care and you are told this is the way you do it, this is why we do it, and then you go off and go, OK, this is the way it is. Jordan, RN

For others, boundaries were seen as less rigid. Kim considered a doctor's recommendation as a guideline only which should be interpreted in the context of a patient's clinical presentation and modified as the nurse thought necessary while Jordan was willing to work outside the norm of clinical practice provided there was a logical reason to do so.

I think [the frequency of measuring gastric residual volume] would come from the doctor ordering it. But from a nursing point of view I tend to look at that sort of thing myself anyway. If I felt the patient's condition would be compromised by [sticking to the frequency recommended] then I would do it more often if I felt it needed it. Kim, RN

Most of the policies and procedures I've learned from being told and if I think that is crap, I don't agree with that...there are things here that just bug the shit out of me. And I've said this is the latest research that I can find...and they can say 'this is how we do it here'. And I've actually said at certain times 'this is what the latest research shows and I'm not going to do that'. Ultimately that is on my shoulders. Jordan, RN

However, inconsistencies in how the medical team viewed nurses making independent decisions led to further uncertainty and the perception of inconsistency within the intensive care unit.

...speaking of...autonomy, one of the intensivists, if you look like making some sort of decision [about weaning] he pounces from a great height. Whereas I know another one of them complains that nobody ever sort of makes any decisions. Nobody takes the initiative to try and do it. Norman, senior nurse clinician

I think I know what you're talking about and a definite issue at the moment ...we have...we used to have three sets of intensivists and that was it. We knew exactly where and there was consistency in all the rest of it. Now we have so many, we have ring-ins from everywhere, there's no consistency and you're never quite sure where you can go. Jasmin, senior nurse clinician

5.4.2 Information sources used to support clinical decisions

The sources of information identified during the think aloud stage of data collection at case site 2 included people, print- and electronic-based media. While the volume of print-based resources was numerous it did not appear that this information was regularly accessed which may have been why Jordan initially commented that “We don't have heaps of stuff” but later indicated that

...there is a lot of documentation. There is a lot in this office, you can see there all the bits and pieces. So quite often if I am sitting and thinking I'm not sure if I can't find anything I'll ask [the Nursing Unit Manager] do

you have anything in your office? And in the educators [office] there are folders, all kinds of stuff.

The information available at case site 2, although extensive, didn't seem to be visible to many nurses. Centrally located and noticeable, the print-based information sources were only referred to by two participants although neither seemed to rely on these information sources to any extent. Not recognising the print-based information as potential sources of information was highlighted by two participants.

So I think that if it is night duty and you have no other resources to go by other than what your colleagues say, then you just have to make the decision that you think is appropriate, I think. Niki, RN

I can't say that I have ever come in here and gone through the information and I don't think as far as outside in the unit on the shelves. Jordan, RN

People featured heavily as the preferred source(s) of information for most participants. Jordan described the process of seeking information with "first port of call is to ask somebody" and usually a more senior member of staff was referred to as a person to approach for information.

...depending on the level of the problem that I am faced with I would usually go to the next senior nurse, usually the first thing I would do, to nut that out. Lynn, RN

The reliance on people as sources of information was evident with few participants identifying alternate sources. A hierarchical approach to seeking information from others was represented by Lynn who indicated that "...I'll keep going higher if I am not happy with the answer". However, obtaining information from multiple individuals was problematic in that there was the potential to end up with conflicting opinions, further exacerbating uncertainty.

I try to make a decision on that information that you have been given, even if it is conflicting. And you ask other professionals so if they don't...if you

are getting conflicting answers then it is sort of hard to know exactly what the right thing is to do. Niki, RN

When the uncertainty continued Niki indicated that she would seek clarification through relevant policy documents. However, the use of policy and procedures as a source of information wasn't a key feature for most participants. In fact, none of the participants were able to indicate with any certainty whether a policy or procedure relating to enteral feeding practice existed or not. The issue of safe practice was associated with using policy and/or procedure documents and was preferred to people as a source of information despite uncertainty about the quality of these documents.

I'd go to a clinical policy and procedure file because they are there and that is what they are there for. I find that I like using policies because it is safe... but don't think the policy documents available [here] are based on best available practice. Ebony, RN

For another, the usefulness of policy documents was acknowledged and it was indicated that they would be considered as a source of information, particularly if the area in question related to inexperience or lack of knowledge in the area. However, a policy or procedure document would only be used to inform practice when information could not be obtained from a colleague.

There have been times when I have gone through the policy, but usually the people are pretty good at helping you if they know. There aren't that many times that I have had to go and get a policy out because there are usually people there that know how to do it. Niki, RN

5.4.2.1 Usefulness of information

Perspectives on the usefulness of information sources available at case site 2 were sought using a Q methodological approach where participants were asked to consider a clinical scenario and sort sources of information from most to least useful. As previously detailed, the completion of Q sorts at this site was problematic despite multiple attempts and incentives to complete the Q sort and

only five registered nurses participated in this stage of the research (response rate 16%). Q factor analysis was not successful with this number of responses and could not be reported for this site.

Although little data was acquired through this process data were analysed using descriptive statistics to determine how individual sources of information were ranked in terms of usefulness. Information sources ranked from +6 to +2 were considered useful, those ranked from +1 to -1 were considered uncertain, and those ranked from -2 to -6 were considered not useful. Information sources with a frequency of 50% or greater were grouped into one category as were those that had a frequency of less than 50% (Table 5.3). This analysis indicated that again people were considered the most useful sources of information to assist with resolving uncertainty. The only people not considered useful were those registered nurses with less experience and those external to the intensive care unit or hospital.

Print-based information sources, although numerous at this site, were largely perceived as not useful. Only print-based intensive care unit policy and procedure documents and systematic review were considered useful by these participants. An understanding of the perspectives on the usefulness of information was obtained primarily through the descriptive data obtained from the Q sort process as during the Think Aloud process no clear references to usefulness of information were made. It is possible that the overwhelming reliance on people as sources of information influenced the consideration of information usefulness. Print-based information did not feature strongly in the Think Aloud data and was often only discussed in response to direct questioning. Failure to recognise this material as a potential information source may have been because it was not perceived to be useful and over time had therefore become an unacknowledged part of the environment.

Table 5.3 Usefulness of information sources for case site 2

	Useful	Not useful	Uncertain
>50%	<p>Clinical Nurse Consultant</p> <p>Clinical Nurse Educator</p> <p>Clinical Nurse Specialist</p> <p>Registered Nurse (more experience)</p> <p>Registered Nurse (same experience)</p> <p>Resident Medical Officer</p> <p>Registrar</p> <p>Intensivist</p> <p>Dietician</p> <p>Personal Experience</p> <p>Nursing Unit Manager</p> <p>Inservice</p> <p>Handover</p> <p>ICU policy and procedure</p> <p>Systematic review^b</p> <p>Hospital policy and procedure^{a,c}</p>	<p>Course materials</p> <p>Infection Control Policy</p> <p>Manual</p> <p>MIMS</p> <p>Poster – corporate</p> <p>Library – hospital</p> <p>Conference information</p> <p>Pharmacy guidelines</p> <p>ICU drug manual</p> <p>RMO manual</p> <p>ICU orientation manual</p> <p>Systematic Review^b</p> <p>Original Research^b</p> <p>Textbook^b</p> <p>Clinical practice guideline</p> <p>Clinical Information</p> <p>Access Project#</p> <p>Video</p> <p>Electronic journal databases</p> <p>Joanna Briggs website</p>	<p>Hospital Registered Nurse</p> <p>Product information</p> <p>Poster – clinician</p> <p>ICU website^c</p> <p>Hospital Policy and procedures^{a,c}</p> <p>Cochrane database</p> <p>Pre registration education</p>
<50%	<p>Registered Nurse (less experience)^a</p> <p>Registered Nurse (another hospital)^a</p> <p>Learning resources^a</p> <p>Library^c</p>	<p>Registered Nurse (less experience)^a</p> <p>Registered Nurse (another hospital)^a</p> <p>Original research^{a,b}</p> <p>Textbook^a</p> <p>Case study^{a,b}</p> <p>Clinical practice guideline^a</p> <p>Literature review^{a,b}</p> <p>Learning resources^a</p> <p>Literature review^a</p> <p>Internet^a</p> <p>Library (another hospital online)</p>	<p>Original research^{a,b}</p> <p>Textbook^{a,b}</p> <p>Case study^{a,b}</p> <p>Clinical practice guideline^a</p> <p>Literature review^{a,b}</p> <p>Learning resources^a</p> <p>Literature review^a</p> <p>Internet^a</p>

^a equal scores for more than one category

^b published, peer-reviewed information source

^c information from another hospital

Red text = personal communication

Green text = print-based information source

Blue text = electronic information source

Abbreviations listed on p. xv

5.4.2.2 Accessibility of information

In terms of accessibility, people again were considered the most accessible, with the exception of those whose primary work was conducted outside the intensive care unit (Table 5.4). Both electronic and print-based information rated poorly in terms of accessibility. Although print-based information was available, being able to physically access this information made its use problematic.

I've looked at what is here out of hours. Like I wouldn't look in, because it is such a tiny little room [the Clinical Nurse Educator's room] it is a bit hard to walk in and go through things when there is one person in here. And I don't think it is a good system implemented there. It could be a lot easier to access. The shelves are really high and you know, they are stacked on top of each other. It is not really organised at all. Kim, RN

Electronic information also rated poorly (Table 5.4). This is likely because there was only one working computer available at case site 2 and this was shared by medical, nursing and administrative staff. The issue of computer access was highlighted by the senior nurse clinicians, who commented,

The lack of computers and the ease of getting on to the computer – 'cause you've got one computer, and every man and his dog is competing for it – you can almost certainly guarantee that you are going to get kicked off... Jasmin, senior nurse clinician

Inadequate electronic access to information was considered a major impediment to information access at case site 2 and the need for an improvement in access was echoed by clinical nurses and senior nurse clinicians. Facilitating access to other sources of information was not considered a priority and there was no intentional or systematic strategy to ensure access to information in the clinical area. The only print-based source of information considered worth providing was the medical textbook, *Oh's Intensive Care Manual* (Bersten et al. 2003). Acquisition of other textbooks was not considered viable because, as Jasmin, a senior nurse clinician described, "they just walk". Norman, another senior nurse clinician felt that the responsibility for acquiring resources rested at an individual

level and suggested that nurses should “buy [their] own book” and be responsible for building a personal library. Current journals were available at case site 2 on an ad hoc basis but the accessibility of these journals was reliant on sharing of a personal subscription.

We don't systematically [provide information]. I get my journals at home, I read them and then I put them in the tea room hoping that someone might pick them up instead of the Woman's Day and at least maybe read one article in there. Jasmin, senior nurse clinician

Table 5.4 Accessibility of information sources for case site 2

	Accessible	Not accessible	Uncertain
>50%	Clinical Nurse Consultant	Systematic review ^b	Handover
	Clinical Nurse Specialist	Original research ^b	Library
	Clinical Nurse Educator	Textbook ^b	Library (another hospital)
	Registered Nurse (more experience)	Case study ^b	RMO Handbook
	Registered Nurse (less experience)	Literature review ^b	Video
	Registered Nurse (same experience)	Poster (clinician)	
	Resident Medical Officer	Poster (corporate)	
	Registrar	Pre-registration notes	
	Intensivist	Conference abstracts	
	Nursing Unit Manager	Clinical practice guideline	
	Personal experience	Course materials	
	Inservice	Systematic review ^b	
	ICU policy manual	Original research ^b	
	Product information	Case study ^b	
	MIMS	Literature review ^b	
	ICU homepage ^b	Clinical practice guideline	
		Clinical Information Access Project	
	Cochrane database		
	Electronic journal databases		
	Joanna Briggs Institute website		
<50%	Dietician ^a	Dietician ^a	Registered Nurse (other hospital) ^a
	ICU policy and procedure	Registered Nurse (other hospital) ^a	Registered Nurse (ward-based) ^a
	Learning resources ^a	Registered Nurse (ward-based) ^a	Infection control policy ^a
	Internet	Infection control policy ^a	Learning resources ^a
	ICU policy and procedure ^{a,b}	Pharmacy guide ^a	Pharmacy guide ^a
		ICU policy and procedure ^{a,b}	

^a equal scores for more than one category

^b published, peer-reviewed information source

Abbreviations listed on p. xv

Red text = personal communication

Green text = print-based information source

Blue text = electronic information source

5.4.2.3 Research as information to support clinical practice

The use of research to inform clinical practice was not a key feature at case site 2. A culture where research was used to inform practice was not evident. Niki suggested that research based practice was not “in your face” but was not clear why this was the case.

I don't think people really, you know, would go through a research article. I don't know if it is a unit thing or an individual thing. Apart from the [research articles] that the Clinical Nurse Consultant provides [for journal club]...that is sort of the only encouragement that we get.

The integration of research into practice did not appear to be supported by senior nurse clinicians and was an issue discussed at length during the focus group interview.

...maybe it's unrealistic to expect the day to day clinicians to have a full concept of [research use]. I think there's probably a handful of people in every area that have that mindset [to use research to inform practice] but as a general rule I don't think that is appropriate. Alyson, senior nurse clinician

I don't think [clinicians] have it [an ability to use research] but I don't think that it is something we should be striving towards. Jasmin, senior nurse clinician

When discussing how clinicians position themselves to be able to pass information onto others there was uncertainty as to whether more experienced clinical nurses would have the skill and knowledge to formulate a clinical question, locate and appraise the literature. This however was not seen as being problematic because Jasmin, a senior nurse clinician, suggested that the majority of experienced clinical nurses “would have that knowledge. I think the majority of them would be able to provide an answer on the spot”.

Nevertheless the notion of using research was appealing to clinical nurses although the perception was that the only people using research were the Clinical Nurse Consultant and Clinical Nurse Educator. There was an assumption that practice was based on research when Kim commented "...there must be some sort of research that they've done where they say don't fill the bag with more than six hours of feed." When others provided information it was assumed that the information provided was based on research or a plausible rationale even though this was never made explicit.

...there is a presumption that people in various positions use evidence-based practice. If someone goes to a [senior nurse clinician] there's that presumption that whatever they get back is in fact evidence-based and whether or not that is the case I guess depends on where you're coming from and what you're looking at. Alyson, senior nurse clinician

The valuing of research-based practice did not appear to translate into practice, even when evidence-based information suitable for guiding practice was provided.

*One of the staff members has just written a policy on arterial lines, zeroing and getting readings from it and where you should have the transducers. And we don't necessarily do what she has read about in research. In practice we don't meet research ideals. It is the same with suctioning...
Ebony, RN*

The challenge of having research-based practice may relate to the understanding of concepts such as research and evidence-based practice. Many of the participants who spoke about research used language inconsistent with a systematic process of inquiry as illustrated by a quote from Kim.

When we don't know much about a particular thing generally someone, or the educator, will get on the internet and find an article or something.

The lack of a clear understanding of research was attributed to a lack of preparation and education during pre-registration nursing programs which meant

that developing skills and knowledge to facilitate the use of research was something that needed to be done independently or during postgraduate work.

...bear in mind that nursing training doesn't really have any research in it. It's only recently that it is touched upon, very slightly. There's not a lot of research type training in nursing and so these sort of people come out. I mean Clinical Nurse Educators can come out and be quite junior in their interpretation of research and same with more experienced RNs. You look at the RNs that were all hospital trained, and there is still a lot of them out there, there was no research at all and unless they've been diligent in their own education they are not going to be aware. Jasmin, senior nurse clinician

The concerns about having knowledge and skills required to use research to inform practice was reiterated by Kim who commented that research was “difficult to access”.

I don't think that I've had enough exposure to actually go through research articles and come to a decision that someone has conducted that study better than [someone else]. I don't think that I've got the skill to be able to do that. Niki, RN

Other barriers associated with using research in practice included a lack of time and the notion that this work was not something done outside of work hours.

I find it time consuming and so I think it is a time thing. To go through the process of seeking it, comparing it and coming across what you think is probably the most appropriate research and valid. It is a time consuming thing and probably not something that you want to do at the end of a twelve-hour shift and during the day there may not be opportunities to do it. Lynn, RN

5.4.3 Veracity of information

5.4.3.1 Authority

The authority of information was considered in the context of both people as sources of information and print-based material. Authority of information obtained through electronic means was not highlighted. The notion of experience and role played an important part in determining who would be considered as someone who would provide authoritative information as characterised when Jordan commented, “I generally go to more senior people because they have had more exposure in ICU”. However, everyone except Beverley expressed uncertainty about a direct link between experience and a nurse’s level of knowledge.

...even senior people that you ask, some you can sort of, you know that they know what they are talking about and others you think, I’m really not too sure. Niki, RN

Senior nurse clinicians expressed confidence that most experienced nurses working at case site 2 would be authoritative sources of information but also recognised the disparity in the abilities of individuals, particularly at the level of Clinical Nurse Specialist, where it was often assumed by clinicians that someone in this role had a great deal of knowledge and experience. Reflecting on the characteristics of nurses in the Clinical Nurse Specialist role, Alyson commented, “maybe in orientation you could just list [those people who shouldn’t be approached for advice] to warn them...”

Everyone except Beverley described senior or experienced nurses as being variable in terms of accurate or authoritative information. Although Beverley had over six years experience as a registered nurse she had only been working in intensive care unit for one year and considered senior nurses as “all pretty equal in knowledge” and “pretty up there”. Beverley’s criterion for determining whether to seek someone’s opinion was simply to ask “how long they had been in ICU.”

While it was generally thought that someone with more experience would be a more authoritative source of information, there was also recognition of individual expertise, in which case the length of experience in intensive care wasn't considered as strongly.

It doesn't really come down to senior or junior. There are people here who are junior to me in ICU experience but they have done things that I haven't seen because they have worked in other areas. Jordan, RN

A more considered approach for determining the authority of an individual was expressed by Lynn who commented,

I think I would watch their nursing practice. The ones that I would ask I'd watch their nursing practice and the way in which they carry out their nursing care and the decision making processes and there would be like a role model and I can see that they work at a certain level. And the ones that I wouldn't ask, um, they'd work at a different level, or they might have a different decision making process that might not really be the same as mine so therefore I might not understand their decision or feel comfortable with it.

Discussion on the authority of print-based information sources centred primarily on available policies and procedures. Although Lynn described the process of policy and procedure development as being "long and difficult" there remained uncertainty about whether such documents were based on research and best practice because the documents themselves were not transparent in relation to the information or research underpinning the documents. Consequently policies were measured against individual knowledge and experience with Lynn and Jordan articulating the discrepancies between the information contained in hospital policies and current or best practice.

Being involved in policy development made Lynn doubt the authority of such documents because the process of updating the policy reflected "a few words being changed and just some reformatting". So, although policy date was

considered an authoritative quality by some, for others this was not necessarily a clear indicator and additional information was sought, such as on which information the policy was based.

Ebony described a process where establishing clear links between the policy and available research would add authority to the document and suggested inclusion of levels of evidence in the documents. However, for others clear links between research and the policy wouldn't necessarily add weight to the level of authority considered by intensive care staff because of current deficits in understanding about research and its value. For example, Kim commented that using the research wouldn't necessarily make the recommendation any more correct because "someone who reviews research, it is only their opinion" while Beverley commented that "I don't even know what levels of evidence are". These weren't necessarily issues relevant for individual nurses but something that was perceived to be widespread at case site 2 as Jordan stated "I think that 99% of nurses would ask 'What is research'".

5.4.3.2 Independent corroboration

Most participants seemed to be content with seeking one source of information provided it addressed the immediate problem. For the most part seeking additional sources of information was about reducing the uncertainty associated with an area of clinical practice; it was not about independently corroborating information with the view to determine the best course of action. Descriptions of corroboration centred primarily on solving an immediate clinical problem for which uncertainty existed.

I think we had a patient that was having large aspirates and then the nurses got together and had a discussion about how much we should return to the patient. Should we stop the feeds and um, so going on from that we looked at articles to try and back up, sort of what was the best thing to do and what wasn't. And that also included talking to the consultant as well. Lynn, RN

For Ebony seeking additional information in the face of uncertainty was associated with ensuring safe practice and the need to understand a particular course of action.

If I am not convinced at that then I would go to some other resource. I wouldn't take anything as black and white but it does give you that sort of structured start [using a policy document]. I would look at the guidelines and information given with the equipment and other staff who have used it. And there have been education sessions, so you can actually use it [Continuous Renal Replacement Therapy] and feel quite safe. It is never one thing in isolation.

In relation to accessing information in the literature, Lynn voiced concern over the use of a single piece of information.

So what I generally tend to do is pick out a minimum of say six [journal articles], look at who wrote them, what their background is and where they come from, and will put the article in the context of what everyone else has to say. What I try to do is to get lots of different people's opinions on that subject. So I'm not looking at one person, saying 'Oh my God, you are so fantastic because you have 14 PhDs and something to do with nursing so you must be bright'.

Attempting to corroborate information poses certain challenges, irrespective of whether the information sources are people or print-based material. Niki described the sentiments of other participants that conflicting information from numerous people made it “hard to know exactly what the right thing is to do.”

5.4.3.3 Plausibility

Plausibility was an important characteristic of information for most participants and when information obtained in relation to clinical uncertainty was not sensible, additional sources of information were sought. In seeking information Jordan described receiving information without a rationale and this was not considered acceptable.

I've asked what the routine is and been told 'because it just is'. My reaction...I'd be happy to [provide a rationale for what I do] based on what I've read and how I think it works. Different hospitals do things differently. If they've got a rationale behind that then, OK, fine.

For others a rationale for practice wasn't as important, provided the information came from someone in authority and an attempt to understand the rationale for practice was not evident when Niki commented, "Sometimes there is no rhyme or reason why doctors do what they do. You just do it". This was reiterated by another participant who described a particular intensivist's preference for managing high gastric residual volumes.

One specialist likes to, if we have an aspirate more than 200 mls, to stop the feed or turn the feed right down. Because they may not be absorbing the feeds. They actually [have told me why], that specialist said that it was based on something but I can't remember what he said. I only remember the instructions. Beverley, RN

Interestingly, Beverley later commented that "I just want to do best practice. I need an understanding of why you do things. If I am going to learn how to do something then I want to know the best way to do it and I want to make sure I understand why I am doing something." The uncritical acceptance of information was also evident when Kim was provided information without a clear rationale or evidence-base.

I really can't tell you where that information [refilling feeding bags] came from. I can remember the lecturer [at University] saying that after an amount of time if the feed is sitting there...where the information comes from I really don't know...you believe it [laughing]. It sounded pretty believable.

5.4.3.4 Presentation

Presentation of information was only briefly highlighted by some participants and primarily in relation to people as sources of information. Niki considered the

judgement of an individual's work with "their whole approach to the way they look after a patient" being an important consideration.

Generally most of the time I would look for the most approachable person who I felt has helped me in the past, who is knowledgeable and generally knows their work really well. Kim, RN

For Niki, being approachable was an important consideration and was associated with trusting the individual to not "make me feel like I am stupid". This degree of trust was also highlighted and it was felt that more experienced nurses would be more up to date and provide an honest answer to a clinical query.

I have known that they [more experienced nurses] were more up to date on things or they would be more honest in saying I really don't know... they probably tend to be more honest. Kim, RN

However, it was identified that determining who was best to ask was problematic, particularly for nurses new to the work environment. This suggests that authority, plausibility and presentation may all play an important part in determining a credible source of information, and may be a difficult task for someone who is unfamiliar with the environment and other staff, as highlighted by Jasmin, a senior nurse clinician who wondered, "How do I differentiate, as a beginner, the ones that really know what they are talking about and the ones who don't"?

Information obtained from colleagues was preferred to print or electronic information sources. Critical evaluation of the accuracy of this information was poorly described by participants. Because information was obtained primarily from other people there was a tendency to evaluate the credibility of the individual providing the information rather than the veracity of the information itself and this was most frequently associated with the perceived authority of the individual. The description of other characteristics of information veracity, including independent corroboration, plausibility and presentation, were more limited.

5.4.4 The nature of inquiry

Actively questioning practice and seeking information to inform practice was a characteristic infrequently observed or described in the Think Aloud stage of data collection. The few episodes of inquiry identified were related primarily to information required to solve pressing episodes of clinical uncertainty. Seeking information for broader nursing issues was not evident. However, even when some degree of clinical uncertainty existed there was not a corresponding perception that information to inform practice or resolve the uncertainty may be necessary or useful.

The doctors were the ones that prescribed it [probiotic via enteral feeding tube] so I don't know. To my understanding it was for a bacterial thing, you know. That is something I've never seen here. I couldn't probably go into the clinical reasons...I didn't ask. Niki, RN

However, for some nurses there were episodes of uncertainty that led to further inquiry and discussion which extended beyond the resolution of clinical uncertainty. Those who were more likely to demonstrate a high level of inquiry were characterised by Ebony as being “conscientious” and Beverley described those with an intrinsic drive to want to understand their practice as “... just their nature”. These characteristics were largely attributed to more senior staff although it was noted that less experienced nurses might demonstrate these qualities.

You can sort of say, 'What do you think about this and that' and they will take that on board. They'll come back in a few days and say 'Do you know I was looking that up and I found this and this'. And we will have sort of a chinwag and swap ideas, but this is only some senior people. Jordan, RN

It depends on the individual. I think it really does, actually. You can get some really good junior staff coming through who have actually got a lot more at stake, know it [how to use research], focused on using research because they have done it recently, courses and that. Ebony, RN

The culture of inquiry evident at case site 2 was a clear issue identified by participants in both the Think Aloud and Focus Group stages of data collection. This was perhaps best demonstrated when Beverley suggested that knowing about the different information sources available to support clinical decision making wasn't all that important because "I don't find you need it [more information] out there". While it appeared that other nurses would value more knowledge, particularly if it meant providing better patient care, there was no evidence that nurses were proactive in acquiring this knowledge.

I think there possibly [are] some nurses who just want to do their work. Maybe they are happy with the knowledge that they have. They doubt if any more information is going to help them carry out their work. And they just want to get their work done and go home. Kim, RN

The notion of nurses' work was clearly located within a framework of paid hours of employment and frequent reference was given to a lack of time available in which inquiry could take place. Comments such as "They [the nurses] are interested in their work during work hours" (Kim) and "It is OK if you want to do it [look for information to support your practice] on your day off but.....well, it is not really something that gets done" (Beverly). The concept of work and associated roles was also a consideration and discrete responsibilities were highlighted as a potential reason for nurses not demonstrating inquiring behaviour.

Most of them, no they are not [actively involved in developing work practices], the majority of nurses come to work. They expect the education to happen at work and you are an educator therefore thou shalt organise the education. You're a Clinical Nurse Consultant therefore you shall organise the policies. I'm the floor nurse therefore I shall keep clean the bums. Yes, I'm happy for you to give me the policies but I wouldn't expect you to clean my bum so don't expect me to do your policies. Jasmin, senior nurse clinician

The idea that clinical nurses would be self-motivated and think critically about their practice was discussed by senior nurse clinicians participating in the Focus Group stage of data collection. While there was some disagreement about whether all staff exhibited indifference in relation to clinical inquiry there was general agreement that enthusiasm for inquiry was lacking. Jasmin commented that “The majority of staff you’d be hard pressed to find that enthusiasm” while Norman described trying to get staff motivated was like “pulling teeth”.

The senior nurse clinicians continued to discuss the notion of inquiry in practice at length with various reasons considered as contributing to the level of indifference observed in relation to inquiry. Alyson, discussed issues in terms of work-life balance and considered that time outside of work was “family time” however this wasn’t considered a legitimate excuse by the group because others were able to consider work outside the physical confines of the intensive care unit.

...there’s some fairly good senior staff here and they, why they don’t do [inquiry] at work, I don’t know. But they come to work...to earn a wage and job satisfaction hopefully. They enjoy being nurses but they’re senior experienced people and they have a life outside and they could quite easily go off and do far better or stay [here] and do far better – be more enthusiastic. But they don’t because their priorities are outside work. I don’t know why they don’t, why they’re not more critically inquiring during work hours, I just don’t know. I have a busy life and a thousand other commitments other than my family and my job but I still see that [inquiry about practice] as interesting and exciting. Jasmin, senior nurse clinician

The current approaches to clinical leadership were also posed as a possible reason why inquiry was not actively pursued at case site 2. Jasmin described the important role the medical director could play in developing a culture of inquiry and posited that if “nobody cared at that level then how can you expect anyone else to care?” A perceived deficit in clinical leadership in relation to nursing was attributed to the Clinical Nurse Consultant and the current division of the role

across two hospital sites. Additionally, the changing role of the Nursing Unit Manager was suggested as reasons why clinical nursing leadership may have been deficient. However it was noted that the concept of clinical leadership should extend across all levels of nursing. Examples of clinical leadership were poorly described by participants in the Think Aloud stage of data collection although Jordan described a process of role modelling decision making that was thought by another to be “too convoluted. People just don’t listen to you”.

...if a junior RN comes up to me with a question I try to get them involved in the decision making process, instead of just giving them an answer. I try to give them as many leads to help them come to the decision. Or if I do just give them the decision then I will also try to impart, the why [of how] I came to that decision. Lynn, RN

There was an expectation that those in the Clinical Nurse Specialist role would be engaging critically with practice and providing clinical leadership however concern was expressed that few, if any, contributed to inquiry in this way.

I try to encourage them [Clinical Nurse Specialists] to do [inservices] as well but...it seems to fall on deaf ears. I'd like to see, especially the Clinical Nurse Specialists, doing more inservicing. I think as part of their position they should be doing a bit more. Norman, senior nurse clinician

...every unit has got a handful of Clinical Nurse Specialists so technically speaking that should be a group...if [you're a Clinical Nurse Specialist] then I guess it's an underlying assumption that you [are a leader in terms of evidence-based practice]. Alyson, senior nurse clinician

This type of leadership by more experienced nurses was also an expectation of staff who didn’t express a participatory view to acquiring information or structuring inquiry. Rather there was an expectation that others would be proactive and focus attention on relevant information.

I think it [information] is really hard to get because there is nothing around. Or we don't know about it...no journals. We see journals in here but they [belong to the Nursing Unit Manager]. I think that someone needs to be really proactive and be out there and snap the article up on the wall and say, 'Have a read of this. It is really interesting'. Beverley, RN

5.4.5 Workplace culture and information use

The workplace culture and the impact on decision making and information use at case site 2 was identified by all those who participated in the Think Aloud stage of data collection. Initially vague about the issues surrounding making decisions and using information to influence change, once participants were reassured about anonymity and confidentiality, many participants were forthright in their observations of organisational culture, although they did remain somewhat guarded in what was said. Kim provided extensive detail of concerning issues and then, appearing quite uncomfortable, abruptly terminated the interview, prompting confirmation of the participant's willingness to include interview data. The key issues highlighted by participants were the lack of willingness to embrace change and the fragmented approach to patient care.

The willingness of clinical nurses to embrace change was considered problematic by some although the reasons for this were not clear. It was suggested by Ebony that frequent staffing changes created challenges for a focused approach to managing change. Individual attitudes led to "laziness" and "complacency" and were also impediments to implementing change. On a broader level poor communication between management and staff, as well as between individual nurses, were considered to have had a negative impact.

For other participants the difficulty in making even the smallest change in practice was attributed to the management style within the intensive care unit. In particular the nursing management was seen to have a negative influence over any change that occurred at case site 2. Acceptance of input from the clinical nurses was problematic and in general such input was perceived as not being well received. As Jordan suggested, "You can present the best information but changes

aren't necessarily made simply because they don't want to hear what you are saying". These difficulties were described clearly by Kim:

It [implementing change] is difficult. Very difficult. [emphasised]. I think that you mention a particular thing and it tends to just get swept under the carpet [by other staff]. [They] just think 'What's the point? You're not going to get anywhere with it. I've tried this [to change something] before and it doesn't work'. Staff meetings are just run by the Nursing Unit Manager who does all the talking. The rest of the staff just sit and listen. Because there is no point in saying anything. Nothing changes. Basically I think that people are too scared to say anything. If you are too vocal you just don't fit in and then you have to wear it.

The challenge of implementing even the smallest change was described by Niki who made an attempt to change the way in which infectious wastes were handled at case site 2.

I have said something numerous times and apparently they are getting something [a bin] with a lid. At the moment it is just the yellow bin and you sit next to it at the computer, full of blood and stuff, body fluids, you know. I said something as soon as I came because I just found that...and if it was to tip over, you know, it is an infectious risk. I mentioned it when I first got here [16 months ago]. We even had a ward meeting. It was nurse initiated. I said it once when I started and kept saying it, last about a month ago. It still hasn't changed. I think when you've been doing things for a long time and you're not open to much change then....if you're not, not sort of open to ideas and you're the boss and you want people to know that and you have someone junior asking to change something like that, I think it won't be taken well.

Further difficulties were expressed in terms of patient management because a team approach was not implemented. Failure to implement decisions that were considered nursing-focused was attributed to interference by consultants who often had an inconsistent and fragmented approach to patient care. Theoretically

sensible rationales for patient management were not articulated and Lynn described it as consultants just wanted things done “their own way”. Kim felt that this contributed to a “defeatist culture” because nurses perceived that the work they did to consider best practice and effect change was a waste of time. The lack of a consistent and cohesive approach to patient care was attributed to the absence of an on-site full-time Medical Director of the intensive care unit. This role was considered integral to the provision of clinical leadership at case site 2 although the roles of the Nursing Unit Manager, Clinical Nurse Consultant and Clinical Nurse Educator were not identified as having equal or significant impact in this way.

5.5 Conclusion

In this chapter a description of case site 2 is provided and, in particular, details research infrastructure, the basis for theoretical replication in this study. The intensive care unit at case site 2 did not have a well established research culture. The findings of this study relate to decisions made by registered nurses and the reluctance of some nurses to independently make decisions is identified. The information used to support clinical decision making is described and the preference for personal communication as information identified. Veracity was an important aspect of the information highlighted and accordingly characteristics such as authority, independent corroboration, plausibility and presentation that align with information veracity are described. The nature of inquiry at case site 2 highlighted the lack of inquiry extending beyond task completion. The described impact of workplace culture on the level of inquiry and the use of information to inform clinical decisions was specific to case site 2.

CHAPTER 6

CROSS-CASE SYNTHESIS

6.1 Introduction

This chapter presents a synthesis of the two case studies and provides an analysis of issues emerging across the cases. The strategy used for cross-case synthesis is described. The findings from each case site were merged findings from each case site and form the basis for the development of three key issues identified and reported in this chapter as a synthesis of findings. The three key findings are discussed sequentially according to their overall contribution to understanding the phenomenon of information use in clinical decision making.

First, the notion of natural testimony, or information obtained through personal communication, is discussed from a theoretical perspective, and articulates a view of natural testimony that best fits with clinical nursing practice. Natural testimony, specifically that provided verbally, was privileged by participants in this study over other, more formal, sources of information. Although an important source of information for clinicians, the veracity or accuracy of information obtained through verbal testimony is challenging to assess. Registered nurses in this study largely relied on the personal credibility rather than the veracity of information, and left the information itself unchallenged.

Inquiry by nurses is the second issue highlighted in this chapter. The notion of inquiry can range from acquiring data and procedural information through to seeking of information for the purpose of critical inquiry and furthering of knowledge. In the context of this study inquiry refers to the latter. Key factors that influenced inquiry by nurses included their approach to work, which was impacted by both organisational and personal perspectives. Inquiry was also influenced by models of clinical leadership where an investment in relational capital was seen to positively influence a culture of inquiry. Clinical governance

strategies, while designed to ensure quality and consistency of patient care, were also identified as negatively impacting on inquiry by nurses.

The third issue discussed in this chapter is the usefulness of information to inform clinical decisions and resolve uncertainty in practice. The usefulness of information was influenced by the context of the clinical decision or uncertainty and the media of the information source. While original research was not considered useful, nurses valued research-based practice and responded positively to incorporating research into practice, particularly if research was pre-appraised by colleagues who were able to disseminate research findings to the clinical area and facilitate its use in clinical practice.

6.2 An overview of the cases

An initial review of the literature provided background information relevant to information use in clinical decision making that formed a basis for the selection of clinical areas to serve as case sites for this research. From experience, critical care was recognised as an area of nursing practice where registered nurses frequently made decisions, many of which are non-routine that are based on individual patient requirements and associated with a degree of complexity. Consideration of issues such as the context of practice and variety in the number and type of information sources available to nurses helped to identify case sites likely to be useful in further developing an understanding of information used to resolve uncertainty in critical care nursing practice.

A multiple-case design was selected to provide evidence from more than one case, making the study design robust and the findings more compelling than those obtained from a single case (Herriott and Firestone 1983). Two intensive care units were selected as the case sites; one situated in a major metropolitan teaching hospital (case site 1) and the other in a local district hospital (case site 2). These two case sites were selected to allow for theoretical replication, that is finding differences between sites but for logical reasons (Yin 2003). The case sites were not selected for the purpose of comparison but rather to provide a broader range of

data that would assist with developing a deeper understanding of issues related to information use in clinical decision making within contextually different settings.

The two case sites shared some common characteristics and differed in others. First, both case sites were intensive care units where nursing care was provided solely by registered nurses. Both intensive care units employed a Clinical Nurse Consultant and Clinical Nurse Educator(s). While the Clinical Nurse Consultant at case site 2 had responsibilities across two hospitals, overall this site had fewer full-time equivalent staff and a lower number of annual admissions. Both intensive care units had the ability to provide care for critically ill patients although case site 2 also admitted cardiology patients and therefore had a broader range of acuity, including more patients with single organ failure. Twenty-four hour medical support was available at both sites.

The level of research activity across the two sites differed considerably. Where case site 1 had a high level of nursing and medical research activity, the research involvement at case site 2 was limited to screening and enrolment of potential participants for studies originating from other intensive care units. Case site 1 also had a full-time Professor of Critical Care Nursing located on the same floor as the intensive care unit.

Differences in the approach to staff education were also apparent. Case site 1 had a well developed and active education program with daily in-services and a formal introductory program for nurses new to intensive care. In contrast case site 2 provided education on an ad hoc basis. Information technology provision was more limited at case site 2 where there was only one computer available in the nine-bed intensive care unit. Case site 1 had six computers available in the intensive care unit which equated to one computer for every three beds.

6.3 Cross-case synthesis

Merged findings were identified following a procedure for cross-case synthesis as outlined in Chapter 3 (p. 52). Initially data from each case site were individually analysed and case-specific findings were identified. For each case

site case specific findings were able to be categorised under the themes of making decisions, information sources used to support clinical decisions, the veracity of information and the nature of inquiry. At case site 2 an additional finding of workplace culture and information use was identified.

Before cross-case analysis could be undertaken key findings from each case site were written as statements. These statements were then analysed and those that were similar were grouped together and identified as a merged finding. Three merged findings were identified through this process. The first merged finding pertained to natural testimony, specifically information obtained from others as natural testimony, the preferred use of verbal testimony, and evaluation of verbal testimony which encompassed both source credibility and the veracity of information obtained through verbal testimony. The second merged finding related to inquiry in nursing practice, in particular nurses' approach to work, inquiry in the workplace, clinical leadership and clinical governance. Usefulness of information was identified as the third merged finding. Statements pertaining to each merged finding are listed in Appendix 8 and grouped by case site to illustrate each case site's contribution to the merged theme.

6.4 Natural testimony

Natural testimony, or information obtained from other people, was preferred as a source of information to support clinical decisions. In this section the use of information obtained from others is discussed in relation to the literature pertaining to the epistemology of testimony. The preferential use of natural testimony, specifically verbal testimony, is discussed in the context of the limited body of literature that identifies people as a source of information or knowledge for nursing practice and is followed by a critique of how the veracity of such information is determined.

6.4.1 Information from others as natural testimony

The most prominent issue identified in this study was the use of other people, colleagues in particular, as sources of information to support or inform clinical

decisions. The acquisition of information from the spoken or written word of others has been described as 'natural testimony' (Lackey 2006b, p. 178) and therefore differs from the formal testimony offered under oath in a courtroom. For the purpose of this discussion the term verbal testimony will be used to reflect natural testimony provided verbally as a source of information to support clinical decision making.

There are subtle differences in how natural testimony is defined. The work of C.A.J. Coady was influential in framing discussions of natural testimony (Coady 1992). Coady's explanation of natural testimony stipulates that a person is testifying when they make a statement relevant to a dispute or unresolved question where the information is directed to those who are in need of the information. The statement would only be considered testimony if, and only if, the person states that the information provided is *evidence* and where the information is offered as *evidence*. There is an additional requirement that the person providing the information must have the relevant competency, authority or credentials to make the statement.

Initially, Coady's description of natural testimony appears to work well and, in particular, the inclusion of criteria against which to assess the speaker is useful in evaluating the information offered, an important consideration when information is needed to inform clinical decisions around patient care. However, the full description of natural testimony offered by Coady is not as applicable to the observed exchange of information between nurses in the clinical setting. First, the premise that the speaker offers evidence is problematic. This implies that testimony can only refer to correct information and suggests that it is impossible to have an unreliable testifier. This does not fit with the experience of clinical nurses who, as Niki suggested (p. 128), have experienced variability in the quality of information provided by different nurses. Clearly, nurses who provide less than adequate information are still testifying, it is just that the information they provide is less robust and may not qualify as evidence. It is possible for the speaker to provide incorrect information and for this to be accepted as testimony by the recipient.

It is also problematic to assume that testimony can only exist when the speaker intentionally offers their words as testimony. Within a clinical environment where nurses and other clinicians work in close proximity it is likely that conversation overheard could subsequently be used as testimony even though it is not offered as such. For this reason Coady's narrow view of testimony is unworkable for clinical practice (Coady 1992). For example, a nurse could overhear a discussion about assessment of feeding tolerance and draw the conclusion that aspiration of 500 mLs of gastric secretions on two successive occasions is suggestive of feeding intolerance. This could (and arguably should) be taken as an instance of testimony and information the nurse could use to support a clinical decision despite the fact that the testimony was directed to someone else. Thus maintaining a speaker's intention to testify as a requirement for identifying instances of natural testimony in the clinical setting would result in important information useful for making clinical decisions being discounted.

Coady's (1992) account of testimony is therefore far too limiting to be useful when considering information exchanged in the clinical setting. Others (Audi 1997, Fricker 1995) have considered a more broad view of natural testimony which suggests any expression of thought can be considered testimony.

This account of natural testimony overcomes some of the limitations evident in Coady's description however this broad view of testimony is equally problematic because it does not fit with the notion of conveying information to another person. This perspective of testimony would also include statements such as 'This is a very busy shift' which is a non-informational expression of thought not intended to convey or required as information. In the context of clinical practice if we consider testimony from this broader perspective we would then be required to accept any expression of thought as testimony including conversation fillers, polite responses, or utterances of frustration.

Excluding expressions not intended or required as information and subjectively stating conditions of testimony provides a middle road for a definition of natural testimony (Graham 1997). In doing so the statement offered

is not required to be potential evidence and the speaker' is not required to have the stated credentials rather that the speaker intends the receiver to *believe* the speaker has the relevant credentials. Thus Graham's account of natural testimony avoids some of the problems presented in other accounts but still precludes information as testimony unless it is the speaker's intention that it be intended as such (Graham 1997). Having speaker intent as a requirement of testimony would rule out many instances of testimony that undoubtedly have been useful sources of information for many nurses and consequently this moderate view of testimony has limited usefulness in the context of clinical nursing.

Conveying information in the context of nursing practice clearly has a strong and sustained oral tradition. The accounts of natural testimony described thus far recognise the importance of conveying information through statements, either verbally or in writing. Some clinical questions posed to nurses are easily addressed verbally. Others, however, are much more difficult to articulate. For example, if one nurse asked another how to remove excess enteral feeding solution from the drip chamber, this indeed would be challenging to accurately describe. What is needed to help with the clinical query described above is what Brand (1984) termed procedural knowledge for which the answer is much easier to demonstrate.

The discourse around the epistemology of testimony is evolving. Jennifer Lackey, in a comprehensive critique of existing philosophical views of testimony (Lackey 2006b), proposed an alternate view of testimony that captures aspects existing views of testimony proposed by Coady (1992), Audi (1997), Fricker (Fricker 1995) and Graham (1997). Lackey's account of natural testimony appears to fit best with the conveying and accepting information for clinical practice described by participants in this study. While previous descriptions of testimony refer to the providing evidence, Lackey (2006b) instead refers to the conveying of information. This conveying of information is a more appropriate description of what occurs when a nurse approaches a colleague for information to support clinical decision making. She also goes further in her description of testimony and details two perspectives of testimony: that of the speaker and that

of the hearer. Speaker testimony allows for intentional conveying of information while hearer testimony 'can serve as a source of belief or knowledge for others, regardless of the testifier's intention to be such an epistemic source' (Lackey 2006b, p. 189)

6.4.2 The preferential use of verbal testimony

The epistemology of testimony is important because much of the knowledge and information nurses have for clinical practice comes from others rather than from individual observation. In most instances, except for the direct observation of a patient, nurses come to know something because someone else said it was so. The development of knowledge through the testimony of others can occur through both written and verbal means although in the context of clinical practice, most information comes in the form of verbal testimony.

The preferential position of the use of verbal testimony as information was supported by the fact that no participant was observed using other forms of information during the Think Aloud stage of data collection (Stage 1). Every nurse indicated a preference for using other people as sources of information. This preference is not surprising given the close working relationships of nurses which promotes interaction and discussion thus contributing to a pervasive oral culture (Flaming 2003). The preferential use of verbal testimony as a source of information is consistent with other work examining information use within the context of clinical practice within nursing (Estabrooks et al. 2005b), and in other health disciplines (Bryant 2000, Dee 1993, Gravois et al. 1995, Hall 1995). In the study reported here the only situation where written information was preferred to that obtained from another person was when pharmacological information was required. This preference for written information in relation to medication administration has also been described by McCaughan et al. (2005) and is understandable given the highly specific and precise nature of information required as well as legislative issues pertaining to medication administration.

The preference for using people as sources of information seems enduring and has changed little in the past 30 years (Blythe and Royle 1993, Crawford and

Haaland 1972, Weinberg et al. 1981). It might be that the immediate and context-specific nature of information required for clinical practice is more aptly accommodated when information is obtained through a process of social interaction. The accessibility of people within the clinical area and their ability to adapt or refine information may present fewer obstacles and allow for a more immediate resolution of uncertainty.

Nevertheless, text and electronic-based information, including institutional policies and procedures, were considered definitive information sources. It was suggested that practice consistent with institutional policies and procedures provided security in decision making. The preference for people as an information source and the valuing of institutional policies initially presents a conflict when the quality of decisions is considered. However, it is likely that nurses believed information provided by others reflected institutional policies and procedures and they were accessing institutional-based information by proxy as is reflected in a comment by Niki who stated “There aren’t many times that I have had to go and get a policy because there are usually people there that know how to do it”.

In the context of critical care nursing practice there is a need for accurate and timely decisions and where information required to resolve clinical uncertainty needs to be readily accessible and applied quickly to clinical practice. A constant reference to time, or the lack thereof, in which information could be sought, was a major explanation for why textual and electronic sources of information were not more frequently accessed. However, how nurses conceptualised time was not clear, particularly as it related to information access. There were clearly many instances in which provision of direct patient care required rapid access to accurate and trustworthy information. Although clinical nurses declared that they did not have time for information seeking they were able to accommodate activities not directly related to nursing practice or patient care.

It has been suggested that lack of time for research use may actually be a proxy for lack of approval by colleagues and/or lack of personal interest (Tyden 1996). In this study of Environmental Health Inspectors time was initially

identified as a barrier to research use however the importance of time diminished as participants were questioned further and a stronger focus on personal interest, support by colleagues and being acknowledged became more important features of research use (Tyden 1996).

Time can also be linked to concepts of busyness, which is an expectation of nurses themselves and their employers. It has been suggested that nurses use busyness as a strategy to protect themselves from emotional involvement or unpleasant experiences (Martin 1998), or from the demands of patients and families (Wilson et al. 2005). Research utilisation may be an example of an unfamiliar nursing activity from which nurses shield themselves and where preference for familiar nursing tasks takes precedence over the unfamiliarity of research utilisation (Thompson et al. 2008).

The concept of time was not explicitly explored during data collection for this thesis. Consequently, while many nurses made reference to the lack of time for locating information, particularly research, more detailed data were unavailable to help elucidate this important concept. The discrepancy between stated lack of time and observed use of time available highlighted an interesting area for further study.

Trust and confidence in the information obtained through verbal testimony was another important reason nurses relied on colleagues when information was needed to help inform clinical decisions and was a feature across both case sites. Confidence in using information from a colleague may result in a validation of feelings and actions has been described as describe as 'affirmational support' (Estabrooks et al. 2005b, p. 464). To some degree discussing an issue of clinical uncertainty with a colleague may also be perceived as a sharing of the responsibility and perhaps accountability for the decision. Construction of the health care team also suggests that nurses work in concert with nursing colleagues and other health professionals and may reinforce the notion of team or team decision making. Conversely, some nurses may be reluctant to seek information from others. They may perceive information seeking as highlighting deficits in

personal knowledge, even if they are legitimate, which may then leave them open to criticism and future scrutiny.

Using others as a source of information is well described in the nursing literature and was reflected in this study's data. The continued reliance on verbal testimony is also curious given the concerted move toward evidence-based practice over the last 15 years (Cullum et al. 2008). The conceptualisation that the individual nurse has a responsibility for delivering patient care based on the best available evidence is highlighted by the National Health and Medical Research Council through the National Institute of Clinical Studies (NICS) (<http://www.nhmrc.gov.au/nics/asp/index.asp>). Established by the Australian Government in 2000, the aim of NICS is to help close the gap between the best available evidence and current clinical practice. Similarly the Australian Nursing and Midwifery Council (ANMC) (2005) Competency Standards for the Registered Nurse stipulate that registered nurses in Australia practice within an evidence-based framework. At a specialty level critical care nurses are also expected to use research to inform their practice (Australian College of Critical Care Nurses 2002). There is ample evidence from this study and the work of others (Estabrooks et al. 2005b, Thompson et al. 2001b) to suggest that the use of original research to inform clinical decisions is not common amongst registered nurses. However this does not necessarily mean that nursing practice is not research- (or evidence-) based. It is quite possible that information obtained from colleagues may have a research base. Profetto-McGrath et al.'s (2007) work with Clinical Nurse Specialists illustrated how nurses in such clinical leadership roles may be effective conduits of evidence-based practice. Seeking information from others may be a way of getting evidence to the bedside although at present the extent to which information sought from and provided by others is research-based is unclear.

It has been argued by some that the evidence-based practice impetus may be to the detriment of other important sources of practice knowledge for nurses (Holmes et al. 2006, O'Brien and Pearson 1993). O'Brien and Pearson (1993) argue that the exchange of oral information is a legitimate approach to

communicating information and nursing knowledge, and point out the limitations of written information particularly when procedural information is required. Similar reliance on verbal testimony has been reported in studies conducted in other health care disciplines including physiotherapy (Hall 1995), dentistry (Gravois et al. 1995), and medicine (Dee 1993, Thompson 1997). Most of these studies are descriptive in nature and provide little detail or discussion of factors that guide the selection of particular information sources.

The value of verbal information is clear, however Estabrooks (2005b) warns against indiscriminate trust of aesthetic information, such as information obtained from colleagues, because of its potential to introduce bias into decision making. The use of verbal testimony as information in clinical decision is further compounded by the challenges of determining if information obtained from others is valid, reliable or accurate (Thompson 2001) and highlights the need for nurses to think critically about not only the source of information but the information itself.

6.4.3 Evaluating verbal testimony

There is a general expectation that the information used to inform clinical practice should be reliable, valid and accurate. There is much written on the assessment of written information including how to critique research (Cullum et al. 2008) and how to evaluate websites (Bruce 2000). It is much more difficult to clearly articulate how we justify accepting the testimony of others. Estabrooks et al. (2005b) describe the difficulty experienced in trying to assess the quality of knowledge that is 'embedded in practice and not explicitly available for discourse and scrutiny' (p. 472), which is the case with verbal testimony. Participants in this study appeared to evaluate information primarily based on source credibility and infrequently considered the veracity of the information itself.

6.4.3.1 Source credibility

In clinical practice, determining the accuracy of a colleague's testimony can be problematic because nurses are often seeking information in the context of clinical uncertainty so it stands to reason that they may not be adequately

equipped to fully consider the reliability, validity and accuracy of information given. The lack of knowledge necessary to evaluate the information, together with the human tendency to assume what others say is given faithfully and can generally be relied upon (Reid 1997), means that uncritical acceptance of information offered by others is likely. Burge's acceptance principle contends that 'A person is entitled to accept as true something that is presented as true and that is intelligible to him, unless there are stronger reasons not to do so' (Burge 1998, p. 467) and suggests that belief in information from others negates a need to think critically about information provided. The inability to critically evaluate information means that nurses may rely on establishing source credibility as a proxy strategy through which to evaluate information quality. In the case of verbal testimony as information, the focus is on establishing the credibility of an individual, of which expertise and trustworthiness were components (McGinnies and Ward 1980).

Expertise was an important factor in establishing credibility and was often linked to experience and knowledge in critical care practice. Individuals who held positions associated with a greater level of experience and knowledge were consistently identified as useful sources of information suggesting that nurses found these individuals to be credible. For example, at both sites the Clinical Nurse Educator(s), Clinical Nurse Specialists and Clinical Nurse Consultant were among the most useful sources of information identified. However, the value clinicians place on experience versus knowledge is not clear. Previous work suggests that experience rather than research-based knowledge is more strongly valued (Luker and Kenrick 1995, Luker et al. 1998). However experience itself is not automatically suggestive of an individual's expertise. As Niki commented "...even senior people that you ask, some you can sort of, you know that they know what they are talking about and others you think, I'm really not too sure". Niki's comment suggests that experience is only one component to determining who to approach for information and that perhaps experience plays a much smaller role in establishing a nurse's credibility. Thompson et al. (2001c) suggest that a combination of experience and perceived research awareness contributed to the credibility of information obtained from colleagues but ultimately the

determination of credibility was still associated with a trust born of personal assessment of an individual's clinical rather than research skills (Thompson et al. 2001a).

As suggested by McGinnies and Ward (1980) trustworthiness of an individual appears to be much more important than expertise or perhaps even knowledge. Trust of the person providing information was highlighted by nurses at both case sites but was not always directly linked with expertise or experience. Nurses did not clearly articulate criteria that they used to judge the trustworthiness of another nurse but suggested that personal characteristics such as approachability and the knowledge that, as David articulated "they aren't going to belittle you" suggested that a nurse's personality may be an important influence on whether they are sought as a source of information. Participants also indicated that over time they were able to determine which colleagues would provide more credible information. This may perhaps be related to previous success in obtaining and using information from particular nurses which may further establish a sense of trustworthiness in that individual, resulting in a more frequent reliance on a particular nurse as an information provider. However, the time taken to discern trustworthy and expert sources of information in the clinical setting can be problematic. This may be an important issue for new staff and agency nurses who do not have the requisite time to establish relationships and determine credible sources. The lack of existing strategies to identify credible information sources impacted those at case site 1 and prompted Alyson, a senior nurse clinician, to suggest that those new to the intensive care unit should be "warned" of who not to approach for information. In this example is not clear what nurses were being "warned" against and there are a multitude of possible factors that might constitute reasonable grounds for why some nurses should not be actively sought for information. These may include knowledge deficiencies, substandard practice, poor attitudes and/or a disagreeable personality, all of which can, and should, be addressed through performance management strategies.

Credibility appeared to have a particular contextual significance to registered nurses in this study. While factors associated with credibility, such as knowledge,

expertise and trustworthiness were described as important there was also a need for perceived clinical currency of individuals before they could be considered as useful sources of information. Those nurses who had many years of previous clinical experience, vast knowledge and were experts in the area of critical care nursing were not considered useful sources of information because their work focused on research rather than direct patient care. As Robert commented, “I know that [the research nurse] was a nurse at one stage but, um, I just don’t see them as a clinical resource. I see them as someone who is doing research in that job. Not [someone] that I would access”. The literature is somewhat limited in research addressing the issue of clinical credibility and most work has been done in the context of nurse teachers/academics (Fawcett and McQueen 1994, Goorapah 1997). If registered nurses are seeking information from clinically credible sources then determining characteristics of these individuals may be an important area for further research.

6.4.3.2 Veracity of information obtained through verbal testimony

The veracity of all information used to support clinical decisions is important but is particularly difficult to establish when verbal testimony is used singularly. Determining the veracity (accuracy or truth) of information has been extensively discussed in relation to the evaluation of research in clinical practice. The evidence-based practice movement has resulted in extensive resources and guides to assist clinicians critically appraise literature, research in particular. However, at present similar criteria are not available for evaluating information obtained through verbal testimony. This is concerning because, however unintentional it might be, the potential for inaccurate information to be provided exists (Faulkner 2000). In clinical practice, the heavy reliance by nurses on verbal testimony suggests that the veracity of information obtained in this fashion should be considered. At present there are few if any resources suggesting strategies for evaluating information obtained verbally.

Authority, independent corroboration, plausibility and presentation, are the characteristics suggested by David Hume as important in establishing information veracity (Hume 2004 [originally published 1742]), and which were used as an

analysis framework in this study (Fallis 2004). The characteristic that featured most prominently was that of authority, with the perceived authority associated with the attributes of the person testifying. Most participants also identified independent corroboration as an important aspect of assessing the veracity of information. The concept of corroboration proposed by Hume (2004 [originally published 1742]) described a strategy whereby additional information was obtained in order to help establish the accuracy of the original information. Corroboration seemed to be required more when nurses did not know the person providing the information. Whether information was provided verbally or as text, a level of trust in the individual providing the information was apparent. When verbal testimony was used as information, nurses were unlikely to use corroboration as a strategy to assess information accuracy. Accepting information from a colleague without corroboration may occur because the nurse trusted their colleague to provide them with a faithful account. With text there was a similar uncritical acceptance of information. Both David and John were happy to accept information published in a reputable journal as being accurate because they had trust in the particular publication. However, if the author or publication was not familiar then there was a greater propensity to attempt corroboration as suggested by Patricia who stated "...you may have to compare a few different, well chosen papers to get a pretty well rounded and reliable perspective".

The level of trust a nurse had for the information source also impacted on the assessment of information plausibility which was infrequently described as a characteristic used to establish the veracity of information. As Hannah commented "I admit that I have been guilty of just having gone with what that person has said, because of their level of experience. I didn't question her, how she got that information or anything. I took her word for it." This approach to information appraisal was not uncommon and presents an interesting dilemma if nurses purport to use reliable, valid and accurate information in developing practices based on evidence. Faulkner (2002) describes the influence that pre-existing beliefs have on establishing the credibility of information and certainly if information obtained from another nurse didn't correspond with pre-existing beliefs then it is unlikely that the information would help resolve the episode of

clinical uncertainty. To the contrary, it may well confound the uncertainty. Perhaps nurses do not consciously assess the plausibility of verbal testimony, only questioning the information accuracy when it contradicts existing beliefs.

This approach to assessing the plausibility of information does not represent a proactive approach to using the best available information to inform clinical decisions. Criteria for assessing the accuracy of verbal testimony have been suggested that involve a conscious effort on behalf of the nurse acquiring the information to consider the veracity of information (Lackey 2006a). The *Statement View of Testimony* as described by Lackey is where the 'speaker offers a statement to the hearer along with the epistemic properties it possesses, and a hearer forms the corresponding belief on the basis of understanding and accepting the statement in question' (Lackey 2006a, p.93). This approach suggests that nurses, before accepting a colleague's statement as being true and accurate, need to consciously consider whether the speaker is indeed a competent testifier and if there is further information available which might render the statement suspect. The latter requires a degree of critical thought on the part of the nurse receiving the information rather than immediate (but often expedient) acceptance of the statement's accuracy.

While applying critical thought to the veracity of verbal testimony is warranted and should be encouraged, the application of this strategy in clinical practice may be difficult. First, nurses seek information from others when they are faced with clinical uncertainty suggesting that they did not themselves possess the requisite knowledge or experience to make an informed clinical decision. If this is the case, then it is questionable whether they are in a position to critically evaluate the information provided by another. Of course, additional sources of information could be sought to corroborate or to establish the plausibility of the information but there may not be the time, resources or willingness to do so. As John Hardwig (1985) commented,

‘...though I can readily imagine what I would have to do to obtain evidence that would support any one of my beliefs, I cannot imagine being

able to do this for all of my beliefs. I believe too much; there is too much relevant evidence (much of it available only after extensive, specialized training); intellect is too small and life too short.’ (p. 335).

The obvious question is to what extent nurses in clinical practice should go to establish the credibility of information used to inform clinical decisions.

6.5 Inquiry in nursing practice

In this case study, nurses were more likely to seek information to resolve clinical uncertainty but did not seek information that pertained more broadly to nursing practice. The information required for daily work was therefore associated with necessity and immediate need, and as identified by Spath and Buttlar (1996) may be qualitatively different information from that required to stay current in critical care nursing which may provide at least a partial explanation for the predominant use of colleagues as sources of information. The presence of clinical uncertainty also does not appear to stimulate the need for a deeper level of inquiry (particularly if the immediate issue is resolved). In fact data demonstrated a general ambivalence towards seeking information for the purpose of knowledge development either personally or in shared development with colleagues. A broad theme of inquiry in nursing practice was identified during cross-case synthesis and within this theme key issues were identified including the approach to work, inquiry in the workplace, clinical leadership and clinical governance and are explored as possible explanations for why a culture of inquiry was not observed in this study.

6.5.1 Approach to work

An individual’s approach to work is naturally greatly influenced by individual values and the organisational culture in which they work. For many nurses work is confined to paid hours of employment and the expectation for nurses to do work in their own time is considered preposterous. In this case study, although nurses considered information seeking and inquiry to be part of work it was also considered that this task must be carried out during work hours. However,

difficulty in conducting inquiry during work hours was complicated by the nurse's perceived lack of time, poor access to resources and deficit in knowledge and skill related to information seeking and critical inquiry, findings which are similar to those described by Estabrooks et al. (2005b). Organisational and personal perspectives that questioned nurses need for this type of inquiry were also evident. If inquiry cannot be (or is not) done during work hours, then it stands to reason that it must be done during personal time. An organisational expectation that nurses undertake inquiry in their own time was not explicitly stated at either case site but has been described elsewhere (Scott-Findlay and Golden-Biddle 2005) and may be what Schien (2004) terms an assumption; that it is, 'the deepest level of core of culture that provide expectations that influence perceptions, thoughts, and feelings about the organisation' (Scott-Findlay and Golden-Biddle 2005, p.360). While not explicitly stated by any participants it became apparent that individual constructions of work may have situated the nurse either to view their work in ways that are more consistent with those of trade work (that is they were paid for the hours worked and there is little "carry forward" of daily responsibilities or accountabilities), than as a profession, where the time-defined boundaries of work are less clear, and expectations of continued professional development and personal accountability more clearly defined. Individual constructions of work may have a significant impact on inquiry by nurses and warrants further investigation.

Practical factors may not completely explain the lack of an inquiring culture observed at both case sites. The current construction of organisational culture is well described as 'a socially constructed phenomenon, expressed in the patterns of behaviours (including physical, cognitive and affective behaviours) of its practitioners (Scott-Findlay and Golden-Biddle 2005, p. 360). Organisational cultures have been described as being either describe organisational cultures as being either oriented towards *doing* or towards *being* and argue that nursing has a stronger preference for *doing* where time at work is seen as being for getting things done and where the physical and observable aspects of nursing are highly valued (Scott-Findlay and Golden-Biddle 2005). While the organisational culture may be directed towards *doing*, at case site 1 at least, some senior nurse clinicians

were trying to create a shift in thinking where there was an emphasis on developing a level of critical inquiry within the context of patient care. The notion that nurses, whose primary responsibility was for clinical care, could (or should) conduct this level of inquiry was passionately debated amongst the senior nurse clinicians during the focus group discussions at case site 1. At case site 2 role delineation suggesting that clinical nurses' work did not include inquiry was evident when Jasmin commented "You are the educator therefore thou shalt organise the education. You are the CNC therefore you shall organise the policies. I'm the floor nurse therefore you shall keep clean the bums". Consistent with the lack of inquiry observed at either case site, Profetto-McGrath et al. (2007), in a study of Clinical Nurse Specialist's use of evidence in practice, also described 'a culture that does not encourage nurses to ask questions' (p.91). Attitudes towards the academic development of clinical nurses was not fully explored in this research and highlights an important area for further study for if, within the workplace, the concept of 'work' continues to focus on *doing* and does not include inquiry then achieving a culture of critical thought and inquiry will continue to be problematic.

6.5.2 Inquiry in the workplace

Registered nurses are expected to deliver care that is consistent with best practice, implying a requirement to maintain current knowledge of their practice. In order for nurses to fulfil this requirement of current, practice-related knowledge a degree of inquiry is required. However, for most registered nurses, undertaking inquiry of this nature within the workplace is difficult. Nevertheless, there is an organisational expectation that nurses undertake inquiry during their own time which creates a dilemma, sending a message that the organisation does not value inquiry as much as *doing* work while setting an expectation that many nurses clearly do not or cannot fulfil. The need to maintain the cultural norms of the workplace was also described by Estabrooks et al. (2005b) and suggests that if nurses follow established practice or unit routines there is no need for inquiry. In relation to enteral feeding practice at case site 1 inquiry did not appear to be necessary because nurses relied on an enteral feeding protocol to guide practice

and did not view themselves as having responsibility for decision making in this area. In contrast at case site 2 where there was no protocol, nurses were more inclined to make independent decisions about enteral feeding practice and accepted that greater practice variability would result. The increase in independent decision making did not appear to be linked to a greater level of inquiry and most nurses based their decisions on ritual or previous experience. Inquiry was not considered necessary and an acceptance of the status quo was evident in the comment by Beverley who said, “I don’t find you need [more information] out there”.

Inquiry may also be influenced by the degree to which nurses feel they have control or influence over nursing practice (Attree 2005). At case site 1 most of the nursing practice related to enteral feeding of the critically ill was stipulated by existing policies or clinical practice guidelines. For specific issues not covered by these guidelines nurses predominantly referred the matter to a doctor. At case site 2 nurses indicated that they had some freedom in clinical decision making when it came to administration of enteral feeding solutions but different levels of independent decision making were sanctioned by doctors, some encouraging nurses more than others. At case site 2 there were several factors that negatively influenced nurses’ attitude toward inquiry. Inquiry and the development of knowledge are logically linked to change in clinical practice and it is here that nurses at case site 2 experienced the greatest challenge. Many nurses developed what Kim called a “defeatist culture” because suggestions of change were not positively received. Jordan suggested that those with a position of authority in the unit “don’t want to hear what you are saying”. Disregard for clinical nurses’ suggestions was a source of frustration and as Kim commented, nurses were often silent because “... people are too scared to say anything. If you are too vocal you just don’t fit in and then you have to wear it”. This comment suggests that repercussions for initiating change were significantly more threatening. The repercussions (real or perceived) for challenging the status quo were such that all nurses participating in the think aloud stage of data collection (stage 1) discussed, although somewhat guardedly, the personal implications associated with not

conforming to existing practice or for suggesting an alternate approach to patient care.

The inability to make independent decisions, whether the result of clinical governance strategies such as protocols or because workplace culture did not encourage inquiry or independent practice, is associated with more bureaucratic practice environments. As described by Lake and Friese (2006), the bureaucratic practice environment is characterised by centralised decision making and hierarchical relationships between nurses and doctors. At case site 1, centralised decision making was exemplified in the heavy reliance on protocols. Further, the protocols themselves, while developed by nurses for nursing practice, received final approval from the Director of the intensive care unit (a physician) highlighting existing hierarchical structures in this intensive care unit. At case site 2, the lack of protocols enteral feeding management was not as clearly prescribed, but the degree of independence was influenced by the doctors, who, as a group, did not have a consistent viewpoint regarding the scope in which nurses could make independent decisions. Case site 2 was also characterised by clear hierarchical structures within nursing where management strategies stifled any decision making or inquiry that challenged the status quo.

The characteristics of those in leadership positions described by the nurses at case site 2 clearly do little to promote a culture of inquiry. In her paper on resonant leadership Cummings (2004), describes the importance of those in leadership positions listening and responding to staff concerns. Additionally, the importance of providing resources, removing barriers and promoting professional autonomy were highlighted as strategies that were important in ultimately providing better patient care. Clearly, clinical nurses at case site 2 experienced significant challenges in developing and sustaining a culture of inquiry that may contribute to improvements in patient care and outcomes.

6.5.3 Clinical leadership

Within this case study clinical leadership is identified as having an important role in developing a culture of critical inquiry. At case site 2, the Medical Director had

been appointed five years earlier. This change in medical staff was perceived by Jasmin to have resulted in a decline in the culture of inquiry among the nurses, even though senior nursing positions remained stable and clinical leadership was enhanced with the appointment of a Clinical Nurse Consultant. This suggests that the model of nursing leadership was such that the responsibilities for nursing leadership were not clearly delineated. The onus for clinical leadership was placed squarely on the shoulders of the doctors in the unit as evidenced by Jasmin's comment that "if nobody cared at that level then how can you expect anyone else to care?"

In contrast senior nurse clinicians at case site 1 described clearly how clinical leadership could be used to role-model critical dialogue and inquiry. The success of this strategy depended very much on individual nurses and while critical dialogue was encouraged by senior clinical nurses, nurses working directly in patient care did not identify critical dialogue or inquiry as occurring in the clinical setting. This might be because, as some senior clinical nurses suggested, that skills for participating in critical dialogue may be lacking or that individual nurses may be unwilling to open themselves and their thoughts to scrutiny. Senior clinical nurses at case site 1 believed they were able to role-model this type of critical dialogue although recognised that a more consistent and widespread demonstration would be required before a culture of critical dialogue could become established among clinical nurses at this site.

To establish a culture of critical dialogue, investment in developing the requisite knowledge, skills and attributes of individual nurses would be required. Establishment of a cohort of nurses with the ability to role-model critical dialogue, decision making and information use would encourage what Gopee (2002) described as 'relational capital' where colleagues invest in each other through providing time, patience and teaching. Such a strategy may positively influence perceptions of leadership and workplace culture both of which have been associated with a significant increase in research utilisation (Cummings et al. 2007). However, establishment of a culture that embraces critical dialogue and inquiry would require an investment in both the development of staff and material

resources to support the cultural shift. Consequently, leadership to affect this type of change within the practice environment needs to be demonstrated by administrators, clinical leaders as well as nurses providing direct clinical care so that the organisation and those working in it are ready to accept change (Newhouse 2007).

While the support of clinical leaders, such as nurse managers, educators and consultants, is important in fostering change within the intensive care unit, leadership by nurses working directly in patient care is also important and is perhaps what the senior nurse clinicians at case site 1 were referring to when identifying the importance of role-modelling decision making practices. Jackson (2008) describes this type of leadership (servant leadership), that is not associated with legitimate authority or positional power and can be present at any level within an organisation (Stone et al. 2004). This approach to clinical leadership is important in the development of an inquiring nursing practice that uses information effectively when making clinical decisions.

6.5.4 Clinical governance

Clinical governance refers to the systems and strategies initiated to promote accountability, and have been introduced into health care settings as a means of improving patient safety and the quality of care (NSW Department of Health 2005b). The clinical governance framework under which the nurses in this study worked 'integrates clinical decision making in a management and organisational framework and requires clinicians and administrators to take joint responsibility for the quality of clinical care delivered by the organisation' (NSW Department of Health 2005b, p.4). This suggests a cooperative approach to developing strategies for patient care yet, with the exception of senior nurse clinicians, many nurses had not been involved with or could even describe the process through which organisational documents were developed. Organisational documents, although aimed at improvements and consistency with patient care, have the potential to negatively impact nurses' inquiry in clinical practice. Such documents are often viewed as being definitive and failure to follow recommendations in

organisational documents may even be associated with a degree of professional risk. This raises the question as to whether inquiry or information seeking is worthwhile as Reid suggested, “the policy is always going to override [anything else].”

At both case sites there was a commonly held belief that the purpose of organisational documents is to guide clinical practice and promote quality in health care provision and consistency in practice. There was also a general assumption that policies reflected best practice although most nurses indicated that it was difficult to tell whether this was actually the case. As Robert suggested some policies could not be relied upon because “they get outdated fairly quickly....there are obviously some that are outdated”. Despite an inability to assess the quality of organisational documents nurses continued to rely on these to inform their clinical practice. They expressed a sense of assurance in making clinical decisions because, as Bryan described, following organisational documents meant they “weren’t practicing outside the boundaries of what was expected in that unit and exposing themselves to a performance management issue.” The need to so closely follow organisational policies and procedures is at odds with an expectation that nurses exhibit an ability to use the best available evidence to support their practice and suggests that a level of independence in decision making and clinical practice, often considered a characteristic of professional nursing (Tranmer 2005), did not exist. While nurses perspectives of the degree to which they could practice independently were not directly investigated in this study, the reluctance of participants to make independent decisions, low levels of inquiry and a dependence on information obtained from others suggests that nurses may have had little support for making independent decisions. This is not surprising as the literature suggests that, despite autonomous practice being encouraged and highly valued, only moderate levels of autonomy are reported by most nurses (Kramer et al. 2006). The impact of policies and guidelines on clinical practice has been scrutinised for its impact on independent decision making and in the field of medicine is hotly debated and referred to by some as cookbook medicine or ‘medicine by numbers’ (Genuis 2005).

There are undoubtedly many positive reasons for organisational documents such as policies and clinical practice guidelines. For example, Safer Systems Saving Lives is a system of 'bundles of care' (Department of Human Services 2007) implemented across Australia as a strategy to improve patient care and prevent avoidable deaths. This system, and its North American counterpart, the 100K Lives Campaign (Institute for Healthcare Improvement 2007) have clearly demonstrated a reduction in mortality. Despite the positive impact of policies and clinical practice guidelines there is still much to learn about the adoption, implementation (Shiffman et al. 2005) and continued application (Hesdorffer et al. 2002, Young et al. 2004) of these sources of information.

With the wide availability of institutional documents to support many clinical practice decisions there is a potential for a dependence on these as sources of information, although this is not widely described in the literature. Bennett (2004) describes epistemic dependence as the continued reliance on the testimony (written or verbal) of others. Epistemic dependence can be somewhat encouraged by the widespread implementation of institutional documents, policies in particular, because they are generally more concrete in their directions and requirements. Clinical practice guidelines allow for a greater degree of flexibility and allow clinicians to consider care options in relation to a patient's clinical presentation. Yet, in this case study, Alyson expressed concern that the proliferation of guidelines and increased availability of specialist nurses fostered a dependence on others for information, a concern echoed by Thompson (2001c) who suggested that reliance on other nurses may be a strategy for avoiding of responsibility for a decision. When considered in this context, the development of epistemic independence is appealing. Nevertheless, *complete* epistemic independence is unrealistic because it would require each of us to independently obtain knowledge through experience or to verify all that is told to us. In clinical practice epistemic independence is also limited by requisite knowledge and experience. This raises the question of how to establish an appropriate balance between the epistemic dependence and independence of clinical nurses.

6.6 The usefulness of information

Information is required in the clinical setting to help clinicians make the best possible decisions for their patients. The usefulness of this information will have a significant impact on its application in clinical practice as clinicians are unlikely to make use of sources with perceived low utility. As reported earlier, people are the preferred sources of information to assist with resolution of clinical uncertainty and these findings are consistent with the findings of others (Estabrooks et al. 2005a, Thompson et al. 2001a, Thompson et al. 2001c). The preference for people as sources of information has been extensively discussed previously. It is therefore worth considering what information was not considered useful for clinicians in their daily practice.

The context of clinical uncertainty logically has a bearing on the information required. As this study was conducted in the context of critical care nurses' enteral feeding practice it is not surprising that more general organisational documents, such as the infection control policy and procedures manual, Department of Health documents and pharmacy guidelines were not considered useful, even though they did contain information relevant to enteral feeding practice. In particular, information provided by the organisation that was not specific to intensive care (hospital policy and procedure manual) was viewed less favourably, even though it contained similar information to the intensive care unit policy and procedure manual.

The medium in which information was presented also had bearing on its usefulness in clinical practice. For most nurses print-based rather than electronic information was preferred. At case site 2 this was entirely understandable because the limited computer resources available made access to electronic information almost impossible. Jasmin commented about the lack of computers at case site 2 saying, "...every man and his dog is competing for it – you can almost certainly guarantee that you are going to get kicked off..." At case site 1, however, accessibility of electronic information was linked to both physical and intellectual accessibility. From Abigail's perspective electronic information was not useful

because she didn't have appropriate knowledge or skills and commented that she was not very good at using the computer because it was "too hard and too time consuming".

With the increase in technology use in society in general, and intensive care in particular, it would seem likely that over time an improvement in computer literacy would be observed. To some extent this is true. As McDowell and Ma (2007) show, over an eight-year period an increase in word processing, email and web use was observed in baccalaureate nursing students on entry to and completion of their program. However, a similar improvement was not observed in relation to the use of databases. This suggests that a knowledge-based deficit specific to databases rather than skill-based deficit might exist and highlights the greater emphasis that must be placed on both computer literacy and information seeking skills in pre-registration education and staff development. Improvement in these areas is likely to contribute to an increase in computer-based information (Secco et al. 2006) which is an important consideration as information technology continues to be rapidly integrated in healthcare.

Requisite knowledge and skills to effectively obtain information through electronic media warrants important consideration but may not be the only factor impacting on the usefulness of this information source. The healthcare environment is replete with information available in a variety of forms and often identical information is available in print and electronic-based versions. No published studies could be located that examined clinical nurses' preference of print or electronic media however a study by Tannery et al. (2007) indicated that after focused education, clinical nurses use of electronic information could be improved and result in fewer nurses relying on colleagues or print-based information.

Investigation into information-seeking behaviour of health sciences faculty suggested a preference by academics for the use of electronic information and it is likely that the use of electronic information today far exceeds the 45% reported for nursing academics (Curtis 1997). In the context of medical practice it appeared

that physicians preferred print based journals to their electronic counterparts however the purpose for which the information was sought was not clear (Tenopir et al. 2004). If the journal was being read for the purpose of keeping up to date it is not surprising that a reliance on print journals obtained through personal subscription would be observed. Seeking information to resolve clinical uncertainty is likely to result in a broader search for information.

The usefulness of information in clinical nursing practice will be influenced by the need for information, individual nurses' knowledge, skill in and attitudes to information acquisition, and available resources. While these are only some of the issues that impact on nurses perception of information utility, they warrant careful consideration because of the impact information use can have on the delivery of patient care.

6.7 Conclusion

This chapter has provided an overview of the two case sites which comprised this case study, highlighting their similarities and differences. The synthesis of findings from the two case sites have been presented and represent the preferential use of natural testimony as an important source of information registered nurses use to support clinical decisions and resolve clinical uncertainty. Importantly, a definition of natural testimony that best fits with clinical practice has been proposed. Because natural testimony, particularly that required to inform clinical decisions, comes predominantly from colleagues, the issues of source credibility and the veracity of information gained from natural testimony have been discussed.

The nature of inquiry by registered nurses was a key issue identified in this thesis and likely influenced the choice of information selected to support clinical decisions. At both case sites inquiry was limited and may have been impacted by individual nurse's approach to work, clinical leadership and clinical governance issues. When clinical uncertainty arose, nurses wanted information to be both accessible and useful however the accuracy of the information obtained was not

widely discussed, perhaps because assumptions of information veracity were made.

CHAPTER 7

INFORMATION USE: IMPLICATIONS FOR PRACTICE

7.1 Introduction

This final chapter provides a summary overview of the thesis, including the methodological approach, individual case site findings and results of the cross-case synthesis. Reflection on the study and thesis highlighted methodological issues relevant to the study design and data collection and these are discussed. In this chapter the implications of this research on nursing practice and nursing research are discussed. The chapter concludes with a discussion on the contribution this work makes to nursing practice.

7.2 Thesis Summary

This thesis set out to examine the use of information by critical care nurses to support clinical decision making, particularly within the context of clinical uncertainty. The study was specifically conducted in the context of enteral feeding practice, an area of clinical practice associated with a wide degree of variability and aimed to explore the information used to guide clinical decisions in this area of clinical practice. This thesis expands on existing work of others (Thompson et al. 2001, Thompson et al. 2001a, Estabrooks et al. 2005a, Estabrooks et al. 2005b) who also demonstrate nurses' preference for using colleagues as information sources when making clinical decisions. The work reported in this thesis adds to the existing literature in the area of information use by identifying the importance of evaluating the veracity of verbal testimony as a source of information and the credibility of individuals.

A number of key issues were originally identified to guide data collection and included the decisions that critical care nurses made regarding enteral feeding practice; the information used to support those decisions; how critical care nurses viewed the accessibility of these information sources; how useful the information

was in reducing the uncertainty around clinical decisions; and how senior nurse clinicians viewed the authority of information sources identified as being useful in supporting clinical decisions.

It was anticipated that this thesis would, in some way, further the understanding of both information use and the theoretical basis underpinning decisions specific to the enteral feeding practice of critical care nurses. Instead, data from this case study suggests information use is less about individual characteristics and the clinical context in which decisions are made, and more about the social, cultural and organisational influences that shape decision making, and the information selected to support those decisions.

To understand the complexities surrounding evidence-based decision making in critical care nursing practice a research approach was needed that allowed for exploration of this contemporary phenomenon within the context in which it occurs. Naturalistic paradigm was the lens through which this inquiry was conducted as it allowed for multiple realities to be explored without the need to establish causal links. Such an approach was beneficial in further developing an understanding of information use in clinical decision making. The study was conducted with qualitative research as the overarching research strategy and with case study method as the design framework. Case study method was used to capture the uniqueness of the case and the unstructured data derived prior to undertaking qualitative analyses. Multiple methods of data collection including concurrent verbal protocols (think aloud), observation, retrospective probing (interviews), Q sort and focus groups were required to capture the many diverse features of the case and promoted a deeper understanding of the phenomenon. The use of multiple case sites, which differed in terms of the research cultures within the respective intensive care units, allowed for theoretical replication thus making the study more robust.

Although the research culture at the two case sites differed this did not appear to have a substantial impact on the findings from each case site. In fact, analyses of data from each case site were remarkably similar. Key findings from each case

site included making decisions and information sources used to support clinical decisions and because of the focus of data collection were expected to feature strongly in the data. Findings that were not anticipated but were strongly represented in the data at both case sites included the veracity of information and the nature of inquiry. Case site 2 had an additional finding centred on workplace culture and information use.

Cross-case synthesis highlighted three areas for consideration. First, the preference of natural testimony (information obtained verbally from others) to support clinical decision making and the resolution of clinical uncertainty. However, for most nurses, it appeared as though information veracity was not usually considered. The authority and credibility of the person providing the information seemed to be of greater import. Second, inquiry by nurses was infrequent and often limited to issues pertaining to work processes. Inquiry relating to nursing practice itself or further exploration of areas of clinical uncertainty was not demonstrated. Inquiry by nurses was constrained by their approach to work, a culture of inquiry in the workplace, clinical leadership and clinical governance strategies. Finally, nurses' perceptions of the usefulness of the various information sources available in the clinical environment were identified. The media through which information was provided impacted nurses' information-seeking behaviour. The overwhelming preference to use the verbal testimony of others as a primary (and often sole) information source meant that neither print- or electronic-based media were considered overly useful.

It is inevitable that a study addressing a complex social phenomenon such as information use to support decision making would highlight important methodological and procedural issues useful in refining future studies in this area. The following section highlights the methodological issues identified during the conduct of the study, data analyses and writing of the thesis.

7.2.1 Methodological issues

The use of case studies for research, Yin (2003) claims, 'remains one of the most challenging of all social science endeavours' (p.1). It is the development of

the research design that can be particularly difficult because each case study requires its own design. Using case study method for this research has been invaluable. Not only was it the most appropriate to address the issue under investigation but it was one that presented challenge and extended research acumen. During this research the opportunities for learning were as plentiful as they were diverse. Importantly learning continued while reflecting on the both the study and this thesis. This section of the thesis is intended for discussing some of the methodological discoveries experienced during this research project that related specifically to study design and the collection of data.

7.2.1.1 Study design

This case study comprised two case sites, both intensive care units and the registered nurses working within them. Additional case sites would have been advantageous in their contribution to the development of a better understanding of information used by registered nurses in situations of clinical uncertainty. However, the resources and time available precluded such an endeavour. The selection of the case sites and the context in which data were collected, while valuable for critical care nursing practice, may be difficult to extrapolate to other nursing specialities as a difference between nursing roles in highly complex environments may be considerably different to other areas (Estabrooks et al. 2005a).

In designing this study consideration was given to the context of critical care nursing practice. The findings from this case study highlight the importance of organisational culture in determining what information nurses select to support their clinical practice. Since the initial conception of this study, the influence of organisational culture on information use, and research use in particular, has been well described in the literature (Cummings et al. 2007, Meijers et al. 2006, Scott-Findlay and Estabrooks 2006). A greater appreciation of how organisational culture impacts nurses use of information in decision making would have further shaped the selection of participants and data collection strategies used in this study thus contributing to a deeper understanding of the many issues that impact on information use by nurses in the clinical setting.

A variety of data collection strategies were used in this study and included concurrent verbal protocols (think aloud), observation, retrospective probing (interviews), Q sort and focus groups. Each data collection strategy was specifically selected for its strength and for its ability to overcome weaknesses associated with other strategies. On reflection, Q methodology was the research method and data collection strategy that contributed least to understanding the phenomenon of information use in decision making associated with clinical uncertainty. While the intent of Q methodology was to provide an avenue through which participants could subjectively express their views on the usefulness and accessibility of various information sources (Watts and Stenner 2005) its full potential was not achieved in this study. In Q methodology a comprehensive understanding of the various perspectives can be identified by conducting individual interviews from individuals who load to particular perspectives. This strategy was not employed in this study and limited the development of a more complete understanding of each perspective. While data from the think aloud and focus group stages of data collection were used to illustrate particular issues it remains uncertain whether the participants whose statements were used shared that particular viewpoint.

7.2.1.2 Collection of data

During the study data collection issues were identified and specific to each case site. Case site 1 data collection proceeded smoothly. In contrast, specific issues impacting on data collection were experienced at case site 2. Surprisingly, recruitment for the think aloud stage of data collection was uneventful, likely because some nurses did not perceive this as additional work. However, as described in Chapter 5, nurses seemed more reticent to participate in the Q sort stage of data collection. It is not entirely clear why the reluctance to complete the Q sorts was so pervasive, and that it persisted even when site visits encouraging completion were initiated and incentives to complete were introduced. Initially, the difficulty collecting this data was disappointing but closer consideration suggested that the response to the conduct of research in the clinical area may in fact be telling an important story. Many references were made to a lack of time to

complete the Q sorts, its low priority compared to clinical work (even when patient loads and acuity were low), and a lack of enthusiasm for completing the Q sort outside of work time.

Further, the collection of data during focus group interviews at case site 2 was impacted by the interpersonal dynamics within the group. While Strong et al. (1994) suggests that focus groups can be conducted with fewer than six participants, at this case site it was not necessarily the number of senior nurse clinicians participating but rather the dynamic that existed between those present. During the focus group interviews there was clearly a power differential in play. The established relationships between the three senior nurse clinicians was such that one individual almost always spoke first following a question or statement by the researcher. One senior nurse clinician, while nodding in agreement with what others said, only spoke to direct questions. This dynamic was not surprising because data obtained during stage 1 (think aloud stage of data collection) suggested that one senior nurse clinician was not open to challenge or discussion and expected conformity to decisions and opinions. It is reasonable to assume that this dynamic impacted on the quantity and quality of the data that could be extracted during this focus group. Interestingly, one focus group participant felt the need to express their viewpoint and established contact with the researcher after the focus group was completed. On reflection, data obtained during the think aloud stage should have alerted the researcher to the possibility that focus group interviews may be disadvantageous at this particular site and that individual interviews of the senior nurse clinicians may have yielded richer and more complete data.

7.3 Implications for nursing practice

The findings of this thesis have several implications for nursing practice and nursing research. A nursing practice based on the best available evidence was valued by participants in this study. However, the expectation that individual nurses were direct users of primary research was not appreciated. Rather the use of research in clinical practice was welcomed if the transfer of research findings

into clinical practice could occur through another nurse who served as an 'information conduit'. The valuing of this type of pre-appraised information highlights a need to ensure those clinical nurses identified most frequently as credible information sources have the requisite knowledge, skills and attitudes to effectively promote evidence-based practice.

Identifying those who would serve as reliable providers of information was linked to the notion of clinical credibility. We therefore need to carefully consider what defines the construct of clinical credibility in order to allow clinicians to develop in themselves, and determine in others, the characteristics associated with clinical credibility. Thompson (2001c) has suggested that nurses with a combination of clinical expertise, experience and perceived research-based knowledge are associated with a high degree of utility as information sources and it may be that such characteristics are indicative of the notion of clinical credibility.

Clinical credibility has not been well described in the literature but has been associated with notions of trustworthiness and expertise (McGinnies and Ward, 1980, Peters et al. 1997). The literature that does exist primarily examines the notion of clinical credibility in the context of nurse teachers (Fawcett and McQueen 1994). The absence of a body of literature discussing clinical credibility of clinicians is curious. Is there perhaps an assumption that if the primary role of a nurse is patient care and that the nurse meets expectations of experience and trustworthiness, that they are therefore clinically credible? Establishing clearly what clinical credibility means, and to what extent trustworthiness and expertise play a role in the establishment of credibility, is an important debate for nursing and builds on existing work concerning the nurse expert (Benner et al. 1996, Thornley 2007).

Establishment of clinical credibility is an important step to identify the nurses best suited to be providers of natural testimony and a conduit through which evidence-based practice might be introduced into the clinical area. The ability to effectively transfer knowledge does, however, depend on the knowledge, skills

and attitudes of the individual nurse. At present, it is unlikely that registered nurse preparation within the tertiary sector or postgraduate nursing programs effectively develop nurses able to successfully function in a knowledge transfer role. Recognition of the importance of the role nurses, particularly those with extensive clinical experience and knowledge, can have as providers of information is a compelling reason to discuss and debate the desired outcomes from higher education, particularly at a post graduate level.

7.4 Implications for nursing research

The findings from this thesis highlight several areas for further research. First, there is recognition that nurses rely on verbal testimony to inform clinical decisions however it is less clear why such a preference for this type of information exists. Initially, nurses speak of the accessibility and convenience of verbal testimony, and particularly value the ease and speed with which this information can be obtained. Yet broader reaching factors impacting on the reliance of others for information may be unrecognised. Research as to why nurses privilege verbal testimony over other sources of information highlights an important area for future research.

The use of verbal testimony as information might possibly be explained by nurses' need for affirmational support when making clinical decisions (Estabrooks et al. 2005b). The communication between colleagues as a result of seeking verbal testimony as information may provide a level of affirmational support desired by some nurses and explain the tendency to seek information from a colleague in the first instance. What is not well understood is why some nurses desire affirmational support when making clinical decisions. Whether the need for affirmational support is inherent in some nurses or whether there is a perceived need to share the responsibility, and perhaps accountability, for a decision may be what prompts nurses to invite others into the decision making process. Developing a deeper understanding of the use of verbal testimony is achieving affirmational support and its role in the decision making process warrants further investigation.

Verbal testimony may be an important strategy to bridge the research-practice gap. However, strategies to ensure effective transfer of knowledge need to be clearly defined, developed and tested. In particular, nurses that may be identified as effective knowledge translators need to be adequately prepared for their role as providers of information and in modelling decision making. An important step in this process is the conduct of research that clearly demonstrates a positive impact on clinically meaningful outcomes for patients.

The suggestion that verbal testimony is best sought from clinically credible nurses emphasises the work that is required to clarify the construct of clinical credibility, particularly as it relates to nurses currently working in the clinical arena. This should be followed by work directed at the identification and development of clinically credible nurses who might facilitate knowledge transfer in the clinical setting. Following this developmental work it will be necessary to rigorously evaluate the impact of such nursing roles on clinical decision making, including the decision making process, decision outcomes and their impact on patient outcomes.

7.5 The contribution of this work to the discipline of nursing

At present we have a developing understanding of nurses' use of information in the context of routine clinical practice (Estabrooks et al. 2005a, Estabrooks et al. 2005b) and in situations of clinical uncertainty (Thompson et al. 2001b). This thesis framed the use of information within the real-world of intensive care nursing practice and contextualised the need for information in situations of clinical uncertainty. The work of this thesis makes an important contribution to the continuing development of our understanding of information use in clinical practice by making important links between philosophical perspectives of verbal testimony (Lackey 2006b) and the strong oral tradition of information seeking that is observed in nursing practice and specifically highlighted in this thesis. While verbal testimony as a preferred source of information for clinical practice and decision making has been highlighted by others, Estabrooks et al. (2005b) caution against the indiscriminate trust of this type of information and this thesis further adds to these views by acknowledging the variability in information provided by

individuals and articulating ways in which clinical nurses may be able to evaluate verbal testimony.

As observed within the intensive care unit, the use of natural testimony, specifically verbal testimony, as a preferred source of information is not surprising. The reliance on verbal testimony was initially concerning, particularly in light of the profession's focused and concerted effort towards establishing evidence-based practice within critical care nursing and the expectation of patients and the community that they receive health care underpinned by the best available evidence. The continued dependence by critical care nurses on verbal testimony and the realisation that judgements of information quality relied on perceived, but often unscrutinised, trustworthiness of an individual rather than a systematic determination of information veracity was a central finding of this thesis.

Further, the high propensity for variability in information provided through verbal testimony is suggestive of a practice that may not be based on the best available evidence. In that light verbal testimony should not be overtly encouraged if the tenets of evidence-based practice wish to be upheld. However, an assumption that information provided through verbal testimony is not based on the best available evidence may be imprudent as it is not yet clear to what extent nurses are able to successfully transfer knowledge into clinical practice through the discipline's well established oral tradition. It may well be that verbal testimony is an important strategy to establish patient care that is based on the best available evidence. What is required is a strategy to assist nurses in determining the veracity of information provided through verbal testimony.

Strategies for determining the veracity of research-based information are well described in the literature, there is less specific direction provided evaluating the veracity of verbal testimony. Fallis (2004), borrowing from Hume's work *An enquiry concerning human understanding* (2004 – originally published 1742) identified four criteria – authority; plausibility; independent corroboration; and presentation – that could be applied when determining the accuracy of web-based information. These four criteria were applied to data gathered for this thesis and

consequently it was demonstrated that nurses were most reliant on the perceived authority and clinical credibility of the person providing the information. The reliance on the characteristics of the individual providing the information rather than on determining the veracity of the information itself is troubling as it is suggestive of the 'indiscriminate trust' previously described by Estabrooks et al. (2005b). Authority was frequently linked to position while clinical credibility was associated with years of experience and perceived expertise and/or knowledge. However nurses were unable to clearly describe strategies used in determining the clinical credibility of an individual which is not surprising given the dearth of literature in this area.

The notion of clinical credibility has been most frequently described in relation to nurses who have moved into academic roles (Fawcett & McQueen 1994, Goorapah 1997) and no literature was located that discussed clinical credibility of nurses working directly in patient care. It is possible that the notion of clinical credibility may play an important part helping nurses determine the most appropriate colleague from whom to solicit information but as yet our understanding of what clinical credibility is, how it is determined and the best strategies to identify those with clinical credibility is underdeveloped and requires further discussion and debate.

The pervasiveness with which nurses rely on others to provide information suggests this practice is so entrenched that any attempt to alter this practice would be unsuccessful. Should then the use of verbal testimony as information in clinical practice be discouraged? Nurses clearly favour experiential, relational and interactive resources (Estabrooks 2005) and identify formal sources such as original research and institutional documents as being less accessible and useful (Thompson 2001). This clearly denotes the importance of verbal testimony in the context of clinical practice and it therefore must be considered carefully as a strategy for providing information, particularly research-based information. This is not to suggest that an indiscriminate trust in verbal testimony is warranted, but perhaps points to a need for the development and testing of strategies that enable those providing information to convey their expertise as a clinician as well as a

user and provider of information in addition to articulating the veracity of information being provided.

The reliance on verbal testimony must also be considered in the context of current organisational structures and clinical governance strategies. This thesis highlighted the impact of organisational culture and work structures on inquiry, information use and decision making by critical care nurses. As the work structures currently in place in Australia are unlikely to undergo significant change in the coming years it is imperative to fully understand their impact on the use of information by nurses and effective delivery of evidence-based patient care. Traditional strategies for disseminating and implementing evidence-based practice do not appear to have been as effective as anticipated. Development of evidence-based clinical practice guidelines, protocols, and the like may be useful in evaluating and consolidating the vast array of information available in a particular area but if nurses are not accessing these documents as a primary source of practice information and continue to rely on the verbal testimony of others then it is likely that practice variability will continue and the potential for evidence-based will not be achieved. The concentration on the development of evidence-based practice documents may reflect in some way the emphasis nursing education places on the development of critical appraisal techniques while there is little, if any, focus placed on the use or application of research evidence in clinical practice. For any information to be useful strategies to promote the transfer of knowledge into clinical practice need to be developed, evaluated and integrated into pre-registration nursing education.

The acceptance of clinical governance strategies designed to promote a consistency in practice and to ensure optimal patient care is problematic for the profession of nursing which values inquiry and the exercising of clinical judgement by nurses. The findings in this thesis have highlighted the apparent conflict between the goals of the nursing profession and those of health care providers. This tension between independent decision making and the implementation of evidence based practice and clinical governance strategies may be reflective of the lack of cohesion between the professional goals of nursing and

the health care system that employs them. The tertiary education sector is focused on developing professional nurses capable of making informed and independent decisions. But how does this aspect of practice fit within the context of organisational expectations that suggest nurses must practice within established parameters, whether they are formal documents, such as policies and procedures, or less formal such as the dictum that you must conform to the practice norms within the work environment.

Ultimately, the current health care system in Australia and the wider community expect an evidence base for practice together with clinical governance strategies that promote safe practice. Nurses, as part, of this system must be accountable for both in the context of their clinical practice. How to best balance the complementary and simultaneously competing ideals that underpin current clinical governance strategies, the desire and need for an evidence base for practice in nursing and the preference of clinical nurses for information provided through the verbal testimony of colleagues requires further deliberation.

REFERENCE LIST

- Adamson, C. (1990) Clinical uncertainty in the medical encounter: An idiographic account of an illness trajectory defined by inflammatory bowel disease and avascular necrosis. *Sociology of Health and Illness*, **19**(2), 159-133
- Aitken, L.M. & Mardegan, K.J. (2000) "Thinking aloud": Data collection in the natural setting. *Western Journal of Nursing Research*, **22**(7), 841-53.
- Alavi, M. & Leidner, D.E. (2001) Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, **25**(1), 107-136.
- Armstrong, P. (1999) The role of the Clinical Nurse Specialist. *Nursing Standard*, **13**(16), 40-42.
- Attree, M. (2005) Nursing agency and governance: registered nurses' perceptions. *Journal of Nursing Management*, **13**(5), 387-96.
- Audi, R. (1997) The place of testimony in the fabric of knowledge and justification. *American Philosophical Quarterly*, **34**(4), 405-423.
- Australian College of Critical Care Nurses (2002) Competency Standards for Specialist Critical Care Nurses. Australian College of Critical Care Nurses, Melbourne, Victoria.
- Australian Nursing and Midwifery Council (2005) *ANMC Competency Standards for the Registered Nurse*, Australian Nursing and Midwifery Council, Dickson, ACT.
- Baessler, C.A., Blumbert, M., Cunningham, J.S., Curran, J.A., Fennessey, A.G., Jacobs, J.M., McGrath, P., Perrong, M.T. & Wolf, Z.R. (1994) Medical-surgical nurses' utilization of research methods and products. *MEDSURG Nursing*, **3**(2), 113-117, 120-121, 141.
- Barbosa, J.C., Willoughby, P., Rosenberg, C.A. & Mrtek, R.G. (1998) Statistical Methodology: VII. Q-Methodology, a structural analytic approach to medical subjectivity. *Academic Emergency Medicine*, **5**(10), 1032-1040.
- Barta, K.M. (1995) Information-seeking, research utilization, and barriers to research utilization of pediatric nurse educators. *Journal of Professional Nursing*, **11**(1), 49-57.
- Baumann, A. & Bourbonnais, F. (1982) Nursing decision making in critical care areas. *Journal of Advanced Nursing*, **7**, 435-446.

- Baumann, A.O., Deber, R.B. & Thompson, G.G. (1991) Overconfidence among physicians and nurses: the 'micro-certainty, macro-uncertainty' phenomenon. *Social Science and Medicine*, **32**(2), 167-174.
- Benner, P., Tanner, C.A. & Chesla, C.A. (1996) *Expertise in Nursing Practice: Caring, Clinical Judgment and Ethics*, Springer Publishing Company, New York.
- Bennett, P.H. (2004) Education as testimony. Conference paper presented at *Philosophy of Education Society of Australasia*, Melbourne, Victoria.
- Bersten, A.D., Soni, N. & Oh, T.E. (eds.) (2003) *Oh's Intensive Care Manual*, Butterworth-Heinemann, Edinburgh.
- Biemiller, A. & Meichenbaum, D. (1992) The nature and nurture of the self-directed learner. *Educational Leadership*, **50**(2), 75-80.
- Bird, G. & Heekin, J.M. (1994) Survey on the use of information sources in the field of aging. *Bulletin of the Medical Library Association*, **82**(1), 30-35.
- Blythe, J. (1992) Information-seeking patterns of health science professionals. *Bibliotheca Medica Canadiana*, **14**(2), 82-89.
- Blythe, J. & Royle, J.A. (1993) Assessing nurses' information needs in the work environment. *Bulletin of the Medical Library Association*, **81**(4), 433-435.
- Bohannon, R.W. (1990) Information accessing behaviour of physical therapists. *Physiotherapy Theory and Practice*, **6**, 215-225.
- Booth, A. (2005) Using research in practice. *Health Information and Libraries Journal*, **22**, 150-155.
- Boström, A.M., Wallin, L. & Nordström, G. (2007) Evidence-based practice and determinants of research use in elderly care in Sweden. *Journal of Evaluation in Clinical Practice* **13**(4), 665-673.
- Bowden, V.M., Kromer, M.E. & Tobia, R.C. (1994) Assessment of physicians' information needs in five Texas counties. *Bulletin of the Medical Library Association*, **82**, 189-196.
- Bradley, E.H., Webster, T.R., Baker, D., Schlesinger, M., Inouye, S.K., Barth, M.C., Lapane, K.L., Lipson, D., Stone, R. & Koren, M.J. (2004) Translating research into practice: speeding the adoption of innovative health care programs. Report for The Commonwealth Fund, New York, New York.
- Branch, J.L. (2000) Investigating the information-seeking processes of adolescents: The value of using think-alouds and think afters. *Library and Information Science Research*, **22**(4), 371-392.

- Brand, M. (1984) *Intending and acting: Toward a naturalized action theory*, The MIT Press, Cambridge, MA.
- Brouwer, M. (1999) Q is accounting for tastes. *Journal of Advertising Research*, **39**(2), 35-39.
- Bruce, B. (2000) Credibility of the Web: Why we need dialectical reading. *Journal of Philosophy of Education*, **34**(1), 97-109.
- Bryant, S.L. (2000) The information needs and information seeking behaviour of family doctors: a selective literature review. *Health Libraries Review*, **17**, 83-90.
- Bucknall, T. (2003) The clinical landscape of critical care: nurses' decision making. *Journal of Advanced Nursing* **43**(3), 310-319.
- Bucknall, T. (2007) A gaze through the lens of decision theory: toward a knowledge translation science. *Nursing Research* **56**(4S), S60-S66.
- Burge, T. (1998) Computer proof, a priori knowledge and other minds. *Philosophical Perspectives*, **32**(Supplement: Philosophical Perspectives, 12, Language Mind and Ontology), 1-37.
- Campbell, T.D. & Fiske, D.W. (1959) Convergent and discriminant validation by the multitrait-multi-method matrix. *Psychological Bulletin*, **56**, 81-105.
- Carey, M. (1994) The group effect in focus groups: planning, implementing, and interpreting focus group research. In Morse, J. M. (ed). *Critical Issues in Qualitative Research Methods*, Sage Publications, Thousand Oaks, California.
- Carnett, W.G. (2002) Clinical practice guidelines: a tool to improve care. *Journal of Nursing Care Quality*, **16**(3), 60-70.
- Carper, B. (1978) Fundamental patterns of knowing in nursing. *Advances in Nursing Science*, **1**(1), 13-23.
- Casebeer, L., Bennett, N., Kristofco, R., Carillo, A. & Centor, R. (2002) Physician internet medical information seeking and on-line continuing education use patterns. *The Journal of Continuing Education in the Health Professions*, **22**, 33-42.
- Coady, C.A.J. (1992) *Testimony: a philosophical study*, Clarendon Press, Oxford
- Corcoran-Perry, S. & Graves, J. (1990) Supplemental-information-seeking behavior of cardiovascular nurses. *Research in Nursing & Health*, **13**, 119-127.

- Covell, D.G., Gwen, C., Uman, R.N. & Manning, P.R. (1985) Information needs in office practice: are they being met? *Annals of Internal Medicine*, **103**(4), 596-599.
- Crawford, J. & Haaland, G. (1972) Predecisional information seeking and subsequent conformity in the social influence process. *Journal of Personality and Social Psychology*, **23**, 112-119.
- Crutcher, R.J. (1994) Telling what we know: The use of verbal report methodologies in psychological research. *Psychological Review*, **5**(5), 241-244.
- Cullum, N., Ciliska, D., Marks, S., & Haynes, B. (2008) An introduction to evidence-based nursing. In Cullum, N., Ciliska, D., Haynes, R.B., & Marks, S. (eds). *Evidenced-based Nursing: An introduction*, Blackwell Publishing, Oxford.
- Cullum, N., Ciliska, D., Haynes, R.B. & Marks, S. (eds.) (2008) *Evidence-based nursing: An introduction*, Blackwell Publishing, Oxford.
- Cullum, N., DiCenso, A. & Ciliska, D. (1998) Evidence-based nursing: an introduction. *Evidence Based Medicine*, **3**(2), 37-8.
- Cummings, G.G. (2004) Investing relational energy: The hallmark of resonant leadership. *Canadian Journal of Nursing Leadership*, **17**, 76-87.
- Cummings, G.G., Estabrooks, C.A., Midodzi, W.K., Wallin, L. & Hayduk, L. (2007) Influence of organizational characteristics and context on research utilization. *Nursing Research*, **56**(4S), Supplement: S24-39.
- Curtis, K.L., Weller, A.C. & Hurd, J.M. (1997) Information-seeking behavior of health sciences faculty: the impact of new information technologies. *Bulletin of the Medical Library Association*, **85**(4), 402-410.
- Dee, C. (1993) Information needs of the rural physician: a descriptive study. *Bulletin of the Medical Library Association*, **81**(3), 259-264.
- Dennis, K.E. (1986) Q methodology: relevance and application to nursing research. *Advances in Nursing Science*, **8**(3), 6-17.
- Department of Human Services (2007) Safer systems saving lives. State Government of Victoria, Melbourne, Victoria.
- Donner, J.C. (2001) Using Q-sorts in participatory processes: An introduction to the methodology. In Krueger, R. A., Casey, M. A., Donner, J., Kirsch, S. and Maack, J. N. (eds.) *Social Analysis: Selected Tools and Techniques*, Paper Number 36, The World Bank, Washington, DC.

- Doran, D.M. & Sidani, S. (2007) Outcomes-focused knowledge translation: a framework for knowledge translation and patient outcomes improvement. *Worldviews on Evidence-based Nursing* **4**(1), 3-13.
- Eddy, D. (1994) Variations in physician practice: the role of uncertainty. *Health Affairs*, **3**, 74-89.
- Ellayan, R.M. (1988) The use of information by physicians. *International Library Review*, **20**, 247-265.
- Ericsson, K.A. & Simon, H.A. (1993) *Protocol Analysis: Verbal Reports as Data*, The MIT Press, Cambridge.
- Estabrooks, C.A. (1998) Will evidence-based nursing practice make practice perfect? *Canadian Journal of Nursing Research*, **30**(1), 15-36.
- Estabrooks, C.A. (1999) Mapping the research utilization field in nursing. *Canadian Journal of Nursing Research*, **31**(1), 53-72.
- Estabrooks, C.A., Chong, H., Brigidear, K. & Profetto-McGrath, J. (2005a) Profiling Canadian nurses' preferred knowledge sources for clinical practice. *Canadian Journal of Nursing Research*, **37**(2), 119-40.
- Estabrooks, C.A., Floyd, J.A., Scott-Findlay, S., O'Leary, K.A. & Gushta, M. (2003) Individual determinants of research utilization: a systematic review. *Journal of Advanced Nursing*, **43**(5), 506-20.
- Estabrooks, C.A., Rutakumwa, W., O'Leary, K.A., Profetto-McGrath, J., Milner, M., Levers, M.J. & Scott-Findlay, S. (2005b) Sources of practice knowledge among nurses. *Qualitative Health Research*, **15**(4), 460-76.
- Estabrooks, C.A., Winther, C. & Derksen, L. (2004) Mapping the field: a bibliometric analysis of the research utilization literature in nursing. *Nursing Research*, **53**(5), 293-303.
- Fallis, D. (2004) On verifying the accuracy of information: Philosophical perspectives. *Library Trends*, **52**(3), 463-487.
- Faulkner, P. (2000) The social character of testimonial knowledge. *The Journal of Philosophy*, **97**(11), 581-601.
- Faulkner, P. (2002) On the rationality of our response to testimony. *Syntheses*, **131**, 353-370.
- Fawcett, T.N. & McQueen, A. (1994) Clinical credibility and the role of the nurse teacher. *Nurse Education Today*, **14**(4), 264-71.
- Fink, R., Thompson, C.J. & Bonnes, D. (2005) Overcoming barriers and promoting the use of research in practice. *Journal of Nursing Administration*, **35**(3), 121-9.

- Flaming, D. (2003) Orality to literacy: effects on nursing knowledge. *Nursing Outlook*, **51**(5), 233-238.
- Forsythe, D.E. (1998) Using ethnography to investigate life scientists' information needs. *Bulletin of the Medical Library Association*, **86**(3), 402-9.
- Fox, R.C. (2000) Medical uncertainty revisited, In Albrecht, G.L., Fitzpatrick, R. & Scrimshaw, C. (eds.) *Handbook of Social Studies in Health and Medicine*, Sage Publications, London.
- French, B. (2005) Evaluating research for use in practice: what criteria to specialist nurses use? *Journal of Advanced Nursing*, **50**(3), 235-243.
- Fricker, E. (1995) Telling and trusting: Reductionism and anti-reductionism in the epistemology of testimony. *Mind*, **104**, 393-411.
- Fulbrook, P. (2003) Developing best practice in critical care nursing: knowledge, evidence and practice. *Nursing in Critical Care*, **8**(3), 96-102.
- Galway, R., Harrod, M.E., Crisp, J., Donnellan, R., Hardy, J., Harvey, A., Maurice, L., Petty, S. & Senner, A. (2003) Central venous access and handwashing: variability in policies and practices. *Paediatric Nursing*, **15**(10), 14-8.
- Genuis, S.J. (2005) The proliferation of clinical practice guidelines: Professional development or medicine-by-numbers? *Journal of the American Board of Family Practitioners*, **18**, 419-425.
- Glacken, M. & Chaney, D. (2004) Perceived barriers and facilitators to implementing research findings in the Irish practice setting. *Journal of Clinical Nursing*, **13**, 731-740.
- Goorapah, D. (1997) Clinical competence/clinical credibility. *Nurse Education Today*, **17**(4), 297-302.
- Gopee, N. (2002) Human and social capital as facilitators of life-long learning in nursing. *Nurse Education Today*, **22**, 608-616.
- Graham, P.J. (1997) What is testimony. *The Philosophical Quarterly*, **47**, 227-232.
- Gravois, S.L., Fisher, W., Patrick, S.C. & Bowen, D.M. (1995) Information-seeking practices of dental hygienists. *Bulletin of the Medical Library Association*, **83**(4), 446-452.
- Griffiths, P. & Riddington, L. (2001) Nurses' use of computer databases to identify evidence for practice - a cross-sectional questionnaire survey in a UK hospital. *Health Information and Libraries Journal*, **18**, 2-9.

- Gruppen, L.D. (1990) Physician information seeking: improving relevance through research. *Bulletin of the Medical Library Association*, **78**, 165-172.
- Hall, E.F. (1995) Physical therapists in private practice: Information sources and information needs. *Bulletin of the Medical Library Association*, **83**(2), 196-201.
- Hammersley, M. (2000) Case study and theory. In Gomm, R., Hammersley, M. and Foster, P. (eds.) *Case Study Method*, Sage Publications, London.
- Hardwig, J. (1985) Epistemic dependence. *Journal of Philosophy*, **82**(7), 335-349.
- Haug, J.D. (1997) Physicians' preferences for information sources: a meta-analytic study. *Bulletin of the Medical Library Association*, **85**(3), 223-232.
- NSW Department of Health (2005a) Public health system nurses' and midwives (State) award. Government of NSW, St Leonards, NSW.
- NSW Department of Health (2005b) NSW Clinical Governance Directions Statement. NSW Department of Health, North Sydney, NSW.
- Heron, P. (1995) Disinformation and misinformation through the Internet: Findings of an exploratory study. *Government Information Quarterly*, **12**(2), 133-139.
- Herriott, R.E. & Firestone, W.A. (1983) Multisite qualitative policy research: Optimizing description and generalizability. *Educational Researcher*, **12**, 14-19.
- Hesdorffer, D.C., Ghajar, J. & Iacono, L. (2002) Predictors of compliance with the evidence-based guidelines for traumatic brain injury care: A survey of United States trauma centres. *The Journal of Trauma, Injury, Infection and Critical Care*, **52**(6), 1202-1209.
- Hester-Moore, J.S. (2005) Handling uncertainty: Standard and local practices in the case of libido and contraception in evidence-based decision-making. *Health Sociology Review*, **14**, 174-186.
- Holmes, D., Perron, A. & O'Byrne, P. (2006) Evidence, virulence, and the disappearance of nursing knowledge: a critique of the evidence-based dogma. *Worldviews on Evidence-Based Nursing*, **3**(3), 95-102.
- Huag, J.D. (1997) Physicians' preference for information sources: a meta-analytic study. *Bulletin of the Medical Library Association*, **85**(3), 223-232.
- Hume, D. (2004 (originally published 1742)) *An enquiry concerning human understanding*, Digireads.com, Lawrence, KS.

- Institute for Healthcare Improvement (2007) Critical Care. Institute for Healthcare Improvement, Cambridge, MA.
- Jackson, D. (2008) Servant leadership in nursing: a framework for developing sustainable research capacity in nursing. *Collegian*, **15**, 27-33.
- Jones, J.J. (1989) The verbal protocol: A research technique for nursing. *Journal of Advanced Nursing*, **14**, 1062-1070.
- Kennedy, C. (1998) Ways of knowing in palliative nursing. *International Journal of Palliative Nursing*, **4**(5), 240-245.
- Kennedy, M.M. (1983) Working knowledge. *Knowledge: Creation, Diffusion, Utilization*, **5**(2), 193-211.
- Kitzinger, J. (1994) The methodology of focus groups: the importance of interaction between research participants. *Sociology of Health and Illness*, **16**(1), 103-121.
- Knodel, J. (1993) The design and analysis of focus group studies. In Morgan, D. L. (ed.) *Successful focus groups: Advancing the state of the art*, Sage Publications, Thousand Oaks, California.
- Korjonen-Close, H. (2005) The information needs and behaviours of clinical researchers: a user-needs analysis. *Health Information and Libraries Journal*, **22**, 96-106.
- Kramer, M., Maguire, P. & Schmalenberg, C.E. (2006) Excellence through evidence: the what, when, and where of clinical autonomy. *Journal of Nursing Administration*, **36**(10), 479-91.
- Kuusela, H. & Paul, P. (2000) A comparison of concurrent and retrospective verbal protocol analysis. *The American Journal of Psychology*, **113**(3), 387-404.
- Lackey, J. (2006a) Learning from words. *Philosophy and Phenomenological Research*, **LXXIII**(1), 77-101.
- Lackey, J. (2006b) The nature of testimony. *Pacific Philosophical Quarterly*, **87**, 177-197.
- Lake, E.T. & Friese, C.R. (2006) Variations in nursing practice environments. *Nursing Research*, **55**(1), 1-9.
- Lathey, J.W. & Hodge, B. (2001) Information seeking behavior of occupational health nurses. *AAOHN Journal*, **49**(2), 87-95.
- Liaschenko, J. & Fisher, A. (1999) Theorizing the knowledge that nurses use in the conduct of their work. *Scholarly Inquiry for Nursing Practice*, **13**(1), 29-41.

- Lincoln, Y.S. & Guba, E.G. (1985) *Naturalistic inquiry*, Sage, Newbury Park.
- Luker, K.A., Hogg, C., Austin, L., Ferguson, B. & Smith, K. (1998) Decision making: the context of nurse prescribing. *Journal of Advanced Nursing*, **27**, 657-665.
- Luker, K.A. & Kenrick, M. (1992) An exploratory study of the sources of influence on the clinical decisions of community nurses. *Journal of Advanced Nursing*, **17**, 457-466.
- Luker, K.A. & Kenrick, M. (1995) Towards knowledge-based practice: an evaluation of a method of dissemination. *International Journal of Nursing Studies*, **2**, 59-67.
- MacGuire, J.M. (2006) Putting nursing research findings into practice: research utilization as an aspect of the management of change. *Journal of Advanced Nursing*, **5**(1), 65-74.
- Marshall, A. (2001) Gastric tonometry and enteral feeding: a possible conflict in critical care nursing practice. Master of Nursing (Research) Thesis. Department of Clinical Nursing, The University of Sydney, Sydney, Australia, pp. 182.
- Marshall, A., West, S. (2004) Nutritional intake in the critically ill: Improving practice through research. *Australian Critical Care*, **17**(1), 6-15.
- Marshall, A.P. & West, S.H. (2006) Enteral feeding in the critically ill: are nursing practices contributing to hypocaloric feeding? *Intensive and Critical Care Nursing*, **22**(2), 95-105.
- Martin, G. (1998) Empowerment of dying patients: the strategies and barriers to patient autonomy. *Journal of Advanced Nursing*, **28**, 737-744.
- McCaughan, D., Thompson, C., Cullum, N., Sheldon, T. & Raynor, P. (2005) Nurse practitioner and practice nurses' use of research information in clinical decision making: findings from an exploratory study. *Family Practice*, **22**, 490-497.
- McDowell, D.E. & Ma, X. (2007) Computer literacy in baccalaureate nursing students during the last 8 years. *CIN: Computers, Informatics, Nursing*, **25**(1), 30-8.
- McGinnies, E. & Ward, C.D. (1980) Better liked than right: trustworthiness and expertise as factors in credibility. *Personality and Social Psychology Bulletin*, **6**(3), 467-472.
- McKeown, B. & Thomas, D. (1988) *Q Methodology*, Sage Publications, Newbury Park.

- McKnight, M. (2001) An observational investigation of information seeking and use by nurses at work in a non-teaching community hospital: implications for hospital librarians. *Hypothesis*, **15**(2), 11-12.
- McKnight, M. (2006) The information seeing of on-duty critical care nurses: evidence from participant observation and in context interviews. *Journal of the Medical Library Association*, **94**(1), 145-151.
- McKnight, M. & Peet, M. (2000) Health care providers' information seeking: recent research. *Medical Reference Services Quarterly*, **19**(2), 27-50.
- Meijers, J.M.M., Janssen, M.A.P., Cummings, G.G., Wallin, L., Estabrooks, C.A. & Halfens, R.Y.G. (2006) Assessing the relationships between contextual factors and research utilization in nursing: systematic literature review. *Journal of Advanced Nursing*, **55**(5), 622-35.
- Miles, M.B. & Huberman, A.M. (1994) *Qualitative data analysis: An expanded sourcebook*, Sage, Thousand Oaks.
- Morgan, D.L. & Krueger, R.A. (1993) When to use focus groups and why. In Morgan, D. L. (ed.) *Successful focus groups: Advancing the state of the art*, Sage Publications, Newbury Park, California.
- Morgan, D.L. & Spanish, M.T. (1984) Focus groups: A new tool for qualitative research. *Qualitative Sociology*, **7**(3), 253-270.
- Mullavey-O'Byrne, C. & West, S. (2001) Practising without certainty: providing health care in an uncertain world, In Higgs, J. & Titchen, A. (eds.) *Professional practice in Health, Education and the Creative Arts*. Blackwell Science, Oxford.
- Newell, A. & Simon, H.A. (1972) *Human problem solving*, Prentice-Hall, Englewood Cliffs, New Jersey.
- Newhouse, R.P. (2007) Creating infrastructure supportive of evidence-based nursing practice: leadership strategies. *Worldviews on Evidence-Based Nursing*, **4**(1), 21-29.
- NSW Health Funding Systems and Policy Branch. (2000) NSW Cost of Care Standards 2000/01. New South Wales Health, North Sydney.
- O'Brien, B. & Pearson, A. (1993) Unwritten knowledge in nursing: consider the spoken as well as the written word. *Scholarly Inquiry for Nursing Practice*, **7**(2), 111-124.
- O'Connor, G.T., Quinton, H.B. & Traven, N.D. (1999) Geographic variation in the treatment of acute myocardial infarction. *JAMA*, **281**(7), 627-633.
- Olade, R.A. (2003) Attitudes and factors affecting research utilization. *Nursing Forum*, **38**(4), 5-15.

- Payne, J.W. (1994) Thinking aloud: Insights into information processing. *Psychological Science*, **5**(5), 241-248.
- Pelzer, N.L. & Leysen, J.M. (1991) Use of information resources by veterinary practitioners. *Bulletin of the Medical Library Association*, **79**(1), 10-16.
- Persenious, M.W., Larsson, B.W. & Hall-Lord, M.L. (2006) Enteral nutrition in intensive care Nurses' perceptions and bedside observations. *Intensive & Critical Care Nursing*, **22**(2), 82-94.
- Peters, R.G., Covello, V.T. & McCallum, D.B. (1997) The determinants of trust and credibility in environmental risk communication: an empirical study. *Risk Analysis*, **17**(43-54).
- Platt, J. (1992) "Case Study" in American methodological thought. *Current Sociology*, **40**, 17-48.
- Powell, R.A. & Single, H.M. (1996) Focus groups. *International Journal for Quality in Health Care*, **8**(5), 499-504.
- Profetto-McGrath, J., Bulmer Smith, K., Hugo, K., Taylor, M. & El-Hajj, H. (2007) Clinical nurse specialists' use of evidence in practice: a pilot study. *Worldviews on Evidence-Based Nursing*, **4**(2), 86-96.
- Reid, T. (1997) *Inquiry into the human mind, on the principles of common sense*, Brookes, D. R. (ed.), Edinburgh University Press, Edinburgh.
- Robinson, N. (1999) The use of focus group methodology with selected examples from sexual health research. *Journal of Advanced Nursing* **29**, 905-913.
- Rowan, J. (1981) A dialectical paradigm for research. In Reason, P. and Rowan, J. (eds.) *Human inquiry: A sourcebook of new paradigm research*, John Wiley, New York.
- Schien, E.H. (2004) *Organizational culture and leadership*, Jossey-Bass, San Francisco.
- Schmolck, P. (2002) PQMethod. Statistical software available online <http://www.lrz-muenchen.de/~schmolck/qmethod/>
- Scott, S.D., Estabrooks, C.A., Allen, M., & Pollock, C. (2008) A context of uncertainty: How context shapes nurses' research utilization behaviours. *Qualitative Health Research* **18**(3), 347-357.
- Scott-Findlay, S. & Estabrooks, C.A. (2006) Mapping the organizational culture research in nursing: a literature review. *Journal of Advanced Nursing*, **56**(5), 498-513.

- Scott-Findlay, S. & Golden-Biddle, K. (2005) Understanding how organizational culture shapes research use. *Journal of Nursing Administration*, **35**(7/8), 359-365.
- Secco, M.L., Woodgate, R.L., Hodgson, A., Kowalski, S., Plouffe, J., Rothney, P.R., Sawatzky-Dickson, D. & Suderman, E. (2006) A survey study of pediatric nurses' use of information sources. *CIN: Computers, Informatics, Nursing*, **24**(2), 105-12.
- Sharit, J., Czaja, S.J., Augenstein, J.S., Balasubramanian, G. & Schell, V. (2006) Assessing the information environment in intensive care units. *Behaviour & Information Technology*, **25**(3), 207-20.
- Shiffman, R.N., Dixon, J., Brandt, C., Essaihi, A., Hsiao, A., Michel, G. & O'Connell, R. (2005) The GuideLine Implementability Appraisal (GLIA): Development and validation of an instrument to identify obstacles to guideline implementation. *BMC Medical Informatics and Decision Making*, **5**, 23.
- Sim, J. (1998) Collecting and analysing qualitative data: issues raised by the focus group. *Journal of Advanced Nursing*, **28**(2), 345-352.
- Spath, M. & Buttlar, L. (1996) Information and research needs of acute-care clinical nurses. *Bulletin of the Medical Library Association*, **84**(1), 112-116.
- Squires, J.E., Moralejo, D. & Lefort, S.M. (2007) Exploring the role of organizational policies and procedures in promoting research utilization in registered nurses. *Implementation Science*, **5**(2), 17.
- Stake, R.E. (1978) The case study method in social inquiry. *Educational Researcher*, **7** February, 5-8.
- Stake, R.E. (1995) *The Art of Case Study Research*, Sage Publications, Thousand Oaks.
- Stake, R.E. (2006) *Multiple case study analysis*, The Guilford Press, New York.
- Stenmark, D. (2002) Information vs knowledge: The role of intranets in knowledge management. Paper presented at the *35th Hawaii International Conference on System Sciences*, Hawaii, USA.
- Stevens, P.E. (1996) Focus groups: collecting aggregate-level data to understand community health phenomena. *Public Health Nursing*, **13**, 170-176.
- Stewart, D.W. & Shamdasani, P.N. (1990) *Focus groups: Theory and practice*, Sage Publications, Newbury Park, California.

- Stone, A., Russell, R. & Patterson, K. (2004) Transformational versus servant leadership: A difference in leader focus. *Leadership & Organisational Development Journal*, **25**(4), 349-361.
- Strong, J., Ashton, R., Chant, D. & Cramond, T. (1994) An investigation of the dimensions of chronic low back pain: the patients' perspectives. *British Journal of Occupational Therapy*, **57**, 204-208.
- Tannery, N.H., Wessel, C.B., Epstein, B.A. & Gadd, C.S. (2007) Hospital nurses' use of knowledge-based information resources. *Nursing Outlook*, **55**(1), 15-19.
- Tavakoli, M., Davis, H.T.O., & Thomson, R. (2000) Decision analysis in evidence-based decision making. *Journal of Evaluation in Clinical Practice*, **6**(2), 111-120.
- Tenopir, C., King, D.W. & Bush, A. (2004) Medical faculty's use of print and electronic journals: changes over time and in comparison with scientists. *Journal of the Medical Library Association*, **92**(2), 233-241.
- Thomas, D.R. (2006) An inductive approach for analyzing qualitative evaluation data. *American Journal of Evaluation*, **27**(2), 237-246.
- Thompson, C., Cullum, N., McCaughan, D., Sheldon, T.A., Raynor, P. (2008) Nurses, information use, and clinical decision-making: The real-world potential for Evidence-based decisions in nursing, In Cullum, N., Ciliska, D., Haynes, R.B., & Marks, S. (eds). *Evidenced-based Nursing: An introduction*, Blackwell Publishing, Oxford.
- Thompson, C. & Dowding, D. (2001) Responding to uncertainty in nursing practice. *International Journal of Nursing Studies*, **38**, 609-615.
- Thompson, C., McCaughan, D., Cullum, N., Sheldon, T., Mulhall, A. & Thompson, D. (2001a) The accessibility of research-based knowledge for nurses in United Kingdom acute care settings. *Journal of Advanced Nursing*, **36**(1), 11-22.
- Thompson, C., McCaughan, D., Cullum, N., Sheldon, T., Thompson, D. & Mulhall, A. (2001b) Nurses' Use Of Research Information In Clinical Decision Making: A Descriptive And Analytical Study. Final Report. NCC SDO, London, pp. 201.
- Thompson, C., McCaughan, D., Cullum, N., Sheldon, T.A., Mulhall, A. & Thompson, D.R. (2001c) Research information in nurses' clinical decision-making: what is useful? *Journal of Advanced Nursing*, **36**(3), 376-388.
- Thompson, C.J. (2001) The meaning of research utilization: A preliminary typology. *Critical Care Nursing Clinics of North America*, **13**(4), 475-485.

- Thompson, D.S., O'Leary, K., Scott-Findlay, S., O'Brien-Pallas, L., & Estabrooks, C.A. (2008) The relationship between busyness and research utilization: it is about time. *Journal of Clinical Nursing* **17**, 539-548.
- Thompson, M.L. (1997) Characteristics of information resources preferred by primary care physicians. *Bulletin of the Medical Library Association*, **85**(2), 187-192.
- Thornley, T. (2007) Discovering the expert: a grounded theory of registered nurses. Doctor of Philosophy Thesis, The University of Sydney, Sydney, NSW, Australia.
- Tranmer, J. (2005) Autonomy and decision-making in nursing. In Hall, L. M. (ed.) *Quality work environments for nurse and patient safety*, Jones & Bartlett Publishers, Sudbury, Massachusetts, pp. 139-162.
- Tyden, T. (1996) The contribution of longitudinal studies for understanding science communication and research utilization. *Science Communication*, **18**, 29-48.
- Urquhart, C. & Davies, R. (1997) Assessing the impact of information on evidence-based nursing practice: The EVINCE project. *Topics in Health Information Management*, **18**(2), 53-63.
- van Exel, J. & de Graff, G. (2005) Q methodology: a sneak preview. Available www.jobvanexel.nl. Accessed 12 March 2004.
- Varcoe, C. & Hilton, A. (1995) Factors affecting acute-care nurses' use of research findings. *Canadian Journal of Nursing Research*, **27**(4), 51-71.
- Veeramah, V. (2005) Utilization of research findings by graduate nurses and midwives. *Journal of Advanced Nursing*, **47**(2), 183-191.
- Verhoeven, A.A., Boerma, E.J. & Meyboom-de Jong, B. (1995) Use of information sources by family physicians: a literature survey. *Bulletin of the Medical Library Association*, **83**, 85-90.
- Wade, S.E. (1990) Using think alouds to assess comprehension. *The Reading Teacher*, **43**(7), 442-451.
- Wallin, L., Estabrooks, C.A., Midodzi, W.K. & Cummings, G.G. (2006) Development and validation of a derived measure of research utilization by nurses. *Nursing Research*, **55**(3), 149-60.
- Watts, S. & Stenner, P. (2005) Doing Q methodology: theory, method and interpretation. *Qualitative Research in Psychology*, **2**, 67-91.
- Webb, C. & Kevern, J. (2001) Focus groups as a research method: a critique of some aspects of their use in nursing research. *Journal of Advanced Nursing*, **33**(6), 798-805.

- Weinberg, A., Ullian, L., Richards, W. & Cooper, P. (1981) Informal advice- and information-seeking between physicians. *Journal of Medical Education*, **56**, 174-180.
- Westberg, E.E. & Miller, R.A. (1999) The basis for using the internet to support the information needs of primary care. *Journal of the American Informatics Association*, **6**, 6-24.
- Wilson, T.D. (1994) The proper protocol: Validity and completeness of verbal reports. *Psychological Science*, **5**(5), 249-251.
- Wilson, V., McCormack, B., & Ives, G. (2005) Understanding the workplace culture of a special care nursery. *Journal of Advanced Nursing*, **50**, 27-38.
- Yin, R.K. (1997) Case study evaluations: a decade of progress. *New Directions for Evaluation*, **76**, 69-78.
- Yin, R.K. (2003) *Case study research: Design and methods*, Sage, Thousand Oaks.
- Young, K.A. (2005) Direct from the source: the value of 'think-aloud' data in understanding learning. *Journal of Educational Enquiry*, **6**(1), 19-33.
- Young, M.P., Manning, H.L., Wilson, D.L., Mette, S.A., Riker, R.R., Leiter, J.C., Liu, S.K., Bates, J.T. & Parsons, P.E. (2004) Ventilation of patients with acute lung injury and acute respiratory distress syndrome: Has new evidence changed clinical practice? *Critical Care Medicine*, **32**(6), 1260-1265.
- Zucker, D.M. (2001) Using case study methodology in nursing research. *The Qualitative Report*, **6**(2), 1-12.

APPENDICES

Appendix 1 Enteral feeding in the critically ill: Are nursing practices contributing to hypocaloric feeding?

Appendix 2 Ethics approval

Human Research Ethics Committee



The University of Sydney

www.usyd.edu.au/ethics/human

Human Secretariat

Telephone: (02) 9036 9309
(02) 9036 9308
(02) 9351 4474
Facsimile: (02) 9036 9310
Email: r.todd@reschols.usyd.edu.au

12 July 2005

Associate Professor S West
Faculty of Nursing & Midwifery
Room A4.25, 88 Mallett Street
Mallett Street Campus – M02
The University of Sydney

Dear Professor West

Title: Factors affecting critical care nurses' adoption of evidence-based approaches to practice: enteral feeding as an exemplar

Doctor of Philosophy Student: Ms Andrea Marshall

Reference No.: 8404

Your recent application and Ms A Marshall's correspondence of 7 July 2005 has been noted by the Executive Committee of the Human Research Ethics Committee and in doing so accepts the final approval dated 31 May 2005 from the Northern Sydney Health Human Research Ethics Committee.

In considering the ethical content of the study, the Committee acknowledges the right for you to proceed under the authority of the Northern Sydney Health Human Research Ethics Committee.

It is the responsibility of the Chief Investigator to provide a progress report every twelve months for the duration of the study and a final report on the completion of the study. Your report will be due on 31 July 2006.

The responsibility for complaints by participants about the research process will remain with the Northern Sydney Health Human Research Ethics Committee.

Yours sincerely

Gail Briody
Manager, Ethics Administration

cc: Ms Andrea Marshall, Critical Care Nursing Professorial Unit, Level 6, Royal North Shore Hospital, E25

Appendix 3 Retrospective probing interview schedule

1. Decision making about patient care (specifically enteral feeding).
2. Explore what those decisions are based on?
3. Accessing information to help with decisions. Is this done regularly? What type of information is accessed and from where?
4. Provide a description of how information would be accessed.
5. Describe of any articles recently read.
6. Describe a change in practice in relation to information read or heard about.
7. Do some nurses need more information than others?
8. Describe the information available to you in your unit.
9. What are the most common sources of information used in your decision making?
10. Do you use some sources more than others?
11. Comment about the hospital library, ease of use and finding the information needed there.
12. Comment about the hospital intranet, including the ease of use and finding usefulness in finding information.
13. Comment on the use of colleagues as sources of information (formally or informally).
14. Comment on contact with research specialists.
15. Are there policies or protocols available in the workplace? Describe how these are developed and used? Are they useful in your clinical practice?
16. Describe the routine use of research findings by nurses.
17. Are there problems with nurses trying to implement research findings?
18. Comment on the ease of accessing research information to assist you in making decisions about your practice. Describe any problems.
19. Describe your involvement in practice change based on research findings.

Appendix 4 Case site 1 Q sample

Clinical Nurse Consultant	Internet	ICU homepage
Clinical Nurse Specialist	Intensivist	Hospital clinical policies, practices and guidelines (e)
More experienced RN	ICU staff meeting minutes	ICU protocol (e)
Less experienced RN	Notes from university course	ICU protocol (h)
RN with same level of experience	Personal experience	Textbook (e)
Intern	Patient notes	Journal article - Case study (e)
Resident Medical Officer	NSW Health memo	Inservice information
Registrar	Intranet	Pre-registration course notes
Senior Registrar	Nursing Unit Manager	Team Leader
Intensivist	ICU Department meeting minutes	Professional organisation website
Dietician	ICCMU Newsletter	Library services (hospital)
Professor of Critical Care Nursing	NSW Health Media release	Library services (university)
Research Nurse	Health Service General Circular	Conference information
Clinical Nurse Educator	Critical care competencies (h)	Journal article - Clinical practice guidelines (e)
Health Service Policy Manual	Critical care competencies (e)	Journal article – literature review (e)
ICU guidelines	Infection control policy and procedure manual	Abbreviated policy at bedside
Product information	MIMS	Textbook (h)
Journal article (e)	Poster (clinician authored)	Bedside algorithm
Poster (corporate author)		

e=electronic

h=hardcopy

Other abbreviations listed on p. xiv

Appendix 5 Case site 2 Q sample

Clinical Nurse Consultant	Internet	Another hospital ICU protocol (e)
Clinical Nurse Specialist	Intensivist	Textbook (e)
More experienced RN	Post registration course notes	Journal article - Case study (e)
Less experienced RN	Personal experience	In-service information
RN with same level of experience	Intranet	Pre-registration education
Resident Medical Officer	Nursing Unit Manager	Library services (hospital)
Registrar	Infection control policy and procedure manual	Journal article - Clinical practice guidelines (e)
Intensivist	MIMS	Journal article – literature review (h)
Dietician	Poster (clinician authored)	Textbook (h)
Clinical Nurse Educator	Textbook (e)	Conference abstracts
Product information	Learning resources	College of Nursing course materials
Journal article – research (e)	Clinical Information Access Project	Handover
RMO's handbook	Cochrane database	Briggs Institute Website
ICU drug manual	ICU orientation package	Journal article – systematic review (e)
CINAHL/medline	Videos	Other hospital ICU website
ICU policy manual (h)	Library services (other hospital) (e)	Journal article – literature review (e)
ICU staff at another hospital	Journal article – systematic review (h)	Journal article – Clinical practice guideline (h)
Another hospital Policies, procedures (e)	Pharmacy guidelines	Journal article – case study (h)
Hospital RN (outside ICU)	Poster (corporate author)	

e=electronic

h=hardcopy

Other abbreviations listed on p. xiv

Appendix 6 Instructions for completing usefulness Q sort

1. Please read all instructions carefully before beginning.
2. Please complete the demographic data form.
3. Read the following case scenario carefully and refer back to this as needed.

You are looking after a 45 year-old male who was admitted to the ICU following a Motor Vehicle Accident in which he sustained multiple long bone fractures and chest trauma. The patient has been fluid resuscitated and is currently receiving inotropic agents for haemodynamic support. Enteral feeding was commenced at 30 ml/hr with instructions to increase the rate of feeding to a maximum of 100 ml/hr as tolerated. The patient's current rate of feeding is 80 ml/hr and the most recent gastric residual volume is 275 ml. You refer to the recently introduced enteral feeding protocol and note that a gastric residual volume over 200 mls is considered high. You discuss this with a colleague who describes other ICUs using different cut off points for high gastric residual volumes. You both agree that there is some inconsistency in how a high gastric residual volume is defined and wonder about this variability in practice.

4. Open the bag containing the labels. Place all labels with the text up. Each label has a source of information that could be accessed to provide you with information regarding the above scenario. Read through each of these labels so that you are familiar with what is written on them.
5. Sort the following sources of information according to those which you feel are most **useful** through to those which are least **useful** in helping to inform your practice. It may help to first group the labels into two piles; a pile for those which you think are **useful** and a pile for those that you think are not **useful**.
6. Sort the '**useful** labels according to those which you think are most **useful**. Place the most **useful** source of information on the top box on the paper guide.
7. Continue to sort through the sources of information so that you have roughly placed all 56 labels on the paper guide and so that they follow a pattern from most **useful** (at the top of the page) to least **useful** (at the bottom of the page).

8. Once you have placed all labels on the paper guide, review and make any changes you think necessary to accurately reflect your opinion of how **useful** you think these sources of information would be in with reference to the above scenario.
9. When you are happy with the order of your labels, remove the backing and stick the label into place.
10. Place the paper guide, together with the consent, demographic data sheet and other Q sort, and return by post in the pre-paid envelope provided.

Appendix 7 Instructions for completing accessibility Q sort

1. Please read all instructions carefully before beginning.
2. Please complete the demographic data form.
3. Reflect on a situation where you were faced with a situation you were uncertain about. This may be in relation to enteral feeding or, if you cannot recall a situation of uncertainty related to enteral feeding, another clinical situation where you felt you needed further information to aid your clinical decision making. Think about what sources of information would be most **accessible** to you in helping to resolve your uncertainty.
4. Open the bag containing the labels. Place all labels with the text up. Each label has a source of information that could be accessed to provide you with information regarding the above scenario. Read through each of these labels so that you are familiar with what is written on them.
5. Sort the following sources of information according to those which you feel are most **accessible** through to those which are least **accessible** in helping to inform your practice. It may help to first group the labels into two piles: a pile for those which you think are **accessible** and a pile for those that you think are not **accessible**.
6. Sort the '**accessible**' labels according to those which you think are most **accessible**. Place the most **accessible** source of information on the top box on the paper guide.
7. Continue to sort through the sources of information so that you have roughly placed all 56 labels on the paper guide and so that they follow a pattern from most **accessible** (at the top of the page) to least **accessible** (at the bottom of the page).
8. Once you have placed all labels on the paper guide, review and make any changes you think necessary to accurately reflect your opinion of how **accessible** you think these sources of information would be in with reference to the above scenario.
9. When you are happy with the order of your labels, remove the backing and stick the label into place.
10. Place the paper guide, together with the consent, demographic data sheet and other Q sort, in the pre-paid envelope provided and place in a post box.

Appendix 8 Merged findings from cross-case synthesis

Merged findings were identified following a procedure for cross-case synthesis as outlined in Chapter 3 (p. 52). Initially data from each case site were individually analysed and case-specific findings were identified. For each case site case specific findings were able to be categorised under the themes of making decisions, information sources used to support clinical decisions, the veracity of information and the nature of inquiry. At case site 2 an additional finding of workplace culture and information use was identified. Before cross-case analysis could be undertaken key findings were written as statements. These statements were then analysed with those that were similar being grouped and identified as a merged finding. Statements pertaining to each merged finding are listed below and grouped by case site to illustrate each case site's contribution to the merged theme.

Merged finding 1 – Natural testimony

Preferential use of verbal testimony

- People are the most preferred source of information (case site 1)
- People are considered most useful (case site 1)
- Using people as a sole source of information could be problematic (case site 1)
- Safe practice is more important than knowledge transfer in experienced nurses (case site 1)
- People were the preferred source of information (case site 2)
- People were considered the most useful and accessible sources of information (case site 2)

Evaluating verbal testimony – source credibility

- With continued uncertainty nurses move up the hierarchy of people to obtain additional information (case site 1)
- Variability in credibility exists within positions of authority (case site 1)
- Those with less experience find it more difficult to assess an individual's credibility (case site 1)
- There can be discrepancies between nurses and individual's views of credibility (case site 1)

- The expertise of others is relied on to assist with decision making (case site 1)
- Trust and approachability of another was important when using them as information (case site 1)
- Experience is an important characteristic when determining who to ask (case site 1)
- Experience and position are important in determining credible information sources (case site 1)
- Nurses use a hierarchical approach when seeking information (case site 2)
- Nurses who were considered 'good' practitioners were often sought to help resolve clinical uncertainty (case site 2)
- No clear criteria were used for determining qualities of an 'authoritative' source other than experience or position (case site 2)

Evaluating verbal testimony – veracity of information obtained

- The expertise of others is relied on to assist with decision making (case site 1)
- Those in non-clinical roles were not seen as authoritative despite level of knowledge (case site 1)
- Not all people in a similar position were viewed equally as good information sources (case site 1)
- Plausibility considered more in giving than in receiving information (case site 1)
- Corroborated information had a greater perceived utility (case site 1)
- Strategies to corroborate information were initiated when uncertainty persisted (case site 1)
- Skill deficits influence ability to evaluate information (case site 1)
- Nurses want accurate information but don't always consider the veracity of information (case site 1)
- Nurses want information quickly and easily even if information isn't as accurate (case site 1)
- Some nurses valued a plausible rationale for practice (case site 2)
- Nurses provided a rationale for their decisions (case site 2)
- Nurses looked for corroboration but when discrepancies arose this led to increased uncertainty (case site 2)
- Position (Clinical Nurse Specialist) associated with authority – but some you can't trust (case site 2)
- The more experienced someone is the more authoritative the information (case site 2)

- Clinical nurses assume information provided by the organisation was research based (case site 2)
- Nurses don't know if policy documents reflect best practice (case site 2)
- Development processes for policies contributed to uncertainty about the authority of these documents as information sources (case site 2)

Merged finding 2 – Inquiry in nursing practice

Approaches to work

- Nurses want to acquire information passively (case site 1)
- Inquiry for clinical nurses, should only happen during paid work hours (case site 1)
- Letting someone else make the decisions was safer (case site 2)
- Decision making deferred if nurses didn't want to take responsibility for decisions (case site 2)
- Seeking information for practice should be done in paid work hours (case site 2)
- Nurses didn't actively question practice or seek information (other than to resolve immediate clinical issues (case site 2)

Inquiry in the workplace

- Safe practice is more important than knowledge transfer in experienced nurses (1)
- Nurses infrequently made independent decisions (1)
- Independent decisions may not have been made because of fear of 'getting it wrong' (1)
- Critical dialogue may need to be role-modelled (case site 1)
- Nurses want to acquire information passively (1)
- Nurses must earn the right to be able to make independent decisions (case site 1)
- Decisions made by nurses are heavily scrutinised; scrutiny associated with risk minimisation (1)
- Uncertainty in practice isn't viewed as an opportunity for critical dialogue (case site 1)
- Inquiry primarily for immediate resolution of problem rather than to develop an understanding (case site 1)
- More experienced nurses consider information acquisition more strategically (case site 1)

- Inexperienced nurses need to survive in the clinical environment so don't consider anything beyond safe practice (case site 1)
- Absence of critical dialogue may be because of skill base or unwillingness to own criticism (case site 1)
- Developing a culture of inquiry was an aim of senior clinical nurses (case site 1)
- Nurses didn't question doctor's orders (case site 2)
- Doctors were equivocal in terms of how they viewed nurses independent decision making (case site 2)
- Letting someone else make the decisions was safer (case site 2)
- Some nurses were comfortable with making independent decisions (case site 2)
- Decision making deferred if nurses didn't want to take responsibility for decisions (case site 2)
- Decision making deferred when uncertainty was present (case site 2)
- Few nurses wanted information about their practice in general (case site 2)
- Lack of critical inquiry may be related to a lack of clinical leadership (case site 2)
- More experienced nurses were considered to have requisite knowledge for practice (case site 2)
- Nurses didn't actively question practice or seek information (other than to resolve immediate clinical issues (case site 2)
- Tension between developing independence in clinical nurses and 'leading' clinical nurses was evident amongst senior nurse clinicians (case site 2)
- Lack of protocols contributed to a higher degree of critical thought (case site 2)
- Many nurses lacked knowledge and skill in reading and implementing research findings (case site 2)

Clinical leadership

- Critical dialogue may need to be role-modelled (case site 1)
- NUM obstructed change when suggested by others (case site 2)
- Poor communication between management and bedside nurses (case site 2)
- Clinical leadership attributes were lacking in more senior nurses (case site 2)
- Nursing staff within the ICU are unwilling to embrace change (case site 2)
- Nurses described as 'lazy' and 'complacent' (case site 2)
- Those who suggest change is necessary are punished (case site 2)

- Lack of critical inquiry may be related to a lack of clinical leadership (case site 2)

Clinical governance

- Apprehension about practicing outside the norm of established practice (case site 1)
- Independent decisions may not have been made because of fear of ‘getting it wrong’ (case site 1)
- Conformity to established practice was more important than considering individual patient need (case site 1)
- Nurses trust but don’t critique institution-based textual information (case site 1)
- Nurses weren’t proactive in promoting treatment but implemented doctor’s orders (case site 1)
- Some nurses were happy to work outside norms of practice for good reasons (case site 2)
- Perceived boundary for where independent decision making was allowed and many nurses didn’t want to overstep that boundary – need to practice within unit’s norm (case site 2)
- Variability in decisions likely because there was no protocol to guide practice (case site 2)
- Policy documents weren’t highlighted as an important source but were associated with ‘safe’ practice (case site 2)
- Making research-base of policies more transparent wasn’t considered useful because nurse either didn’t trust the opinion of the person reviewing the research or didn’t understand what levels of evidence/grades of recommendations were (case site 2)
- Lack of protocols contributed to a higher degree of critical thought (case site 2)

Merged finding 3 – Usefulness of information

- Print and electronic information sources considered not accessible because they took more time (case site 1)
- Published, peer-reviewed information rates poorly in terms of accessibility and usefulness (case site 1)
- Perspective 2 (2 participants) considered usefulness outside the context of accessibility and more published sources of information were considered useful (case site 1)

- Few print based information sources are considered useful (case site 1)
- Useful of electronic sources of information is equivocal (case site 1)
- Being able to easily locate information was important (case site 1)
- Nurses value the use of research in practice (case site 1)
- Many nurses are unable to effectively use research as information (1)
- The volume of research information is prohibitive (case site 1)
- The majority considered useful information as either people or pre-appraised information (case site 1)
- Pre-appraised information is valued (case site 1)
- Nurses want to use research in practice but by proxy (case site 1)
- Use of pre-appraised information was associated with safe practice (case site 1)
- Research is viewed as the published study. Recognition of using research in practice through proxy wasn't identified as happening but it was (case site 1)
- People are considered most useful (case site 1)
- People are considered most accessible (case site 1)
- Credibility of published information based on journal reputation (case site 1)
- Large amounts of print-based material, largely outdated, was not acknowledged by staff as a source of information (case site 2)
- Development processes for policies contributed to uncertainty about the authority of these documents as information sources (case site 2)
- Access to print-based information sources was seen as the individual nurses' responsibility (case site 2)
- Improving IT resources the only way to improve available information (case site 2)
- Policy documents weren't highlighted as an important source but were associated with 'safe' practice (case site 2)
- Policies relied on only when a person couldn't provide the information required (case site 2)
- People were considered the most useful and accessible sources of information (case site 2)
- Clinical nurses said they valued the idea of research-based practice but didn't implement it, even when that information was made available (case site 2)
- Being able to use research to inform practice was not considered necessary by either clinical nurses or senior clinical nurses (case site 2)
- Making research-base of policies more transparent wasn't considered useful because nurse either didn't trust the opinion of the person reviewing

the research or didn't understand what levels of evidence/grades of recommendations were (case site 2)

- Electronic media rated very poorly because access was significantly limited (case site 2)
- Time was a barrier to using resources other than people (case site 2)