

**Decision-Making in Acute Care
Nursing with Deteriorating
Patients**

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ABSTRACT

Concerns have been well documented about deteriorating patients being missed and that care has not been of a sufficient standard to maintain their safety. This 'failure to rescue' remains despite changes in training and critical care experts working with ward staff. Little is known about what influences decision-making at the point a patient deteriorates and prior to referring on to an expert.

The aim of this study was to understand how nurses reach their clinical decisions while caring for a deteriorating patient and to identify the contextual factors that influence that decision-making process. Using grounded theory methodology the study comprised fieldwork, semi-structured interviews and a focus group; participants were 22 nurses and 2 physiotherapists working in general medical and surgical wards.

A pragmatist philosophical tradition informing symbolic interaction guided the interpretive analytical framework of the study. The simultaneous collection, memoing, dimensional analysis of the data and constant comparison of the findings with the body of literature, built an emerging theory of clinical reasoning in acute care situations.

Findings suggested that acute care nurses practice in one of 3 modes. They are:

- 'Ward routine', where normal ward work takes place and nurses use protocols to deliver care.
- 'Crescendo of care' where searching, information gathering, checking findings and efforts to gain control over the clinical situation took place. Nurses' reasoning in this mode was abductive and focused on building a believable case prior to referral.
- 'Management of crisis' where the nurse was sure of their concerns, made the referral and continues to seek to confirm concerns.

Through the three modes nurses reasoned and made sense of the clinical information they picked up. They spent time marshalling this data until it served them a believable credible case with which to refer to another professional. This involved negotiating and bargaining to elicit action. The goals in these actions and interactions were to keep the patient and themselves safe. This was underpinned and motivated by their personal and professional beliefs. Throughout the whole decision-making process nurses accounted for every decision and judgement they made until they were convinced and confident in what they believed was happening. Then they made a referral to a more senior professional. This was conceptualised as the theory of mind accounting in clinical reasoning which emerged as the explanation for how nurses clinically reason and make decisions when caring for a patient whose condition is declining.

The emerging theory offers an alternative explanation of the way nurses assess and intervene when concerned about a patient. This is significant because timely accurate decision-making is fundamental to providing quality care.

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“There must be a beginning of any great matter, but the continuing unto the end until it be thoroughly finished yields the true glory”

(Francis Drake 1587)

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Declaration

I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree, and does not incorporate any material already submitted for a degree.

Signed.....

Dated.....

CHAPTER 1

1.1 Introduction

A 47 year old father of two enters the Accident and Emergency Department (A&E) at 10 am and dies 24 hours later in the Intensive Care Unit (ICU). The factors that contributed to his untimely death are a failure to promptly recognise his deteriorating condition, delays in getting a medical review, procrastination before instigating treatment and a passive reaction to his final collapse (Surviving Sepsis Campaign 2006). This patient's story is not an isolated event.

Concerns have been well documented over the past twenty years or more about how declining patients are being overlooked and how their care has not been of a sufficient standard to maintain their safety (Schein et al 1990, Bedell et al 1991, Allan et al 1994, Hillman et al 1996, Chaplik and Neafsey 1998, Goldhill and Sumner 1998, McQuillan et al 1998, Audit Commission 1999, McGloin et al 1999, Department of Health (DH) 2000, National Confidential Enquiry into Patient Outcome and Death (NCEPOD) 2005, National Institute for Health and Clinical Excellence (NICE) 2007, National Patient Safety Agency (NPSA) 2007, Rattray et al 2011, Patient Safety First 2012).

This study originated from my own concerns as a critical care practitioner working alongside ward staff. I had witnessed how patients were often 'found by chance' when I was visiting and assessing others on the ward. Sometimes it transpired that these patients had been deteriorating for days. Staff of all disciplines appeared not to have taken appropriate action to address the unfolding clinical picture. Nurses made decisions, in response to their concerns about a patient's condition, which resulted in delayed or deferred referral to appropriate experts (McQuillan et al 1998). Ostensibly, this is despite the many improvements and additional support in place within the wards including critical care specialists to assist staff with this aspect of their workload (DH 2000, 2001, 2005).

I wanted to understand what happens when nurses are caring for acutely unwell patients in the ward environment before they call for help. This is a complex environment that comprises many different professionals. Each one of these people approaches the acute care world from their own perspective, bringing with them their own knowledge, experience and subjectivity. Exploring how this interaction impacts on a nurse's clinical reasoning process may illuminate how the care of the seriously unwell patient can be improved and the steps needed to achieve this.

This chapter presents the background literature in order to illuminate what is known and understood about caring for the acutely unwell. The objective was to undertake a systematic search of relevant literature to provide the context of the research problem. Specific aims were to:

- Explore what is known about the problem and the extent of it from an empirical knowledge perspective
- Identify areas in the scientific knowledge of poor ward care of the deteriorating patient
- Illuminate the factors that influence the on-going issue and explain why it remains a contemporary problem
- Raise questions where little evidence exists.

Using the search framework described by Hart (2001), a topic-based inquiry was made using the key words 'suboptimal care' and 'critical care outreach' since 1980. Literature prior to 1980 was excluded because outcomes, treatment and the general nature of critical care and patient case mix have changed to such an extent that the literature would have very little relevance (Hayes et al 2000). Inclusion criteria were that the papers:

- Were written in English
- Related to outcome measures such as mortality and quality of care
- Related to an episode of critical illness
- Focused on caring for the critically ill patient in non-critical care areas.

There was no limitation on the type of study design to be identified in the search. This was to gather as much initial material as possible. Online databases were searched (Chapter 2 section 2.2 describes the detailed strategy). Grey literature was sought yielding one thesis pertaining to this topic. A journal search was made from the most commonly cited journals, predominantly in the field of critical care, and an author search of the most frequently cited authors. Due to the political nature of the issue DH documents were sought. Cross referencing from existing publications yielded letters, editorials, local audit projects and evaluations of local initiatives that clinicians were hoping would improve the quality of care of the critically ill patient.

At the outset, I used this initial review to ask questions of the current body of knowledge to develop the research question. I used it to theoretically sensitise me to the decision-making phenomenon. This enabled me to be clear about the study's purpose and significance. Indeed this preliminary review enhanced theoretical sensitivity as dimensions were developed and compared and patterns sought. It also allowed me to reflexively manage and acknowledge that I did not enter the field with a blank view (Birks and Mills 2011).

1.2 Contextual Background

From the 1990s to date studies investigating the care of the critically ill ward patient highlighted the late recognition of ward patients whose condition was deteriorating, and the subsequent delay in enlisting appropriate treatment and management culminating in high death rates within the ICU. This led ICU and resuscitation specialists to focus on the care management of patients who were becoming critically ill in the general wards. Authors discussed the large number of patients admitted who had required cardiopulmonary resuscitation (CPR) on the ward prior to ICU admission, and that the longer the patients were in hospital prior to critical care intervention, the higher their hospital mortality (Schein et al 1990, Hillman et al 1996, McQuillan et al 1998, Hillman

et al 2001, Goldhill and McNarry 2004). In the United Kingdom (UK) studies continued to be undertaken, with ICU bed shortages being publicised (Goldhill and Sumner 1998, Bright et al 2004, NCEPOD 2005, Esmonde et al 2006, NICE 2007, Ludikhuize et al 2012, Royal College of Physicians (RCP) 2012). Patients discharged from the ICU to the wards were also considered at risk and suffered high mortality rates if readmitted back to the ICU (Wallis et al 1997, Goldhill and Sumner 1998, Russell 1999, Rosenberg and Watts 2000, Daly et al 2001). The implications of these findings were that there appeared to be a gulf between ICU and ward quality of care. The problem seemed to relate to a failure to recognise acutely ill patients and to act urgently, appropriately and adequately, as in the case of the patient described above. This has been conceptualised into two broad categories which are lack of:

- i. Timely response (prompt recognition of the problem)
- ii. Appropriate response (correct management and treatment (Taenzer et al 2011).

The term 'suboptimal' has been used to describe this level of care of the acutely unwell ward patient (McQuillan et al 1998).

All the above studies involved case note reviews of cohorts of patients within specific hospitals, either those who had required CPR, or unplanned admissions to the ICU. Findings were similar in all, with critical events all being preceded by documented abnormalities in clinical stability and insufficient, or inappropriate action by clinicians (Franklin and Mathew 1994, Chaplik and Neafsey 1998, Goldhill and Sumner 1998, Buist et al 1999, Goldhill et al 1999, McGloin et al 1999, Rosenberg and Watts 2000). Not all these studies showed clearly why adequate management or referral did not take place. They were limited to recorded data only, and depended on the quality of the patient documentation. Suboptimal care necessitates definition (Intensive Care Society 2002), and the reviews needed to be carried out or validated by external reviewers blinded to patient outcomes. This filtered information could mean that the incidence of suboptimal management was greater than documented. There were various reasons for this: samples were

generally quite small, and although statistical significance was identified in many of the findings, authors did not state sample power analysis in any of the articles. Case note reviews are inherently subjective in their clinical evaluation, with the values used to determine abnormal physiology requiring validation. The studies referred to above were quantitative in nature and did not attempt to capture the social processes¹ that were occurring in the real world of the general ward. Nor did they consider how clinicians reached their decisions or what influenced their practice. This raised further questions about what shaped the actions and choices nurses and clinicians made at this time.

Many studies, for example Schein et al (1990), Hillman et al (1996), McQuillan et al (1998), cited changes in vital signs, particularly respiratory rates, as a key clinical indicator of deterioration. None of them defined vital sign parameters, thus making specificity and sensitivity difficult to assess, and therefore the relevance of these claims. Rationale for the frequency of vital sign recording was rarely based on scientific evidence and whether the measured vital signs were selected according to their sensitivity to deterioration (Bayne 1997, Fernandez and Griffiths 2005). The studies appeared to be a description of the problems with some practical solutions advised, but none of them prospectively examined the issues nor the proposed solutions.

The complex extraneous variables, such as ineffective multidisciplinary team working and inadequate care planning for the patient were not considered. These are factors that shape the ward culture and identity and may impact on patient care. Routines such as once daily ward rounds and vital sign recording practices were not reviewed. When vital sign recording is delegated to health care assistants they may not fully understand the relevance of the observations, or may take observations at set times in the day rather than according to patient need. The effect of the skillmix on the wards was not critiqued, nor the articulation of leadership styles and effectiveness of the

¹ By social process I mean the interactions that occur between people as they meet and develop social relationships. These social interactions form the social processes.

ward management structures. Team motivation, the ability of nursing staff to assess and interpret data and to *'think-in-action'* (Schön 2005) or reflect later and learn from critical incident analysis was not considered. None of the studies offered much comment on the contribution of nursing staff to the detection or prevention of clinical deterioration. It therefore appears timely to fully investigate how nurses make decisions and their approach to the care of patients whose conditions are declining. The factors that affect this have not been fully articulated in the literature. This gap in evidence demands a different approach; one where the social processes that are taking place in the clinical area are elucidated and the way nurses consider and make decisions about the care of their patients is explained. Table 1.1 overleaf, summarises the reasons for suboptimal care proposed by the current literature.

Ward nurses have a unique role as they provide a constant presence caring for the patients day and night, transferring that care between shifts. Other professions such as the medical and therapy staff only visit the ward to review and treat patients. Almost all of the cases examined in the literature related to critically ill patients who had required ICU intervention. None of the early publications studied acutely ill patients who remained on the ward: in current practice these are the greater in number, and are the ones whose failure to rescue by staff comprise the problem and consequently the subject of this research.

Table 1.1 Summary of the Reasons why Suboptimal Care Prevailed

- Sicker patients in ward areas
- Nursing and medical ward staff lacking critical care skills
- Late referrals to the ITU (Intensive Therapy Unit) and High Dependency Unit
- Poor outcomes in deteriorating patients in the ward areas
- Inability to detect deterioration despite documented clinical instability
- Apparent inability to act appropriately when such a patient is identified
- Failure to report deterioration or seek advice
- Inadequate care planning for the patient
- Poor vital sign recording
- Inability of staff to assess and interpret vital sign data
- Lack of supervision on the wards
- Poor leadership within the wards
- Excessive workloads

Table derived from: Schein et al 1990, Hillman et al 1996, Goldhill and Sumner 1998, McQuillan et al 1998, Audit Commission 1999, McGloin et al 1999, DH 2000, NCEPOD 2005, NICE 2007,

There appeared to be a paucity of evidence explaining what happens to these patients. Furthermore, these early studies failed to unravel the social processes taking place when caring for a patient who is acutely unwell. Retrospective note reviews are unable to reveal this information. All these studies therefore lacked an adequate explanation as to why staff appeared unable to recognise a deteriorating patient and why there was an apparent failure to act appropriately when such a patient was identified.

In summary, what is known is that patients become critically ill in the wards and healthcare workers seem to have difficulty in recognising deterioration despite undertaking observation of these patients. This poses the question why? Answering this question may lead to greater understanding of the problem, and may generate new insights that have the potential to improve the care quality of this group of patients. Attempts to address this issue have been made although the nature of the concern has been poorly defined (Quirke et al 2011). Structures have been designed to improve the quality of care for these patients. The next section discusses these initiatives and their implementation in relation to the research problem.

1.3 Initiatives to Improve the Care of the Acutely Unwell Patient

Previous initiatives have included providing critical care expertise in traditionally non-critical care areas (critical care outreach teams); introducing track and trigger systems that alert staff to deteriorating patients when they undertake their vital signs (Track and Trigger Scoring System, Appendix 1). Clinical guidelines and standards have been established. Competencies that all staff are expected to attain have been published (NICE 2007, DH 2009). There have been developments in education and training for doctors and nurses.

1.3.1 Critical Care Outreach Teams

Critical care nurses and doctors working as teams (critical care outreach teams) alongside ward staff to help them to recognise a patient who is becoming critically ill were introduced in many hospitals from 1999 following the recommendations in DH guidance (Audit Commission 1999, DH 2000, Higgs 2009). Their remit includes supporting ward staff with the correct interventions, treatment and care that are required to improve the patient's condition. This collaboration is intended to help identify patients whose condition is deteriorating earlier, and to ensure the correct management is provided at the right time (NICE 2007). The critical care outreach team extends critical care services beyond the confines of the ICU and High Dependency Unit (HDU) and functions as a clinical service and educational partnership between the ICUs, HDUs and wards (Athifa et al 2010). The team also supports the ward staff by following up those patients recently discharged from ICU or HDU, reviewing patients about whom the ward staff have clinical concerns and initiating appropriate interventions. They also have an education role in the classroom as well as at the bedside. However, they were introduced rather haphazardly and suddenly (Goldhill et al 1999a, Goldhill 2000); the DH funded critical care outreach teams with minimal prior evidence that they would improve outcomes. This led me to examine the

literature for evidence regarding the efficacy of outreach teams as a concept. I researched their role in improving the care of the deteriorating patient. This was particularly pertinent for me personally and professionally given my clinical role at that time as a critical care outreach nurse.

Researchers have attempted to evaluate the efficacy of critical care outreach teams (Bristow et al 2000, Parr et al 2001, Ball 2002, Buist et al 2002, Ball et al 2003, DOH 2003, Pittard 2003, Smith 2003, Subbe et al 2003, Ball 2004, Bellomo et al 2004, Priestly et al 2004, DOH 2005, Chellel et al 2006, Chan et al 2010, Elliott et al 2012). Again, the majority of the work involved retrospective note review. The veracity of such studies is dependent on the quality of the note keeping and retrospective clinical judgements. The studies were usually small and related to a specific hospital, its particular population and specialities rendering any generalisability questionable. However, some significant findings were published.

Studies carried out in Australia have shown some strong findings but even these remain equivocal. Bristow et al (2000) compared patient outcomes between three hospitals. They found a significantly reduced rate of unanticipated ICU/HDU admissions in the hospital where the critical care outreach team operated. There were no differences in the rates of cardiac arrests or deaths. The authors acknowledged that differences in the organisational and operational management styles of the hospitals may have contributed to their findings. The nature of the optimum organisational and management styles is still to be determined.

Goldhill et al (1999a) and Buist et al (2002) found a significant and strikingly lower requirement for CPR in ICU admissions who were seen by the critical care team than those who were not. Goldhill et al (1999a) acknowledged that the team probably only saw a proportion of patients in the hospital who could have benefitted from improved care. The impact of critical care outreach intervention on the unseen group remains unknown. The authors failed to consider, however, the statistical impact of the increased number of 'Do Not Resuscitate' (DNR) orders being issued since the commencement of the

initiatives. This, rather than the improved management of these patients, might be the independent variable.

Bellomo et al (2004) prospectively examined the effect of critical care outreach input on surgical patients in an Australian hospital over a 4-month period. Although this study demonstrated a significant reduction in surgical deaths, ICU unplanned admissions and hospital length of stay, it was not double blinded, placebo-controlled, nor randomised. Again, it was the findings of just one institution.

Benefits of the outreach teams have been cited as preventing the need for CPR, assisting in making decisions, such as DNR orders, for ward patients, furnishing prior knowledge of critically ill patients and providing expert assistance in organising and planning ICU admissions. More recently Moon et al (2011) undertook an eight year audit of the impact of critical care outreach and the introduction of track and trigger scoring in a UK Trust. Designed as two four-year sets of data, the second audit showed a significant decrease in the number of cardiac arrests in the hospital. The in-hospital mortality of those patients admitted to the ICU following cardiac arrest, and indeed the proportion of patients requiring ICU post cardiac arrest fell significantly since the introduction of the outreach teams and track and trigger scoring. Conversely, DeVita et al (The Medical Emergency Response Improvement Team (MERIT) Study 2004), again an Australian study, demonstrated no significant differences in cardiac arrests, unplanned ICU admissions and unexpected deaths, similar to Lee et al (1998). In fact, the MERIT Study showed that the hospitals without critical care outreach teams also demonstrated improvements in these outcomes similar to those designated as the intervention group. The question of how nurses make decisions when caring for sick patients still remained unanswered.

As authors attempted to evaluate the critical care outreach team's effect on outcomes, they failed to take into account the Hawthorne effect that may bias their work (Carberry 2002). Some staff may be more vigilant in the knowledge that their practice is being studied. In addition, the evaluation of the teams

can only take place if they are called. Daffurn et al (1994) concluded that nurses did not always recognise when to make the call. Concerns have also been raised about who should be intervening for the patients when the critical care outreach team has gone home. Studies have shown that up to 44% of calls are made between 20:00 and 08:00 (Smith 2000a), hence the political recommendation for 24-hour critical care outreach support (DH 2003, 2005, NCEPOD 2005).

Garrard and Young (1998) and Riley and Faleiro (2001) discuss the importance of the educative role of critical care outreach teams to develop ward-based skills. This facet of their role ensures a hospital wide approach that is integrated into the continuum of care and training at all levels of seniority and professions. The UK model of outreach varies, but most have introduced nurse-led teams, some headed up by a consultant nurse (Smith 2000a, Groom 2001, Groom et al 2001, Anderson et al 2002, Robson 2002, DH 2003). The UK is providing evidence similar to the work published abroad where critical care outreach teams are demonstrating a difference. For example, Ball et al (2003) showed a significant difference in readmissions of discharged patients from the ICU. However, their original readmission rate was much higher than the national average of 6%, which therefore raises questions about its validity. Smith (2003) found a significant decrease in mortality of patients transferred to the wards out of hours from the ICU, following two visits from a critical care nurse. This study was based on the assumption that these patients were transferred early due to pressure on ICU beds however participant numbers were very small and lacked sample power.

Many authors have attempted to evaluate the critical care outreach initiative. In 2007 the DH commissioned a national review of the effect of critical care outreach teams, but due to the variability of how teams are configured and the many confounding variables that exist in different Trusts around the country, they were unable to make comparisons and draw reliable conclusions regarding their efficacy (NICE 2007). However, it was felt that critical care outreach teams do no harm and provide useful support to ward teams with the care of these patients (Esmonde et al 2006). Results have been inconclusive

although encouraging in the UK as well as overseas (Athifa et al 2010). Improved communication pathways between critical care staff and ward staff, along with increased confidence and improved knowledge base have been reported as a result of critical care outreach team input (Endacott et al 2009, Athifa et al 2010). Again, the research focused on the critical care nurse intervention leaving any intervention or decision-making undertaken prior to their arrival by the ward nurse as an unknown phenomenon.

Despite the presence of critical care outreach teams, there still remain examples of declining patients being missed. It appears that we do not understand the root of the problem, including what nurses are thinking and considering before taking action when caring for a seriously ill patient. Very few of the evaluations of critical care outreach examined this aspect of the decision-making process, and used mostly a quantitative approach to evaluation. It is unclear which factors incite nurses to seek help from the outreach team and which factors present barriers to access. This led me to consider that a different approach was required to examine the phenomenon; an approach that explored the processes as they took place in the ward prior to the outreach team being called, and also one that explained how and when nurses decide to refer to the outreach team. One of the tools outreach teams use to evaluate referrals are scoring systems of the patient's vital signs. The next section discusses the use of such systems with deteriorating ward patients.

1.3.2 Physiological Track and Trigger Systems

Systems that alert staff to deteriorating patients when they undertake their vital signs have been widely implemented across hospitals in the UK and follow the recommendations set by NICE (2007). They are also known as modified early warning scores (MEWS) and patient at risk scores (PAR). A criticism levied at these tools is inconsistent implementation between hospitals (RCP 2012). They have proposed a national early warning score (NEWS) to be rolled out across the NHS. Although the tools do vary across the UK, they generally follow a similar format in that they offer a points system

that alerts the nurse noting the patient's observations when a physiological parameter moves beyond the normal range. The tool generally has a protocol for staff to follow dependent on the score registered by the vital sign recordings. If the score reaches a certain level, the patient is described as 'at risk' (of deterioration) and requires a set of interventions and actions to be undertaken as stated in the protocol. These tools are not based on empirical evidence around what is 'proven' to be the critical parameter for any particular sign or symptom (Subbe et al 2003), but they act as an adjunct to the clinical decision-making process in the wards and can afford opportunities for earlier more effective intervention (Rivers et al 2001, 2005, DeVita et al 2006, Mohammed et al 2009, RCP 2012).

Many authors have attempted to evaluate the impact of track and trigger systems (McArthur-Rouse 2001, Bright et al 2004, Odell et al 2009, Preston and Flynn 2010, Ludikhuizen et al 2012). Findings varied with authors reporting that the systems are sometimes not used (Oakey and Slade 2006, Johnstone et al 2007, Donohue and Endacott 2010); vital signs are not recorded; omissions and inaccuracies are prevalent (Oakey and Slade 2006, Higgins et al 2008, Subbe et al 2007); the score is incorrectly calculated (Smith 2008) or that they are viewed as yet another administrative task for busy staff to complete (Higgins et al 2008).

Critics of the track and trigger systems believe that they are flawed in a number of ways. Firstly, they do not take into account what is a normal individual physiological parameter. Secondly, the parameters are not based on empirical evidence and with low sensitivity having been derived from clinician knowledge and experience rather than scientific evidence. In practice, professional judgement is required to understand that normal physiological parameters for one patient may differ for another. For example, a normal oxygen saturation recording on a patient with chronic obstructive pulmonary disease may be low compared to a young healthy person who has had elective surgery. The track and trigger systems do not account for this. However, it has been found that specificity is generally acceptable (Gao et al 2007). Subbe et al (2003) claim there is little evidence to suggest outcomes

such as a reduction in cardiac arrest calls are improved although other authors have reported enhanced outcomes when the systems are combined with the intervention of the critical care outreach team (Ball et al 2003, Priestly et al 2004, Ryan et al 2004, Endacott et al 2010). However, conversely other studies have shown that track and trigger systems allow a nurse to quantify a change in a patient's condition thus imbuing them with confidence when communicating concerns (Andrews 2004, Andrews and Waterman 2005). The systems can sometimes legitimise a nurse's hunch which is why some systems include the criterion 'cause for concern', or 'nurse concern' which accounts for between 11% and 46% of calls (Cioffi et al 2009, 2010). The vagueness of the term indicates that nurses are expected to assess and make decisions in very uncertain circumstances which can be difficult to convey (Cioffi et al 2009). Interestingly a few studies have shown this criterion to be utilised when the other physiological parameters have not been met (Andrews and Waterman 2005).

What remains missing from work thus far is an explanation of how nurses become concerned about a patient and what leads them to consider seeking help from colleagues and other professionals. Given that authors (Cioffi et al 2010) are debating the concept of 'nurse concern' as recently as 2010, it seems timely to examine what factors influence nurses' decision-making at these times. An approach from the nurses' perspective may shine new light into an area of clinical ambiguity. These decisions may not necessarily be emergency decisions, but do appear to hold urgency for the nurse when faced with a deteriorating patient. This led me to explore other ways nurses are assisted in this context.

More recently authors have reported the use of computerised decision tools being used as hand-held devices in the ward area (Preston and Flynn 2010, BBC 2011). These devices require all of the vital signs to be entered, ensuring the task is fully completed before automatically calculating a score thus offering decision support to the user (Smith et al 2006). However, we know from a number of vital sign audits, that nurses are notorious for not completing the vital signs fully, accurately, or in a timely fashion. Neither do

they always act upon them (Smith 2008). This raises questions as to the efficacy of such a tool in a busy ward on a busy day. These devices can also be accessed via a wireless network by other users, such as the outreach team who may pick up an alert from the bedside to attend to a ward patient. They also offer central data storage for audit and information governance purposes. Mohammad et al (2009) and Prytherch et al (2006) found that the hand-held device improved the accuracy of the scoring system and was less time consuming to complete than paper methods plus aided communication as the operators were more confident in the results. The users reported a preference for the hand-held devices over traditional pen and paper methods (Prytherch et al 2006). The BBC (2011) reported on Radio 4, a system in use at a Birmingham hospital that alerted critical care outreach nurses directly via a smart phone when the vital signs entered at the bedside on a ward were abnormal. They claimed that response times were faster and therefore interventions were more timely. However, such tools only represent one aspect of the varied influences on nurses as they form judgements on patient care and reach clinical decisions about referrals. A full understanding of these processes in the context of acute care is yet to emerge.

The concept of providing staff with track and trigger systems is believed to assist nurses with the decision-making process. However, studies continue to show failings in detecting sick patients (NICE 2007, Massey 2007, Odell et al 2009, Tait 2010). Decision support tools such as these systems provide guidance but rely on the nurses using them in the first place, recording accurately and acting upon their findings. The world of acute care is complex, and the literature has shown us that patients require an individualised approach. This complexity generates a multifaceted clinical environment necessitating a more circumspect approach to its investigation. This led me to consider what else needs to be illuminated to understand how nurses make decisions when caring for declining patients. Structures have been put in place to support staff using objective assessment strategies and teams of critical care helpers, but what is happening at the time a nurse is caring for a sick patient? What are they thinking? How are they questioning and problem solving the situation in order to make appropriate decisions and subsequent

timely actions and interventions, such as calling for help? This problem solving and critical thinking or clinical reasoning is poorly understood in this context. Enhanced awareness may unlock the issues that elucidate how nurses recognise and respond to a patient whose condition is deteriorating. Flaws in the current systems may be revealed that can be addressed, ultimately resulting in improvements to patient care outcomes.

1.3.3 Education and Training

In response to concerns widely published during the 1990s, clinicians in partnership with University institutions and other organisations such as the Resuscitation Council designed a number of education and training programmes to address the knowledge deficits believed to exist in non-critical care areas. Specific training programmes such as the ALERT™ Course² (Smith 2000) were incorporated into basic training for all nurses and doctors, including non-registered staff such as health care assistants. In-house education programmes designed by the critical care outreach teams also exist and are routinely run (DH 2009). More recently, education and training using simulation mannequins, including the Advanced Life Support (ALS) course and as part of University programmes, have been introduced to expose staff to critical situations and address the shortcomings that have been identified in some areas in the delivery of acute care. Despite these initiatives, evidence still demonstrates delays in response to deterioration known as a ‘failure to rescue’. The next section discusses the response by nurses to the deteriorating ward patient.

1.4 The Ward Patient and the Ward Environment

Nursing staff on the wards have struggled to detect and manage deteriorating ward patients adequately as they are hampered by inexperience, lack of skill and excessive workloads (Goldhill and McNarry 2002, Odell et al 2009). The

² The ALERT™ Course is a one day programme with a practical element on the recognition and response to ward patients who become unwell. Founded in Portsmouth Hospital by the critical care team it is widely taught in acute hospitals. ALERT™ = Acute Life-threatening Events Recognition & Treatment

casemix has changed with a decrease in the number of acute hospital beds reported since 1982 and an increase in demand on the wards forcing nurses to make more complex and advanced decisions in ambiguous critical situations (Hensher and Edwards 1999, Goldhill and McNarry 2002). Ward environments present many competing priorities for staff who experience high levels of stress associated with lack of control, work pressures and difficulties in providing support for patients and relatives; they are 'turbulent' work environments (Allen 1997, Tait 2010). Observations are considered routine, and the literature has shown examples where the track and trigger scoring protocols are not followed thoroughly (Endacott et al 2007, Odell et al 2009, Shearer et al 2012). Despite these tools and critical care outreach support in place, nurses are still reported as not being confident about calling for help, feeling uncertain and anxious or waiting until further deterioration occurs prior to escalating concerns (Cioffi 2000, Andrews and Waterman 2005, Cioffi et al 2010).

Inadequate communication between different disciplines also appears to be a factor affecting the response to the deteriorating ward patient (Andrews and Waterman 2005, Endacott et al 2007). Assessment skills have been shown to be variable and in some cases inaccurate and delayed due to a cautious approach (Thompson et al 2009, Kinsman et al 2009). Ludikhuizen et al (2012) examined how nurses and physicians judge their own quality of care for deteriorating patients on medical wards in a Dutch hospital, compared to the judgement of a panel of independent experts. The participants were staff who had cared for a patient in the preceding 12 hours prior to the patient enduring a cardiac arrest or requiring an unplanned admission to the ICU. The authors' premise was that communication, teamwork, leadership, care coordination, knowledge and skill are factors that influence the care of the patient at moments of clinical instability. Their findings showed that the participants rated their knowledge and skill as on average, 7 out of 10, (10 being the highest score). The participants perceived a delay in care provision in 31% of the cases compared to a perceived delay of 62% of the cases when the notes and charts were reviewed by the expert panel of intensive care specialists. This discrepancy of opinions represents a patient safety issue given that

these patients suffered serious adverse events in the face of the health care workers believing care was adequate. The participants believed they worked well as a team across professions coordinating care, yet the patients continued to deteriorate and apparent delays in care ensued.

Some researchers report nurses knowing that something is wrong with the patient prior to changes in vital signs, possibly picking up subtle cues, or recognising a change in a pattern (Tait 2010). Others have suggested a range of decision-making models are utilised in the detection of a deteriorating patient. This patient safety issue is recognised by the National Patient Safety Agency (NPSA) and the Institute for Innovation and Improvement who have incorporated deterioration into their patient safety agendas via the 'Patient Safety First' initiative (Patient Safety First 2012). As well as guidance on the recognition and response to deterioration, other initiatives to raise safety awareness and improve situation awareness are now prevalent in policy and the literature (Cooper et al 2010, Moore 2011, NHS South West 2011, Stubbings et al 2012). These government initiatives have learned lessons from other disciplines such as aviation, where human factors and the importance of situation awareness are paramount to ensure safety. This led me to consider these additional factors when structuring an approach to the study of suboptimal care of the critically ill ward patient. Appendix 2 summarises the strengths and weaknesses of the empirical research reviewed.

Previous research has either focused on a retrospective examination of the clinical decisions made by ward staff or used simulation to examine decision-making at the time a patient deteriorates. The literature does not acknowledge the intricate environment in which this care takes place. The acute care ward comprises many strands of care, interwoven yet working towards the same goal. Each element of the strand comprises differing individuals from patients and their relatives to highly experienced care professionals. Each member of the clinical team has distinct perspectives based on their own knowledge, training and self-awareness. Strauss (1982) considered these differing perspectives as interorganisational relationships

that require negotiations between them to implement projects, plans or even routine activities. Transposed to the acute care setting, this relates to the way clinical staff work together as individuals, or how teams or entities such as wards and departments strive for the goals of patient safety and high quality care. This aspect has not been acknowledged within the literature, which has consisted of largely quantitative approaches. The mix of unique individuals produces multiple realities and results in a kaleidoscope of issues unfolding on the ward with the inherent interplay of social dynamics. This led me to ask:

- i. What are the contextual factors that affect the recognition and response to deterioration of the unwell ward patient?
- ii. What influences decision-making when caring for a patient whose condition is deteriorating?
- iii. Which contextual factors in a ward environment promote good quality care for this group of patients (defined as timely intervention when a patient's condition deteriorated)?

Understanding the answer to these questions is important because nurses must identify subtle signs of deterioration in the patient's condition. Nurses who recognise ominous events early and take corrective action, either independently or in collaboration with other colleagues, can prevent further decline of the patient and increase the likelihood of a positive outcome for them (Minick and Harvey 2003). This depends on nurses being properly equipped with the skills to make the right decisions in ambiguous situations and under time pressure. However, clinical decision-making is not a skill that can be simply explained, understood and recalled (Paterson et al 2002). This is because of its rapid, complex and often subconscious nature (Higgs and Jones 2000). Therefore, uncovering some of the practice knowledge that informs the process of decision-making is valuable for health professional practice, development and education (Ajjawi 2007).

Communication of clinical reasoning and decision-making is important in order to ensure high quality clinical decisions. Greater insights into the way nurses make decisions in acute care nursing are necessary to optimise clinical

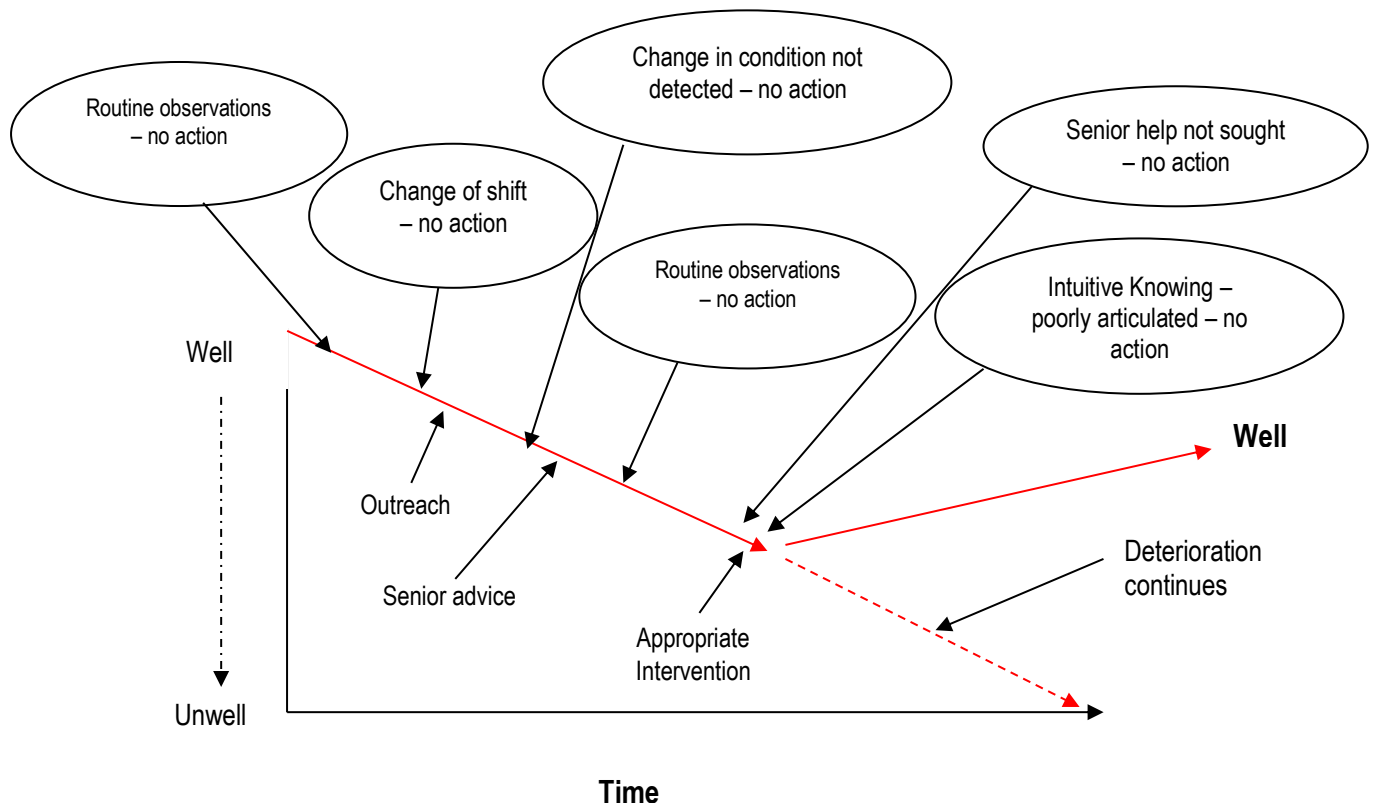
practice. In order to enable me to conceptualise the issues I summarised the research problem derived from the literature into a diagram that mapped the processes as we currently understand them. I labelled this the Downhill Trajectory of Care (Figure 1.1). It served to summarise the problem as I saw it at the start of the study. Decisions relating to the recognition of deterioration occur at key points in the trajectory. These have been distinguished as follows:

- The nurse undertakes routine ward work, performing standard observations of the patients. Decision-making at this point on the trajectory is of a routine nature. The deteriorating patient is subject to a number of routine procedures, depicted by the text in circles above. If indicators result in no action the patient will continue to deteriorate (dotted line towards death).
- Below the deterioration line are depicted the support mechanisms in place that could make the difference to outcome. These are opportunities that if initiated, the patient could move back up the continuum to wellness. The implementation of these actions leads to decision-making that is more urgent and in some cases can be of an emergency nature.

The balloons above the line represent the factors that may result in the patient's condition deteriorating. These could occur at any point along the trajectory. The phrases below the line represent factors that may prevent further deterioration if instigated early enough. These are the actions that nurses should be taking rather than the inaction depicted in the balloons. As with many trajectories, the depiction of a straight line is an over simplification; however it serves to illustrate the potential deterioration that may occur should no corrective actions take place to assist the patient. Nurses are practising in an uncertain clinical environment once they recognise the changing clinical picture and start to act on it. The problem is that frequently actions are not carried out. The question for me was why does this happen? What

influences nurses to practice and make decisions? It seemed essential to explore this phenomenon alongside the nurses as they underwent the process.

Figure 1.1 The Downhill Trajectory of Care (Adapted from McQuillan 2000)



1.5 Framework of Initial Assumptions

The theoretical framework for this study centred firstly on the literature surrounding suboptimal care of the critically ill patient. It then progressed to the literature examining decision-making, focusing on the clinical reasoning undertaken by nurses who were concerned that a patient's condition was deteriorating. It centred on decision-making 'in the moment' against a backdrop of ambiguity. From these works I conceptualised the decision-making processes into three broad concepts:

- i. Approaches to understanding decision-making
- ii. Decision-making in uncertain situations

iii. Decision-making in urgent situations.

In order to understand these concepts I felt it was imperative to be present alongside the nurses as they cared for their caseload. There was no '*a priori*' theory that informed this study, but current and seminal works on clinical decision-making and reasoning theories were considered as the study evolved. This literature was used to theoretically sensitise me to the decision-making phenomenon. This allowed me to fully immerse myself in this complex world during the data collection and data analysis phases of the study. The process of making decisions is a cognitive one, therefore largely hidden. In order for the phenomenon to be exposed the choice of methodology and methods needed to have congruence with the question being studied. This is a world of multiple realities, one where many social processes are at play that hold different meanings for different people. In order to illuminate the phenomenon I chose to examine it through a decision-making lens using an interpretative approach in the real world of clinical practice.

The aim of the study was:

- To understand the processes by which these clinical decisions are made, the point at which referrals are made and what information is given priority in those decisions by studying the staff, events and practices in their own terms.

The primary objective of the study was:

- To generate a theory of decision-making in the presence of clinical deterioration in practice from practice.

The next section explains the layout of the thesis.

1.6 Structure of the Thesis

Chapter 2 presents the seminal and current models and theories of decision-making related to acute care nursing. These are organised according to the concepts set out above:

- Approaches to understanding decision-making
- Decision-making in uncertain situations
- Decision-making in urgent situations.

The research is critically appraised and its application to acute care nursing discussed. Gaps in the literature pertaining to the clinical decision-making process particular to acute care nursing are identified. The method I used to search and select the literature is also explained.

Chapter 3 sets out the methodology I used for the study. For the most part, clinical decision-making is not an observable or directly demonstrable concept. It is a highly complex, cognitive process, which, due to its complexity, is often difficult to comprehend and communicate even by practitioners themselves (Ajjawi 2007). It was important that the selected investigation design best illuminated the phenomenon. I believed a qualitative approach was most appropriate. I did not feel that the quantitative paradigm with its ontological and epistemological view was congruent with exploring acute care nurses' thinking in uncertain clinical situations. In that paradigm, truth and meaning are considered to exist independently of the knower and reside in the objects themselves (Crotty 1998). Clinical decision-making, its communication and negotiation are cognitive transactions. Interpersonal activities must be viewed from the context of the individuals concerned, within the time and place of the reasoning event. Hence they cannot be satisfactorily reduced to the measurable components required for quantitative research. From the range of research approaches available in this paradigm I chose to use dimensional analysis from the grounded theory tradition (Schatzman 1991). Chapter 3 explains and defends this decision.

Chapter 4 details the research methods and analysis undertaken. The study was undertaken in three distinct phases:

- i. Fieldwork and interview with seven participants to collect initial data
- ii. For comparison and using theoretical sampling, further fieldwork and interviews with participants took place having begun dimensional analysis
- iii. Verification of theory development via three further interviews with a further 3 participants, a focus group and development of the explanatory matrix.

I positioned myself in the field to sensitise myself to the work and arrangements in the hospital which was sociologically strange to me. I used the fieldwork for cultural exposure so that I could bring to light during data collection the social processes that were occurring. Field notes were not used as data but enabled the development of the interview questions. Data were collected from semi-structured interviews and one focus group. Dimensional analysis was used to analyse the data using the constant comparison approach. Memos were written throughout the process. Decisions about data collection, sampling and the conjuring of emerging dimensions and their properties guided the process (Schatzman 1991, Scholes 2011).

Chapter 5 presents the findings of the study. This chapter introduces the reader to a presentation of the 3 main modes in which the nurses were operating. It describes and explains how the nurses reasoned when faced with a patient they were concerned about. Selected quotations support the analysis. Dimensions are described and the explanatory matrix and substantive theory are presented.

In chapter 6 the findings are discussed in the light of the current literature. This literature is reviewed and the aspects which add meaning to this study are highlighted. How my research potentially provides texture and substance to existing theories is suggested. Limitations of the study are discussed and this chapter also outlines the implications for practice. It makes

recommendations going forward to improve the decision-making processes when caring for an acutely unwell patient.

Chapter 7 draws the implications for practice from the discussions that have developed in chapter 6 and provides a summary of the contextual factors that influence decision-making with the acutely unwell in the form of a substantive theory and decision-making model.

1.7 Summary

There is no substantive evidence currently available regarding what constitutes optimal support for ward staff, nor any nationally agreed standards nor educational programmes to support the level of decision-making required by professionals with the acutely unwell deteriorating patient (Hancock and Durham 2007). It seemed important and necessary to understand more about the processes by which these clinical decisions are reached and the factors that influenced them. Hancock and Easen (2006) state that there is still a paucity of knowledge about the correlation between information, the cues used to guide decisions and the decisions reached by nurses in the context of clinical practice. Researchers have recommended the consideration of qualitative methods to capture the experience of patients and staff, and the organisational (cultural) issues associated with the delivery of effective services (Andrews and Waterman 2005, Esmonde et al 2006, Odell et al 2009).

No research to date has prospectively examined the factors that influence decision-making at the specific point when a patient's condition is deteriorating in the ward area. The impact of time pressures and the interplay of situational awareness and social processes remain poorly understood. This thesis describes an investigation into the factors that affect how nurses make decisions in the ward environment, including the way cues are used, interactions among professionals, environmental factors and nurses' reasoning in the real dynamic environment. The aim was to enhance

understanding of how nurses reasoned when concerned about a patient's condition and consider what can be undertaken to improve it. It is imperative that this highly vulnerable group receive optimal care by judicious identification and intervention following accurate and timely decision-making and clinical judgement.

This chapter has established the background context that informed this study with reference to both motivation and initial influences. The baseline framework offered by the existing literature is submitted with an accompanying acknowledgement of potential lacunae. The chapter then outlined the structure of the thesis giving a brief overview of each chapter. The next section provides a detailed literature review of the body of knowledge with regard to decision-making in relation to acute care.

Chapter 2 – Literature Review

2.1 Introduction

This chapter presents and considers the current literature on the theory and knowledge of clinical decision-making processes in the context of acute care nursing. The various models of clinical decision-making that have emerged from the existing knowledge base are discussed. The key themes are identified and explored to help illuminate the research question.

The objective was to undertake a systematic and comprehensive search for all relevant literature in order to clarify what is known in the area and what needs to be understood. Specific aims were to:

- Compare theories of decision-making in acute care nursing
- Explore and critique the empirical evidence supporting these theories
- Build a theoretical framework for the study
- Identify gaps in the currently available evidence
- Illuminate theoretical levers with which to interrogate the data
- Highlight the factors that make this a contemporary problem.

The next section explains the search strategy adopted for this study.

2.2 Search Strategy

The debates over when a detailed literature review should be undertaken in a grounded theory methodology are discussed in chapter 3. In this study the background literature was examined at the outset to help identify the research question. This area is briefly considered below. A more detailed literature search and review was then undertaken after the data had generated theoretical sensitivity and was used for theoretical comparison.

Hart's (2001) strategies were employed to identify potential literature for review. Two searches were deployed: the topic and the methodology literature search. The topic literature search focused on clinical decision-making and clinical judgement in nursing using key words 'clinical decision-making', 'clinical judgement', 'clinical reasoning', 'acute care decision-making', 'nurse decision-making'. Chapter 3 presents the literature pertaining to the chosen methodology.

Online library keyword searches were undertaken via the University of Brighton using the subject words 'nursing and midwifery', 'health professions', 'social policy sociology and politics' on 'CrossSearch' . The databases searched are listed in Table 2.1. These databases are automatically generated by 'CrossSearch' hence the large number of initial citations, which were refined to the 76 that were relevant to the topic.

There was no limitation on the type of study design to be identified in the search. This was to allow all critical material to be amassed. These comprised a range of audits, research trials, editorials, commentaries, and literature reviews. To enable greater insight into the problem, relevant citations from different disciplines such as psychology, sociology, medicine and therapy disciplines were also obtained (Sharples et al 1990, Dillner 1995).

Table 2.1 Databases Searched on CrossSearch

Database	Number of Citations
Allied and Complementary Medicine (AMED)	851
Applied Social Sciences Index and Abstracts (ASSIA)	1722
Arts and Humanities Citation Index (Web of Science)	69
BioMed Central	7523
British Humanities Index (BHI)	6
British Nursing Index (BNI)	604
Cochrane Library	2
Criminal Justice Abstracts (CJA)	359
Cumulative Index to Nursing and Allied Health Literature (CINAHL) Plus with Full Text	23751
EMBASE	20888
Expanded Academic ASAP	2097
IngentaConnect	4507

Database	Number of Citations
JSTOR Arts & Sciences I Archive Collection	4131
JSTOR Arts & Sciences II Archive Collection	4040
Newspapers	1
ProQuest Medical Library (PML)	104377
PsychINFO	8527
PubMed	29763
SAGE Premier 2011	35180
Social Sciences Citation Index (Web of Science)	8502
SPORTDiscus	907
University of Brighton Library Catalogue	53
Web of Science	31516

In addition, grey literature was sought from GreyLitNet, MedlinePlus, SchHARR-Lock's Guide to the Evidence and The National Research Register. Nine theses were found, two pertaining to this topic. A journal search was made from the most commonly cited journals and an author search of the most frequently cited authors. Cross referencing from existing publications yielded more citations.

2.2.1 Inclusion and Exclusion Criteria

Literature older than 15 years old was excluded unless regarded as a seminal work because outcomes, treatment and acute care patient case mix have changed to such an extent that the literature would have very little contemporary relevance (Hayes et al 2000).

Inclusion criteria were:

- i. Research reports related to outcome measures, quality of care, diagnosis and decision-making from the UK, USA, Australia and Europe
- ii. Policy documents focusing on caring for the critically ill patient in non-critical care areas
- iii. Articles published in nursing and healthcare journals on all the above topics plus those relating to critical illness or emergency situations outside of a critical care setting

- iv. Published conference papers
- v. Articles / books and reports published in English

Exclusion criteria were:

- i. Anecdotal stories
- ii. Articles published in other languages other than English

How decisions are made is of concern to health care professionals, policy makers and the recipients of those decisions (Lamond and Thompson 2000). Despite its importance it remains under-researched (Lamb and Sevdalis 2011). This study examined how nurses reach their decisions, in other words the *reasoning process*, rather than the quality of the decisions made. The literature review, therefore, focused on decision process rather than decision outcome. This review evaluates:

- i. Seminal theories
- ii. Contemporary theories
- iii. Application of these theories to acute care nursing
- iv. Gaps in the literature pertaining to the clinical decision process in acute care nursing.

Clinical decision-making is an intrinsic part of clinical practice and making accurate decisions is essential (Hancock and Easen 2006). Clinical decision-making occurs when one course of action is selected and chosen over all other options. These individual choices impact on the quality of care a patient receives (Gerdtz and Bucknall 1999). In order to understand the processes involved in clinical decision-making it is essential to consider the context in which decision-making activities are being performed (Bucknall 2000). Nurses, doctors and other practitioners have to decide what data to collect about a patient, interpret this information, then plan and administer an intervention, finally evaluating the outcomes and checking whether the clinical problem has been resolved or not (Bucknall 2000).

Nursing occurs in unpredictable social contexts, which require, in order to be managed effectively, some conscious deliberation on the best way to care for patients (Greenwood 2000). Nurses have to account for the decisions they make on behalf of patients and ensure they are explicable and defensible (Mullally 2002, Thompson and Dowding 2002, Nursing and Midwifery Council - NMC 2008). Acute care nursing demands intelligent decision-making that is timely and accurate, often when a patient's condition is deteriorating and sometimes in a short time frame. This decision-making has been conceptualised into three broad categories:

- Approaches to understanding decision-making
- Decision-making in uncertain situations
- Decision-making in urgent situations.

Appendix 3 summarises the strengths and weaknesses of the empirical studies reviewed in this chapter.

2.3 Approaches to Understanding Decision-Making

This section discusses the literature associated with decision-making in circumstances that are predictable and routine. It considers the areas where research has produced relevant evidence and illuminates where gaps in evidence remain. An alternative approach to exploring the phenomenon is proposed.

2.3.1 Background Literature Review

The way professionals make decisions has been conceptualised in many ways by many authors over the past 50 years (Elstein and Bordage 1988). During the 1960s and 1970s a number of studies reported on the way non-clinical staff such as administrators, bank investors, chess players and teachers approached problem solving (Elstein et al 1978). Medical decision-making was also examined during this time up to and including the 1980s.

Seminal theories were generated that described how medical staff routinely undertook clinical judgements and decisions. During the 1980s Dowie and colleagues undertook research introducing a cognitive element (Dowie and Elstein 1988). This focused on understanding the nature of clinical reasoning and expertise and led to the development of a number of theories and models discussed later (Dowie and Elstein 1988).

Much of the research into medical decision-making took place in a laboratory setting and was designed to produce experimental evidence. Studies used simulation techniques, posing hypothetical problems that participants had to use decision-making skills to solve. This early work described how people used cues when problem solving, often jumping steps and using 'rules of thumb' (heuristics). They performed extensive information processing tasks that eventually led to a decision (Elstein et al 1978, Wolf et al 1988). Clinical inference was also described in this early work, providing an insight into how the participants reached their decisions. The quality of these decisions was not explored in these studies.

These early studies led to the information-processing paradigm being conceptualised. This assumed that clinical decision-making was undertaken in a structured orderly manner where the clinician followed a series of cognitive steps by which the diagnosis was established and the appropriate interventions instigated (Martin 1999). Early research on decision-making theories was rationalist in its approach arguing that the information-processing model was the predominant decision-making model (Hamm 1988, Currey and Botti 2003). This model is a linear and simple approach that presumed practitioners made a logical and rational analysis of a situation, using tangible cues that enabled them to build a hypothesis of a patient's condition (Doubilet and McNeil 1988, Harbison 2006, Currey and Botti 2003, Thompson 2003).

This positivist view of the process does not reflect the dynamic world and multiple realities that prevail in the acute care environment (Currey and Botti 2003). Simulated, controlled settings do not allow for conditions such as stress nor the personal interactions that are often encountered in clinical

settings to be considered or explored (Bucknall 2003). The complexities of decision-making that actually occur in clinical practice were not reflected in the design of the early decision-making research. The studies did not consider the particular role of clinical care nurses in the decision-making path. This gap in knowledge calls for a new approach in order to examine the real time processes that influence decision-making in the context of acute care.

2.3.2 Hypothetico-Deductive Reasoning

Decision-making in routine situations has also been described using hypothetico-deductive terminology by seminal authors of the 1970s and 1980s (Elstein et al 1978, Dowie and Elstein 1988). Hypothetico-deductive reasoning was founded on the information-processing approach and dominated the decision-making literature until the 1980s (Elstein et al 1978). It involved the generation of hypotheses built from clinical data followed by the testing out of these hypotheses through further inquiry (Higgs and Jones 2000). The hypothetico-deductive model describes decision-making as an interactive process comprising:

- i. Data collection
- ii. Hypothesis generation
- iii. Cue interpretation
- iv. Hypothesis testing and evaluation.

This is known as the four-stage model of medical inquiry (Elstein et al 1978). This model showed that physicians used cues to seek patterns within the information they were gathering. They made risky hypotheses if they prematurely reached conclusions. However, this study identified that participants delayed arriving at a solution until a large number of cues were identified. Their thinking then led them to rule out other hypotheses considered earlier in the problem solving process.

In addition to the four-stage process described by Elstein et al (1978), Carnevali et al (1984) and Carnevali and Thomas (1993) described a seven stage process of diagnostic reasoning in nursing (Table 2.2).

Table 2.2 The Seven Stage Process of Diagnostic Reasoning in Nursing

<ol style="list-style-type: none">1. Exposure to pre-encounter data2. Entry to the data search field and shaping the direction of data gathering3. Coalescing of cues into clusters or chunks4. Activating possible diagnostic explanations (hypotheses)5. Hypothesis and data directed search of the data field6. Testing diagnostic hypothesis for goodness of fit7. Diagnosis
Carnevali et al 1984, Carnevali and Thomas 1993

Clinical problems often present with little initial information so there is a tendency for the practitioner to use cues to sift the data. Although this model has more steps identified in the process than Elstein's (1978), it still follows a linear path. Neither model describes or reflects the complexity of the real world, and therefore may not resonate as a paradigm to explain the decision-making and clinical reasoning approach used with acutely unwell patients. The structure of the linear model might influence some practitioners to rule out hypotheses early on in the process that in fact may have been helpful in reaching an accurate solution. In clinical practice is not always possible to wait for a large number of cues before reaching a decision, particularly when faced with an urgent situation.

The hypothetico-deductive model comprises both inductive reasoning through hypothesis generation from a set of observations to a generalisation, and deductive reasoning through the testing of the hypothesis from a generalisation to a conclusion (Higgs and Jones 2000). This abductive thinking resonates with what we know about the acute care world which is multifaceted. Nurses do not work in isolation; they seek information from multiple sources. These include the patient, observed vital signs, advice from

colleagues, plus their own experience and empirical knowledge. All are considered singly and as a whole while the nurse builds a clinical picture that will influence the decision-making environment. Nurses are continually exposed to other people's perspectives and opinions. The process is not linear but convoluted. The hypothetico-deductive approach is an important model for consideration in relation to acute care because it demands the practitioner to compare and contrast a panoply of different data generated from varied sources. This demonstrates a move away from the previously discussed linear theories of decision-making, and may help navigate the web of social processes in play when a nurse is involved in decision-making over the care of a patient whose condition is deteriorating.

2.3.3 Noticing Patterns in Routine Decision-Making

Pattern recognition as a tool for interpretation of the decision-making process has been supported by a number of researchers (Benner et al 1996, Minick & Harvey 2003, Arocha et al 2005) who employ the terms 'backward reasoning' and 'forward reasoning' in their studies. 'Backward reasoning' is where the reinterpretation of data or the acquisition of new clarifying data is invoked to test a hypothesis and 'forward reasoning' describes how the data analysis results are reached following a hypothesis (Arocha et al 2005).

Minick and Harvey (2003) suggested that nurses learn subtle patterns from individual patients they care for as well as from types of groups of patients. Knowledge of the patient was a key aspect of the nurses' pattern recognition development. This was developed throughout the span of a shift both from the patient and from the patient's family. In terms of groups of patients and caring for the same patient over a longer period of time, knowing what to expect played a role in noticing patterns or deviations from patterns. The concept of 'knowing', according to Minick and Harvey's study (2003), enabled the nurse to respond to the subtle changes in their patients. An understanding of the relevance of these subtle changes has yet to be fully explained. This aspect of decision-making could only be examined from the perspective of the nurses observing these changes and making these

decisions in real time. This would enable a researcher to tease out the nurses' thinking processes and experience their reactions. An essential aspect of decision-making is recognising patient problems early. This requires the use of pattern recognition, identifying cues which inform the clinical picture the nurses are continually building. How these cues are managed is discussed in the next section.

2.3.4 The Use of Cues in Decision-Making

The use of cues picked up via short term and long term memory are thought to be key in the way nurses make decisions. Clustering or chunking the cues together allows categorisation to interrelate and interpret them, thereby allowing the nurse to build a picture (Carnevali and Thomas 1993). The collation can be influenced by a number of factors, for example, the experience of the nurse (Hoffman et al 2009, Thompson 1999, Dowding and Thompson 2003, Aitken et al 2011). Expert nurses have been shown to be more accurate in making diagnoses and better able to rapidly select relevant cues. Studies recording this used simulation and narrative research techniques (Reischman and Yarandi 2002, Kinsman et al 2009). Currey and Botti (2003) claim that experienced nurses are able to distinguish important cues from unimportant cues and act on patterns of information. This results in faster and more accurate decisions.

Contextualising cue usage into proactive and reactive tasks showed that expert nurses were far more proactive in cue usage than novice nurses who reasoned backwards to determine why a problem had occurred (Hoffman et al 2009). This has important implications for training and support for new and junior nurses. Benner et al (1996) described pattern recognition, common sense understanding, skilled know-how and a sense of salience, in other words cue relevancy in describing expert behaviour (Benner et al 1996, Reischman and Yarandi 2002). In Reischman and Yarandi's study (2002) this was associated with a higher incidence of diagnoses that were correct. The detection of extensive cues is as important in clinical practice as detecting the right cue. Novice nurses who notice fewer cues or the wrong cues make

more inaccurate diagnoses (Endacott et al 2010, Cooper et al 2012). Again this has implications for nursing practice and education. These findings have important implications for how acute care nurses could be trained to better use cues when caring for patients.

Inexperienced nurses tend to be constrained by rule bound thinking which may influence their ability to detect and assimilate cues (Gillespie 2010). The accuracy of their decisions and judgements may therefore be suboptimal and lead to erroneous judgements. This was reflected in the findings of Endacott et al (2010) where in a simulation student nurses overlooked prescient cues in favour of more apparent indicators. Moreover, some actions taken in response to the cues were inappropriate. The use of cues and their relevance is yet to be fully explained in acute care and requires further investigation as delays in forming judgements in the care of a deteriorating patient can result in suboptimal outcomes. This again points to the potential for improving nursing education.

Thompson et al (2000, 2009) examined nurses' assessments of the risk of a patient having an adverse critical event using a 'lens' model that provided what was wrong with the patient on one side with cues such as possible signs and symptoms that the patient displayed depicted on the other side of the model. This allowed examination of how individuals used information to arrive at a clinical judgement. The findings showed that nurses synthesised information in non-linear ways but their intuition made little contribution to decision accuracy. The overall tendency was overestimation of risk due to cautious prediction. This has been shown to be a feature of nurses' triage decision-making (Gerdtz and Bucknall 2001). There was no relationship between experience and more or less extensive use of intuitive knowledge in this study. This is theoretically important because reasoning derived from information that is empirically important can outperform intuitive judgements. The nurses relied largely on non-linear reasoning and intuitive reasoning and thus were prone to the biases that arise when heuristics (cognitive short cuts) are employed. Strategies such as being aware of one's own cognitive process and its inherent deficits in addition to the potential biases associated

with heuristics can help. The argument for teaching clinicians such techniques is compelling given the growth in nursing roles and decision-making responsibilities. Simply teaching nurses how to structure their decisions by making their own choices and values explicit **may** improve decision quality.

A criticism levied at the information-processing theorem is that it does not reflect the complexities of clinical practice and the way decisions move tangentially from linear points; it does not reflect the reality of the clinical arena where complexity, ambiguity and uncertainty prevail, particularly when caring for the declining patient. This demands a new approach to analyse decision-making in the acute care world. Simulation and theoretical scenarios are limited in that they cannot completely replicate the intricacies of the real world. However, simulation is the closest practitioners have got to the real world in a study setting. People do not work alone in the wards; they are dependent on colleagues and teams to inform their thinking. They actively seek information from a number of sources which then influences their problem solving and decision-making ability. These factors are not explored in the early research. There is therefore an identifiable gap in the literature. How do nurses in acute care settings incorporate linear thinking within complex clinical scenarios? This requires further investigation.

2.3.5 The Intuitive-Humanistic Stance on Decision-Making

In a dichotic approach to the information-processing models discussed above, the literature also examines the concept of intuition as a factor in decision-making. Intuition is often proposed as one of the defining characteristics of expertise (Gobet & Chassy 2008). The model is most notably attributed to Patricia Benner (1984) in her work examining the way novices and experts make decisions in practice generated from data derived from practice. The main tenet of this theory is that nursing decisions can be the result of an almost unconscious level of cognition and that intuition and practical wisdom gained by experience play a significant part in everyday routine decision-making (Scholes and Moore 1997, Thompson 1999, Traynor et al 2010).

Benner's work is based on that of Dreyfus and Dreyfus who argue that good decisions are made intuitively by professionals with expertise. This expertise represents the end point of a five-stage sequential transformation from novice to expert (Table 2.3) bringing the debate into the realms of nursing as an 'art' as well as a 'science'. Moreover, Benner (1996) forcibly argues that intuitive judgement should not be divorced from science or scientific evidence. Indeed intuition alerts the nurse to subtle alterations in the patient's condition that then allows them more time to reason, deliberate, prepare and initiate confirmatory tests (Scholes and Moore 1997).

Table 2.3 The Five-Stages from Novice to Expert

Novice	Those with no experience of situations in which they are expected to perform and who find themselves governed by context-free rules as guides to action.
Advanced Beginners	Those who demonstrate marginally acceptable performance and have amassed enough experience to recognise recurring meaning in the situations they are involved in.
Competent	Those who see their actions as part of a longer-term plan which helps achieve efficiency and organisation in work.
Proficient	The practitioner begins to perceive things as a whole with speedy alterations to the long-term plan when expected normal patterns of care do not present themselves.
Expert	Someone who has no reliance on guiding rules or maxims and who has an intuitive grasp of situations; only falling back on hypothetico-deductive logic when a new or unexpected challenge arises.
Benner 1984	

Benner's work emphasised Dreyfus' model which is almost entirely based on learning from experience. There are only occasional references to theoretical learning or the development of fluency in standard tasks (Eraut 1994). Her research relied on accounts given after the event and seemed founded on nurses learning from experience, based on the gradual accumulation of memories of different patient cases that then imbued them with an intuitive response to a recurring situation. The way nurses select, organise and retrieve this huge volume of information is not addressed (Eraut 1994). It may be that the more relevant aspects of the case may not have been retained

and that the conclusion the nurse reaches is therefore of dubious validity. The fallibility of human judgement appears not to have been considered therefore the quality of the decisions reached therefore not assessed.

Intuition is characterised by rapid perception, grasp of the situation as a whole, lack of an awareness of the mechanisms leading to an action, and participation of emotions (Gobet and Chassy 2008). In nursing, the knowledge that experts use is not only theoretical knowledge acquired through training, but also practical and clinical knowledge gained through working with patients. Gobet and Chassy (2008) claim that this is learnt automatically and unconsciously through nurses' daily activities. Although there remains uncertainty in the exact way intuition is operationalised, authors suggest that nurses use heuristic strategies which contribute to how they arrive at intuitive judgements, particularly those judgements made in uncertain conditions, these are commonly heuristic in nature (Carnevali et al 1984, Cioffi 1997). Probability estimations are made in uncertain and complex situations based on previous experiences and memory. This occurs rapidly and can simplify the complexity of clinical judgements. Nursing in the acute care setting comprises a variety of levels of expertise among the nursing staff. Some are new to the profession and specialty in which they are working, whereas others are highly experienced, and therefore may be considered expert. In research that explores this clinical arena, staff of every level of expertise may contribute to the unfolding scenario. Benner's research (1984) needs to be considered in this context. The role of intuition is of particular interest given its opposing epistemological stance to preceding published arguments.

The unique characteristics of the person making the decision influence the decision-making process. These include their own experience, knowledge and personal variability (Hamers et al 1994). Drawing on knowledge to inform the decision is well documented in the literature within both paradigms of information-processing and the humanistic stance, as are experience and expertise (Benner 1984, Hamm 1988, Benner et al 1996). King and Macleod Clark (2002), using four of the five levels of expertise described by Benner

(1984), described the different ways nurses in the study came to their decisions. They concluded that a mixture of both intuitive and analytical elements were present in all of the nurses' clinical decision-making from advanced beginner to expert. However, expert nurses had a deeper reservoir of knowledge and experience to draw on that enabled them to harness concerns about patients, recognise clinical signs and identify the actions required to organise effective multidisciplinary involvement in the patient's care. The implications for practice in relation to this study are that nurses should be enabled to learn both intuitive and analytical aspects of decision-making in order to prepare them for practice.

Despite the impact Benner's work has had on the profession's thinking around nurse decision-making and of the relevance of individual expertise, nursing historically has used a model of assessment commonly known as the nursing process for prescribing patient care (Martin 1999). The nursing process assumes an information-processing, problem-solving model which does not allow for the unpredictability inherent in clinical practice and is not designed for the dynamic characteristics of the environment. Certainly in acute care, nursing decisions can be complex as the nurses have numerous alternative parameters to consider, each with varying attributes and often within a rapid timeframe (Currey and Botti 2006). Types of decisions made in acute care can be classified into several categories. Aitken et al (2011) developed the tables below to conceptualise these (Table 2.4 overleaf).

Table 2.4 Categories of Decisions

Decision category	Description
Assessment	Deciding that an assessment is required and/or what mode of assessment to use, including the decision to seek further information through patient assessment
Management	Deciding to deliver a particular intervention
Diagnosis	Classifying signs and symptoms as a basis for a management strategy
Planning	Determining what future assessment or management may be required
Evaluation	Deciding to collect information or combine multiple pieces of information to determine the effectiveness of a previous intervention
Clarification	Seeking further information from various sources to add knowledge or understanding prior to making additional decisions
Seeking Help	Requesting assistance from a colleague
Proposed by Aitken et al (2011)	

Martin (1999) undertook a grounded theory study to identify the factors that influenced nurses' clinical judgments in mental health nursing using a mix of observation, interviews and focus groups. He concluded that a range of strategies were employed to make clinical decisions. All of these overlapped in practice. According to Martin (1999) mental health nurses do not use any single approach when making clinical judgments. His theory has resonance with Benner et al (1996) and Schön's (1988) technical rationality models encompassing theoretical practical knowledge as well as intuition. What the study did reveal was that there was a theory to practice gap in relation to clinical judgment, reflecting a similar finding to Thompson et al (2000, 2009). This leaves the processes nurses use when they make their decisions yet to be fully explored and explained.

Many authors have suggested that intuition is a legitimate basis for decision-making in health care, especially in nursing (Lamond and Thompson 2000). Studies examining the way nurses make decisions have shown that intuition influences clinical decision-making with it appearing to present an additional dimension to the process (King 1997). In relation to the phenomenon of

deterioration, nurses have described an initial sense that something has changed, something is different and wrong with the patient and that they need to be with the patient and watch them closely (Pyles and Stern 1983, Benner and Tanner 1987, Smith 1987). These studies have also demonstrated the important role of pattern recognition as part of the decision-making process and intuitive thinking plays a key role in this. King and Macleod (2002) found that intuitive feelings appeared to act as a trigger that led the nurses to commence an analytical process of searching data to confirm their hunch. This process was dependent on the nurse's ability to understand the clinical situation so was more apparent in expert nurses who had the depth of knowledge and experience to use their intuition rapidly to recognise signs of deterioration. Scholes and Moore (1997), in their study in an ICU setting, found that nurses believed they intuitively noticed a change in the patient when in fact the data suggested this was far from the case. Nurses were constantly scanning, conceptualised as 'light housing', gathering information subconsciously. Their rhythmicity and systematic attention to detail was integral to their caring that sometimes they were unaware of their recognition of an alteration and subsequent swift intervention. However, some studies have somewhat denigrated intuition and not seen it as a legitimate aspect of the decision-making process (King 1997). Contemporary training programmes on care of the deteriorating patient focus on objective data collection that nurses need to note and communicate to other health professionals rather than how they might make effective use of their hunches. The role of intuition as part of the decision-making process is acknowledged and experienced by nurses. It is recognised as tacit knowledge. King and Macleod (2002) argue that intuition appears to inform and enhance logical thought and therefore should be responded to and employed in clinical practice.

Although the literature acknowledges the use of intuition in practice, questions still remain regarding how nurses currently use intuition and how they can develop and enhance its use to benefit patients. The role of intuition in caring for the deteriorating patient has yet to be unpacked and explained adequately. It is not known, for example, whether intuition can be intentionally selected as

a reasoning method in certain circumstances and used to respond effectively to particular patients. Exploring intuition requires an understanding of cognition, viewing the world from the different practitioners' perspectives to allow this concept to emerge. This demands an experiential study design of being present in the clinical area, allowing the multiple activities and interactions of nurses reacting to the deteriorating patient to be captured in real time.

2.3.6 Knowledge and Decision-Making

Knowledge falls broadly in two camps: theoretical knowledge and practical knowledge (experience). Theoretical knowledge is gained from learning formally about physiology, pathophysiology and practical knowledge learned through clinical experience (Andrews and Waterman 2005a). The use of knowledge and experience has been identified as significant influences on decision-making (Muir 2004). Watson (1994) found that experience was most commonly cited as the rationale for the decisions made in his study which employed the techniques of observation, simulation and scenario posing. He suggested that nurses can make use of even very limited experience to inform their decisions.

Thompson et al (2001) found that few inanimate sources of information were accessed by nurses to inform their decisions. Indeed, nurses did not find text based research useful when practising in the 'live' clinical area. For them, it was more useful and effective to garner information from people they considered credible clinically, such as clinical nurse specialists that may be working alongside them. This has important implications in the development of effective decision-making in acute care where critical care outreach nurses are often used as a resource to provide expertise in critical patient interventions. This raises questions about what factors would lead a nurse to seek help from an expert, and how and when they would decide to ask for help. This is a largely undocumented area of study, yet seems an integral issue given the on-going concerns published about deteriorating patients (Odell et al 2009, Patient Safety First 2012).

Hancock and Easen (2006) examined the decision-making of nurses extubating a patient in a cardio thoracic intensive care unit. Their study revealed little autonomy practised by the staff and a dominant hierarchical culture. Some nurses did not understand the rationale behind their practice. They found the decision-making process not linear, but complex and convoluted, affected by a number of factors. These included relationships, hierarchy, power, leadership, education, the condition of the patient, and the nurses' grade, experience and responsibility. Cultural, contextual and individual issues were all critical to decision-making. They concluded that education establishments should provide a curriculum that promotes professional autonomy by having an emphasis on education rather than training, moving from technique to understanding, a focus on autonomous decision-making and one that does not teach ritualistic thinking, but embraces inquiry in order to develop effective problem-solving skills. The implications of these findings are worthy of further exploration given that nurses are usually the key individuals deciding on initial care options in acute care environments.

Bucknall (2000) undertook an observational study examining the decisions of nurses in an acute care setting in Australia. While she identified that nurses made a patient care decision every 30 seconds in 3 main areas, the processes leading to the decisions were not examined. Bucknall used observation and interview techniques to examine the environmental influences on the decision-making process in a critical care unit (Bucknall 2003). The stability of the patient's condition influenced decision-making. Patient complexity slowed down decision-making, along with unfamiliarity, uncertainty and the confidence of the nurse in the situation. Available resources also affected the decision-making process. When there was up to date equipment, experienced critical care nursing and medical staff present, the process was calmer and less pressured. Interpersonal relationships were important to the participants with increased collaboration and mutual respect leading to a more harmonious environment that facilitated the sharing of knowledge, support and increased standards of care. This study was undertaken in an Australian critical care unit, but its findings may extrapolate to the acute care environment as they reflected previous studies in critical

care work (Bucknall 2003). This study also considered contextual factors giving credence to the multifactorial nature of nursing environments. Exploring the impact of environmental influences may elucidate how nurses make decisions in acute care situations.

McCallum et al (2011) explored the decision-making of 5 nursing students using a 3D virtual environment and avatars. Communications and assessments were made as if working with their mentor. How the students prioritised care and made decisions was examined. The majority of their decisions were reactive rather than proactive, and routine tasks were often not undertaken without cues, hints or requests from the virtual patient or mentor. However the study did support the notion that decision-making by nurses is both analytic and intuitive. This study was small in sample size and did not use prevalent real life ways of communicating and interacting suggesting that replicating some of the scenarios in clinical practice may elicit a different response.

Elstein et al (1978) discussed the use of Bayes' theorem in relation to decision-making. This theorem posits that people hold different levels of belief about scientific theories or outcomes depending on how they 'weight' the evidence they have against a hypothesis or assumption they are testing. If, for example, a compelling new piece of evidence arises to support a hypothesis, the theory states that the nurse will adjust their confidence in the hypothesis in line with their confidence in the new evidence. It could work either way with evidence perceived as tentative or questionable causing greater doubt in the hypothesis. In clinical decision-making the theorem's currency is probability. This approach depends on the degree of belief the decision maker has in uncertain events based on the information available to them (Fischhoff & Beyth-Marom 1988, Thompson 1999, Harbison 2006). Therefore a practitioner's beliefs may influence the decision made and the outcome reached.

The theory on a practical level can be flawed as it depends on a number of factors. These include; the nurse having a sufficient knowledge base to

underpin their judgement, the nurse not overlooking alternative hypotheses available to them, sound analysis of available options and an adequate search of pertinent information (Fischhoff & Beyth-Marom 1988). Furthermore, there is a risk that the beliefs the decision maker holds may not always accord with reality (Harbison 2006). Bayes' theorem is not a theory commonly discussed in the nursing literature, although in acute care nursing it carries merit given that although a multiplicity of data sources can inform decision-making, nurses still 'weigh-up' evidence and the influences on this process need drawing out. These studies used experimental designs. They did not examine the phenomenon using nurses' reasoning. There still remains, therefore, a gap in our understanding from the perspective of how nurses reason in the clinical setting. Bayes' theorem theory does not take account in the acute care world of the variety of staff who care for the patients and their varied levels of experience, knowledge and expertise and the impact this may have on the deteriorating patient.

2.3.7 Summary

Decision-making has been explored in many ways over the past 30 years. Models have been proposed that explain the processes occurring when decisions are being reached. Many of these studies have sat in the positivist paradigm describing a linear process which does not always reflect the ambiguity and web-like complexity of the clinical arena. Epistemologically these models do not resonate with the real world of acute care. Intuition and abductive models have also attempted to explain how decisions are made in practice. Researchers have undertaken studies to explore these in different clinical arenas, posing new versions of the seminal work. In short, none of the studies undertaken so far appear to fully explain the decision-making processes made by nurses in acute care. This is because areas other than acute care have been studied or explored in artificially created settings such as simulation. This represents an important gap in knowledge given the evidence published during the 1990s on poor ward care and clinical outcomes for deteriorating patients. A fresh approach is required wherein the social processes in play are unpicked to fully examine the phenomenon. The next

section explores the literature surrounding nurse decision-making in uncertain circumstances.

2.4 Decision-Making in Uncertain Situations

Acute care nursing takes place in a complex clinical environment. Routines exist in the organisation of care, but we know from chapter 1 that patients' conditions sometimes deteriorate causing concern to the teams caring for them. We know that over the past 20 years the casemix in the wards has altered with more acutely unwell patients residing in hospital (Audit Commission 1999, DH 2000). We also know that nurse and medical training has changed with less exposure to the clinical area during training than in the past (DH 2000). Subtle changes in patients' conditions occur and may or may not be picked up by nurses. A nurse may have a hunch about a patient, but not be able to articulate its basis. These indeterminate environments cause uncertainty leading to decisions being reached without supporting signs or data.

As explained in the previous section nurses describe an intuitive sense of change that triggers them to investigate what is happening. Furthermore, decision-making in these uncertain situations has been explored in the literature linking together hypothetico-deductive reasoning with pattern recognition and intuition. Developing on section 2.3.5 and relating intuition to uncertain situations, Cioffi's study (2000) explored the decision-making process when nurses recognised a patient's condition was deteriorating. Her study focused on the role intuition played as nurses responded to their concerns about a patient. Her findings showed that a feeling that the patient was not right was as important in this process as the physiological changes they noticed in the patient's condition. Some authors began to explore how both paradigms, systematic-rational (information-processing) and intuitive-humanistic, are used in clinical practice (Greenwood 2000, Ramezani-Badr et al 2009). The next section discusses how combining both paradigms illuminate the decision-making process within the climate of uncertainty.

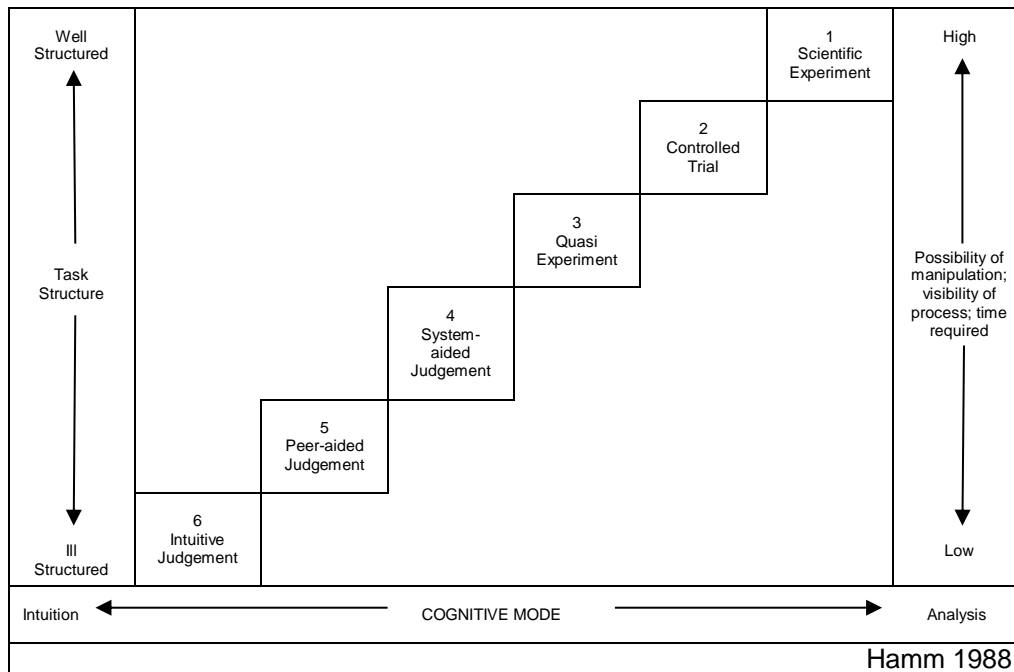
2.4.1 The Cognitive Continuum in Decision-Making

As discussed, much of the literature on decision-making is separated into two main camps; the systematic-rational and the intuitive-humanistic approaches. The cognitive continuum brings together both poles in one model of decision-making. Its guiding tenet is that the type of task in hand influences the type of thinking that the practitioner employs, and importantly, that this match of task and thinking influences the accuracy of the decision made (Hamm 1988). In addition, the experience of the practitioner impacts on the decision made, which we have seen posited in Benner's (1984) novice to expert theory that acknowledges the impact of experience and expertise on the decision-making process. The cognitive continuum is a framework in which different kinds of thinking and different kinds of tasks can be placed (Hamm 1988). The elements, based on Hammond's work, compose cognition, a range of task conditions and a range of modes of practice (Hamm 1988).

The model comprises two poles along the continuum, one being analysis, the other being intuition. In between are the steps that lead from one to the other. The model depicts that a task and the type of decision process are located at either end of the continuum. It assumes that the mode of thinking depends on how well structured the task is. Ill-structured tasks where an individual is operating with minimal support from colleagues or reference to objective information are amenable to intuitive judgement. Well-structured tasks where there is greater time, resource, visible information to make the judgement, and the ability to manipulate the situation are conducted in a more experimental and analytical manner.

This theory builds on the information-processing models by acknowledging the complexity of real life situations and the influence of other variables such as experience, knowledge, responsibility, the individual, context and power (Figure 2.1).

Figure 2.1 The Cognitive Continuum

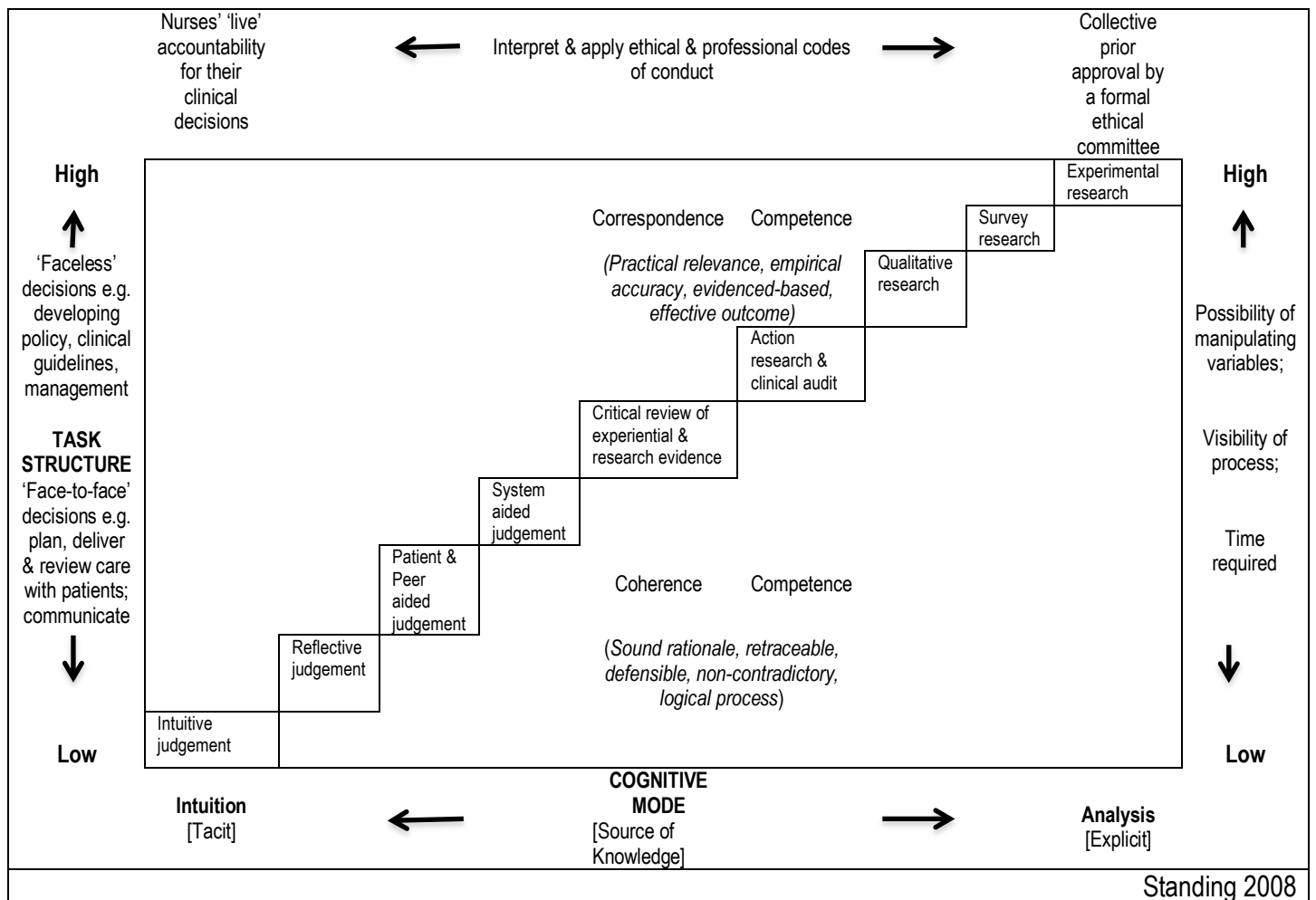


The model is divided into six modes of inquiry with the first, the most analytical, occurring in the laboratory of the hard sciences and the sixth, the most intuitive, occurring when the clinician is operating with minimal or no support and information to hand. This theory provides a general framework in which a clinician may recognise what level of cognition is elicited from a specific task, but it does not offer any instruction on how to improve the process. It shows a correlation between the features of cognition, rather than offering an explanation of the relationship between cognition and task control. Although this model resonates with clinical practice as it brings together both science and intuition, it still leaves unanswered questions in the context of acute care. When staff are faced with an urgent situation, according to this model they are required to assess not only the critical clinical situation, but also their own capabilities and whether they should change their thinking or

the task in hand. How the practitioner discovers or decides which to use remains unclear. The central argument is that people's reasoning is more effective when the mode of thinking they select best fits the task features. However, the time factor alone, in uncertain situations, forces people into a more rapid, intuitive mode of cognition despite where they may consider themselves to be located on the continuum. Currently we do not know how this occurs when a nurse is faced with a rapidly declining patient and more evidence is required to support or discount this model in the context of acute care nursing.

Standing (2008) later revised Hamm's model applying it to the nursing profession and the way she believed nurses make decisions (Figure 2.2 overleaf). This was because the original model was derived from psychology and not the nursing discipline.

Figure 2.2 Standing's Revised Cognitive Continuum of Clinical Judgement and Decision-Making in Nursing – Nine Modes of Practice



The changes made do not challenge the basic premise of the theory but add to the modes of inquiry resulting in nine modes of practice. The modes of cognition are not numbered indicating the flexible cognition that nurses undertake, oscillating in either direction along the continuum. This is in response to the ever changing judgement tasks reflected in the nursing work. Standing (2008) has added a reflective judgement mode above intuitive judgement which acknowledges the importance of reflection in nursing. She has also inserted two modes in the centre that reflect the use of research evidence and audit in cognition, and changed the research boxes to include survey and qualitative research as areas nurses consider when making

decisions. That is the knowledge nurses draw on when making decisions in practice, rather than the knowledge they generate whilst practising.

The revised continuum encompasses patient centred judgement tasks, collaborative, ethical, qualitative, quantitative evidence-based practice and professional accountability which Standing claims supports the complexity of decision-making reported by nurses (Standing 2008). A criticism that can be levied at the revised continuum is that although it reflects the complexity of decision-making it does not give the contextual factors that may influence this process in reality. Both models allow for the oscillation of cognition in uncertain or certain clinical pictures, but the influence of multiple disciplines, different cultures, different levels of expertise of the nurses caring for the patient and the influence of external factors and activities occurring in the ward do not appear to have been taken into account. It is not known how nurses would employ this model in an amorphous and uncertain clinical scenario.

In reality, clinical practice occurs in a 'messy', dynamic complex way (Schön 1988). This is particularly so with the acutely unwell. Professional practice involves reflection-in-action during nursing activities and reflection-on-action in reviewing past experiences (Standing 2008). Schön (1988) conceptualised this by proposing a perspective where problem-solving methods are used. In addition to the 'technical rationality' of scientific information available to professionals, he acknowledged the ambiguity of clinical practice and the role of 'tacit', intuitive knowing as contributing to the way decisions are made. This acted as a critique of the dominant positivist epistemology and began to celebrate the artistry of professional practitioners (Eraut 1994). Schön argued that there are severe limitations to a purely positivist approach when dealing with the complexities of the real world. Practitioners practise using tacit knowledge to inform choices, contemplating past situations, deliberating, performing 'reflection-in-action', i.e. performing the 'art' of nursing within the science. Interestingly, it was the skills acquisition theory of the 1980s which focused the attention of nurses on unconscious or tacit problem solving (Greenwood 2000).

Greenwood introduced an alternative epistemology of practice implicit in the artistic, intuitive processes which some practitioners do bring to situations of uncertainty, instability, uniqueness and value conflict. The reflection he describes is triggered by the recognition that a situation does not feel normal. This could be an unexpected action or outcome, or just an intuitive feeling of unease similar to that frequently reported in Benner's study of expert nurses (1984). A routine situation is then situated outside accepted parameters and identified as uncertain and problematic.

This theoretical area of practice remains to be fully understood, particularly that of decision-making processes in uncertain, ambiguous and urgent situations from the perspective of those undertaking them. An investigation into this area of practice would improve the level of understanding from the perspective of the practitioner and suggests a different approach from those employed by published studies to date.

2.4.2 The Impact of Critical Thinking in Uncertain Situations

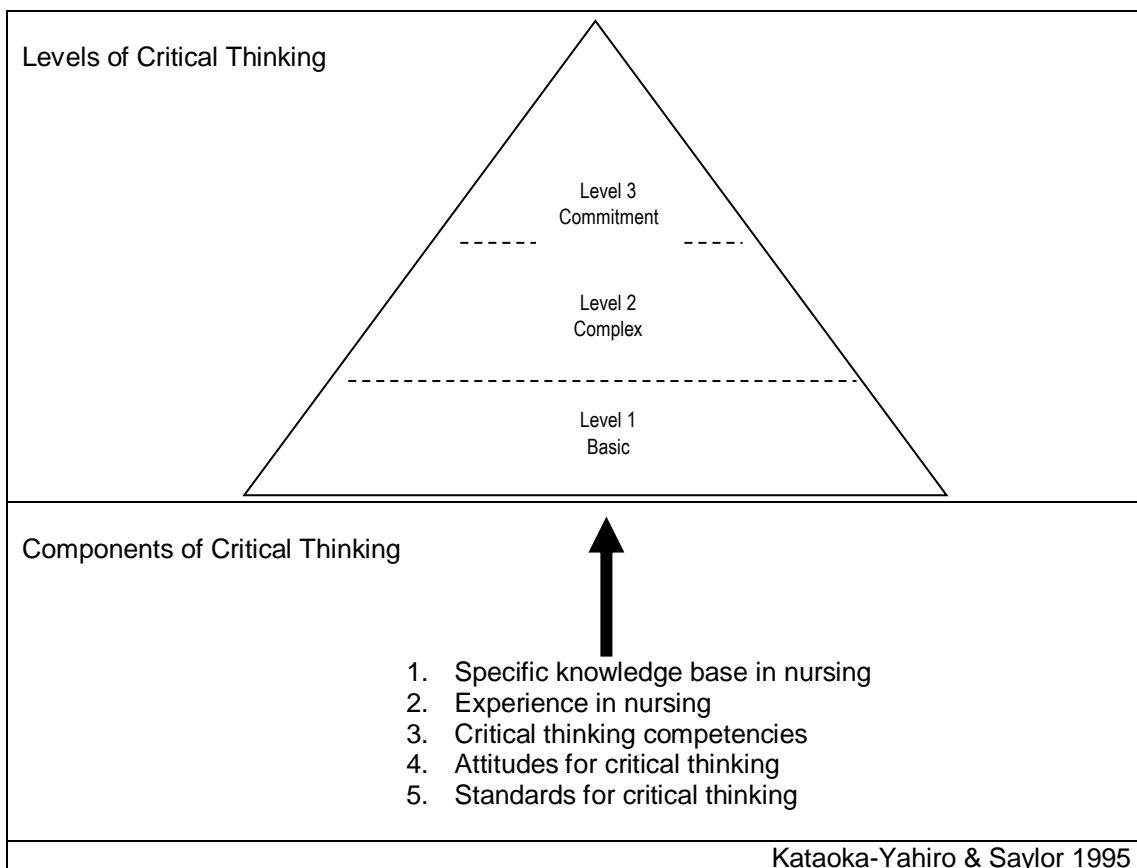
Critical thinking remains the cornerstone of best practice in nursing: it enables individuals to evaluate a number of possibilities before reaching a considered judgement according to Oermann (1998). The concept is challenging because it requires the ability to recall facts, construct them into a meaningful entity, and then apply additional information to the situation on an ongoing basis (Alfaro-LeFevre 1995). The challenge increases when the skill is employed in an environment of uncertainty and urgency. The process conceptualises and applies information from observation, experience, reflection, inference and communication in a technical manner, demonstrating the ability to examine different perspectives and explore alternatives (Oermann 1998, Shin et al 2006).

Nurses need effective critical thinking skills in order to be safe, competent, skilful practitioners in their profession (Kataoka-Yahiro & Saylor 1995). The key lies within the nurses' ability to discern what is relevant and meaningful given the context of the situation. This moves the practitioner beyond simple

assessment and application of facts and rules (Forneris and Peden-McAlpine 2007). The role of critical thinking in acute care nursing is an area worthy of greater focus than the literature suggests and warrants re-examination.

Kataoka-Yahiro & Saylor (1995) used focus groups to develop a taxonomy of the multiple terms used in clinical decision-making and judgement literature and to define the competencies defined in the model below (Table 2.5 overleaf).

Table 2.5 Critical Thinking Model for Nursing Judgment



The levels of thinking relate to the experience of the nurse with those at level 1, the basic level, being at an early step in the development of their reasoning ability, whereas the nurse operating at level 3, the commitment level, being able to select an action based on identified alternatives. The qualities listed below the figure influence the cited levels. The authors however do not provide evidence of the model in practice. This evidence gap undermines its

rigour as a theoretical concept. This suggests an opportunity for real time observation to qualify the theory particularly within the constraints of uncertain nursing situations around a deteriorating patient.

Shin et al (2006) studied the development of critical thinking skills with nursing students in Korea. Using the California Critical Thinking Disposition Inventory³ they showed that critical thinking skills improved incrementally after each academic year of study. However, the study did not demonstrate how this would be applied to patient care except to state that the authors assumed critical thinking to be an essential component in the making of effective judgements. The implications are cited more in the educative arena however the influence of academic study on critical thinking warrants consideration under real life conditions.

Forneris and Peden-McAlpine (2007) reported on a new reflective learning intervention to teach criticality in thinking. They employed the intervention with the aim of improving novice nurses' critical thinking skills during the first 6 months of practice. Their premise was that improving critical thinking skills improved patient outcomes. They stated that novice nurses need support in the clinical setting to incorporate critical thinking along with skill acquisition. The assumption exists that thinking in the real clinical world differs markedly from thinking under structured learning environments. The researchers implemented an intervention that comprised four interrelated components.

The participants were first asked to reflect in the form of a written story on an aspect of their work during the previous week that had either gone very well or resulted in feelings of discouragement or frustration. The second component involved the participant using their story in a reflective interview with the investigator. They then underwent preceptor support where they were assisted while identifying significant aspects of care situations they had experienced. Lastly they participated in leader-facilitated discussion groups.

³ California Critical Thinking Disposition Inventory contains 75 items with forced-choice Likert responses representing an aspect of critical thinking disposition including open-mindedness, inquisitiveness, analyticity, systematicity. A low score represents dispositional weakness; a high score indicates dispositional strength.

The researchers found that these interventions allowed the participants to convert abstract theoretical principles into daily care-giving practices, enabling them to gain a deeper understanding of patient needs. The novice nurses were coached to connect critical thinking with real life practice and thus enable a broadening of their perspectives and the ability to reframe thoughts and insights. The authors recommended this model as a way of teaching and developing essential critical thinking skills. It is not an area that has yet been explored in acute care situations and has not been evaluated with more experienced nurses or when a situation is uncertain.

2.4.3 The Complex Nature of Acute Care

In the acute care ward the ability to make pertinent and effective decisions about a patient in a timely fashion is crucial to ensure effective provision of care and management. Decisions regarding a deteriorating patient incorporate certain characteristics depicted in Table 2.6, thus demonstrating the multifactorial nature of the clinical setting (Currey and Botti 2003).

Table 2.6 Characteristics of Acute Care Decisions in the Clinical Environment

- Decisions are complex
- Information is ambiguous and uncertain
- The quantity of information to consider is large
- Clinical problems are poorly structured
- Decision outcomes are iterative because they require further evaluation
- Decisions have high stakes and consequences ensue for both decision maker and patient
- Decisions can be made individually or in consultation with others
- Organisational goals and cultural norms must be considered
- Time constraints exist

Adapted from Currey & Botti 2003

The way professionals make decisions has been conceptualised in many ways by many authors. These studies often used simulated controlled

settings to examine the phenomena and did not appear to incorporate elements of the human condition such as stress and the personal interactions that form the background and backbone of many uncertain clinical situations (Bucknall 2003).

In acute care the nurse first encounters a clinical problem or diagnostic task. The complexity of the task influences the ensuing decision-making process (Hamers et al 1994). The more complex the task the more potential for a deleterious outcome when making the decision. Decisions are considered complex when numerous attributes must be considered by the decision maker in a short space of time (Currey and Botti 2003). Tanner (1984) describes the determinants of task complexity in terms of cues: the number and clarity of the cues, whether cues overlap in addition to the uncertainty of the situation. Irreducible uncertainty increases the task complexity (Hamers et al 1994). Staff workloads, time constraints, time of day and the physical layout of the clinical area have also been highlighted as factors affecting the decision-making process (Bucknall 2003). Uncertainty in acute care can lead nurses to use cognitive shortcuts in the decision-making process known as heuristics, or 'rules of thumb'.

Heuristics can be both useful and necessary but can also introduce a series of biases into decisions when selecting or interpreting data. They can also lead to the premature closure of a clinical problem (Thompson 2003). This may result in inaccurate decision-making. The most common errors are overconfidence in the correctness of the practitioner's knowledge and using hindsight whereby the practitioner reasons backwards. Experience drawn from previous similar situations is given precedence over garnering objective and current patient data. How nurses use heuristics in the acute care world has not been fully explored to date. An examination of its currency in uncertain scenarios may elucidate how nurses reach their decisions. To do this requires an approach that enables the nurse themselves to explain from their perspective what and how they are thinking. This cannot be achieved through a rationalist paradigm, it demands a different epistemological approach that reveals the phenomenon.

Smith et al (2007) examined the contextual factors that affected acute care physiotherapists when caring for cardiorespiratory patients whose condition might decline. Using observations in practice and semi structured interviews a number of contextual factors were identified. These were around three broad themes:

- i. Factors related to the nature of the decision itself
- ii. Factors related to the context in which the decision occurred
- iii. Factors related to the physiotherapists themselves.

The authors showed that the more complex the decision the more in-depth the reasoning process with deliberation increasing with the level of uncertainty and the critical nature of the outcome. In acute care the implications are that increased deliberation time may pose delays in reaching the decision required. Rattray et al (2011) examined which professional, situational and patient characteristics nurses judged to be worthy of referral and reflected patient acuity. Using a factorial survey design the authors requested participants to respond to vignettes describing a situation and patient condition. Participants were registered nurses working in acute care areas. They found that nurses appeared to process complex information appropriately when making decisions about the acutely unwell. The use of the track and trigger system emerged as the single most important predictor of referral behaviour. Other predictors, of both deciding to refer a patient and in assessing patient acuity, was abnormal physiological variables. In contrast to other studies these findings did not show context (shift activity and staffing for example) as predictors. Smith et al (2007) recognised that decision-making in acute care can be steeped in contextual influences due to its fraught and mobile nature and that the more experienced practitioner exerted greater control over the contextual factors.

Franklin et al (2011) observed the decision-making that physicians undertook in an emergency department. They focused on task transition. They discovered that there were three main types of decision. Decisions were either planned, opportunistic or forced upon the physician, for example, when

a pager alarmed. Shifting from one task to another and the inherent speed of decision-making presented potential areas for error. The authors claim that at present there is no cognitive support for such decision-making, and therein lies the clinical risk. Acute care nursing poses similar challenges. A nurse may be caring for 6 or more patients and also having to care for at least one seriously ill patient amongst that caseload. Task transitioning occurs continually and requires speedy decision-making. Gaining an understanding of the factors relating to and influencing this type of decision-making may elucidate where the risks exist and thereby enable them to be addressed and optimally minimised.

Variability in the decision-making process can be due to several factors including the decision support available from colleagues (Currey and Botti 2006). In fact collegial interactions have been reported to assist with nurses' decision-making (Benner 1984). Hoffman et al (2004) used questionnaires to examine what influenced decision-making among a variety of nurses of different specialities. They concluded in their small study that education and experience were not significant factors but the professional orientation of the support accounted for variability in decision-making. The authors recognised that their conclusions were preliminary given the small sample size and single site used. The study points out that further observation of the use of support in decision-making may be useful.

Andrews and Waterman (2005) undertook a grounded theory study, attempting to capture the moment when a patient deteriorates in a medical and surgical ward. Although very little deterioration was observed, the authors were able, via semi-structured interviews, to generate a number of theories about the way nurses 'packaged' deterioration and attempted to manage and communicate it. They describe in detail how deterioration was detected, and how complex and difficult this process was. Also described was the difficulty nurses then have in communicating this to medical staff, reinforcing the importance of teamwork. This work also supports that of Benner et al (1999) by suggesting that intuitive knowing is a large part of the process, with knowledge and experience also being important factors.

Andrews and Waterman's (2005) study is the first to address this phenomenon in general ward settings with deteriorating patients. The weakness of this study in contemporary terms is that it was undertaken prior to the advent of critical care outreach teams and the researchers in the field observed very little deterioration.

Hancock and Durham (2007) describe the decision-making process used by a consultant nurse working in a critical care outreach team with a specific case where a patient became critically ill on a ward. Again the ambiguity and complexity of decision-making were highlighted. They also noted that with critically ill patients in a ward environment there is very little information on which to base judgements, so practitioners rely heavily on powers of observation and the cues that are available. The process was like 'piecing together a jigsaw'. The nurse drew on different sources of knowledge, such as practical, experiential and intuitive knowledge all at different times. Within this process, a number of theories and models were reflected such as the information-processing model, Hamm's Cognitive Continuum Theory (Hamm 1988), and Schön's reflection-in-action theory (Schön 1988). Their reflective account offers insight into the multiplicity of processes that occur with critically ill patients within ward areas. They concluded that more research is required in this area.

2.4.4 Summary

Decision-making in uncertain situations has been explored by several authors. Researchers have shown that a variety of contextual factors affect decision-making at these times and different paradigms of cognition are used by professional practitioners. There still remains a gap in the literature that explains how nurses working on acute care wards derive support for and manage their decision-making when working in uncertainty. An epistemological stance that investigates this from the perspective of those nurses is required. This necessitates a way of knowing that seeks their view point, their thinking and what influences their reasoning in uncertain clinical situations illuminating the problem solving strategies they use when reaching

a decision and what actions to take. This may enable us to gain greater understanding of the phenomenon and what factors influence the care of these patients.

2.5 Decisions Made in Urgent Situations

The literature surrounding decision-making in emergency situations is sparse. Few authors have captured this phenomenon and even fewer have captured it in clinical practice as it happens. This may be because of the practical, logistical and ethical dilemmas in researching people at their most vulnerable. More recently studies have been carried out using simulation to capture the processes in play at these times.

Kinsman et al (2009) examined factors that may influence the way nurses detect and respond to deterioration focusing on their situation awareness. Using simulation, 51 final year nursing students in Australia undertook two video recorded simulation sessions and completed a knowledge questionnaire pre and post scenario followed by a reflective interview. The study showed that the students did not use a systematic approach in their assessment of the patient and the unfolding scenario. The detection of signs seemed to be haphazard with some important cues being missed due to fixation on others. As the deterioration worsened participants undertook fewer routine assessments in response to the scenario. At follow up some commented on the difficulty of making decisions and assessments using a mannequin and said they would have acted differently in the real clinical area, such as asking for help. Implications for the practice and education of nurses suggest careful preparation when faced with such scenarios in the acute care ward environment. This study resonates with other work around poor detection and response to deterioration, but due to its simulated nature it may have not illuminated all of the factors that a study using fieldwork in the acute care clinical setting.

Stress is a contextual factor that has been shown to hinder the decision-making abilities of nurses in an intensive care unit (Bucknall and Thomas 1997, Cioffi et al 2010). The additional monitoring and interventions required can be stressful to a ward nurse who may not feel proficient in the care of the critically ill patient. Emergencies can encapsulate a range of complex tasks that require rapid decision-making. In turn they can increase stress and anxiety in the practitioner inducing the desire to want complete tasks faster increasing the likelihood of error (Bond and Cooper 2006, Kinsman et al 2009). This is particularly so if the task is new to the nurse, which in the situation of a patient becoming seriously unwell on a ward, may well be the case. Some studies have examined the way students make decisions (Cooper et al 2010, Kinsman et al 2009, Endacott et al 2010, Cooper et al 2012). This series of studies, taking place in simulated conditions, highlighted the level of stress exhibited by the students when they were forced to make clinical judgements alone rather than with collegial assistance. Even when the cues became more obvious, the performance of the participant decreased as their anxiety heightened. Little remains known about the cognitive processes and actions a ward nurse undergoes during emergency incidents and how these can be improved resulting in safer and more effective patient outcomes.

Several studies used 'thinking out loud' as a method to capture thought processes, however there are weaknesses with this method in that the unnatural process of speaking thoughts alters the content and process of the thought (Elstein et al 1978). Participants can feel constrained and not articulate their thinking very well. There is a danger that their thinking is expressed in a more linear way than actually occurs due to the pressure of verbal expression.

Decision-making in urgent situations is a sparsely reported on phenomenon. Andrews and Waterman (2005) attempted to capture it, but did not witness any rapidly deteriorating patients to utilise. Studies have relied on simulation or reports after the event. The way nurses cope and act when in this situation is poorly understood. Yet we know from the early work published by critical

care authors during the 1990s and 2000s that it is an important concept to grasp and consider in order to improve care standards of these patients (Audit Commission 1999, NCEPOD 2005). Greater understanding may help us to make the changes required to equip nurses with the knowledge and skills they need to effectively carry out their duties when making rapid decisions in urgent clinical situations. A new epistemological approach gleaned via the perspective of the nurses would illuminate the complex factors involved.

2.6 Summary

When caring for unwell patients nurses are often faced with complex data when having to decide when to call for help in difficult clinical situations. It is crucially important to improve understanding of such clinical decisions if we are to develop an appropriate solution. There is little in the current literature that offers persuasive evidence that either the humanistic-intuitive approach or the systematic-rational approach presents a solely convincing explanation for the decision-making processes of ward nurses who are engaged in caring for deteriorating patients. Due to the paucity of studies in this arena there is limited understanding of the range and depth of the contextual factors that influence this process. Although fundamental to providing quality of care, the reasoning within the decision-making process has yet to be fully described in nursing literature (Fonteyn and Ritter 2000).

This literature review identified various gaps in the current knowledge, detailed above, about how nurses make their decisions in acute care settings. Over a decade after McQuillan et al (1998) coined the term 'suboptimal care', there still appears to be a problem with the identification, clinical reasoning and subsequent management of deteriorating patients. Very few studies have examined what happens in the clinical environment prior to the input of a senior colleague or critical care expert. There is a dominance of simulation and review studies, also studies set in other nursing and professional specialties. Clinically based real time studies are required to explore the effect of the environment on decision-making (Lamb and Sevdalis 2011).

Gaps exist in the literature related to our understanding of real-world acute care decision-making. Firstly, simulation has questionable reliability and validity in real clinical setting. Secondly, there is a lack of empirical research on decision-making prior to the arrival of assistance to the nurse. Thirdly, there is a dearth of research carried out in real time in the clinical area itself. It is therefore timely and important to investigate the phenomenon in the clinical environment.

In summary, both scientific and interpretive approaches have been used previously to study or illuminate different aspects of the clinical reasoning process. My research utilises the interpretive tradition, namely grounded theory, to explore how nurses make decisions in clinical practice when faced with a patient whose condition is declining. Features of interpretive research important for this research are the ability to explore complex human interactions in the real world of clinical practice as they occur. Chapter 3 presents a detailed description and rationale for the approach adopted in this research.

CHAPTER 3 – DESIGN AND METHODOLOGY

3.1 Introduction

This chapter sets out the methodological choices that were made in order to engage with the issues that surround clinical reasoning and decision-making by nurses when caring for a deteriorating patient. These choices relate to data collection and analysis. The guiding objective of the study was to uncover an explanatory theory underpinning the decision-making process utilised by nurses when caring for a deteriorating patient.

First, the philosophical challenges presented by the concept of reality within the study parameters are examined. Then, the study's origins in pragmatism are defined and how this philosophical stance provides a context to illuminate the phenomenon. The theoretical perspective of symbolic interactionism is discussed with reference to the epistemological position underlying the enquiry. This is followed by a rationale and demonstrable defence of grounded theory with dimensional analysis as the choice of methodology. The key issues of trustworthiness encompassing credibility, transferability, dependability and confirmability are explored. Throughout the chapter I interpose my reflections on the methodological choices I made, including my ontological position at the start of the study and how this influenced the decisions I made.

3.2 The Philosophical Challenges

In order to ensure a strong framework it was imperative that the chosen research paradigm encompassed a '*fit*' with the epistemological and methodological positions determined by the stated aims of the study (Crotty 1998, Gray 2004, Grix 2004, Mills et al 2006, Birks and Mills 2011). Five components framed the study design (Crotty 1998, Maggs-Rapport 2001).

These comprised:

Ontology - What is reality?

Epistemology - What counts as knowledge?

Theoretical Perspective – What is the philosophical stance informing the methodology?

Methodology - How can we understand reality?

Methods - How can evidence be collected about reality?

Caring for an acutely ill patient who is deteriorating forces the practitioner through a range of complex activities, thought processes, decisions, communications and interactions within a dynamic environment. The nurse develops a different therapeutic relationship with every person (Rolfe and Gardner 2005). My methodological decisions had to address these complexities and I sought the most effective way to understand the meaning of the nurses' social interactions and decision-making processes (Hammersley and Atkinson 1995, Crotty 1998, Schwandt 2000, Boyd 2001).

My background in critical care had situated me towards the dominant paradigm of positivism as most critical care research encompasses quantitative research methodologies. I recognised that a study with the goal of achieving a deeper understanding of the contextual factors influencing the decision-making processes in an acute care setting would demand a different approach. I therefore sought an alternative epistemology rather than tread the traditional positivist path prevalent in healthcare research (Carper 1978, Pyles and Stern 1983, Benner et al 1999, Smith 1987, Munhall 2001).

3.2.1 Social Construction of Reality

The goal of this study was to capture the complex reality of decision-making and make convincing sense of it (Strauss 1987). The term social construction of reality refers to the theory that the way we present ourselves to other people is shaped partly by our interactions with others, as well as by our life experiences. How we were raised and what we were raised to believe affect

how we present ourselves, how we perceive others, and how others perceive us. In short, our perceptions of reality are coloured by our beliefs and backgrounds. Nursing involves a spiral of connections between patients, visitors and colleagues. Therapeutic interventions are based on combinations of judgements. These interactions tell a story about human interplay and relations. My focus lay in uncovering the contextual factors that impacted on the nurses' decision-making environment. In order to understand and capture the fluid nature of these interactions the study had to take place in the real world of clinical practice. I was seeking to discover '*what all is going on here*' (Schatzman 1991). The notion of objectivism found in the positivist paradigm was rejected when I chose to position myself with the participants and construct the emerging meanings with them (Jones 2003, Andrews 2004). This viewpoint, however, is not simply subjective. The meanings in this world of acute care are constructed during the process of action rather than consciously created by the participants: the meaning is 'made' (Crotty 1998).

The explanatory logic that frames this story is developed from a perspective in context, under conditions involving actions and processes with consequences for the patient or nurse (Schatzman 1991). Acute care is a complex world and comprises a multiplicity of realities which deny the existence of an objective reality. Social realities are shared because nurses work in teams and their work is influenced from many sources and is multifactorial. I therefore located myself as the researcher in the clinical environment. By being present in the field, experiencing it and sensitising myself theoretically to its nuances allowed me to guide the interviews that comprised the data. I undertook this fieldwork in medical and surgical wards of a district general NHS hospital Trust. My intention was to capture and explore the different interactions between the nurses, their colleagues and the patients. My thoughts were recorded as analytical memos which would act as prompts to inform and develop a conversation with the participants following the fieldwork.

Data were collected from detailed personal reflections and explanations given by the nurses and other key hospital staff during semi-structured interviews. These were digitally recorded, enabling continuous review, so that theoretical

analysis of the data could be undertaken. Dimensional analysis techniques were used to understand and analyse the data (Schatzman 1991). The technique of constantly comparing data by conjuring up dimensions, making memos, patterning across dimensions via explanatory matrices until the central organising phenomenon was revealed was undertaken throughout the study. Emerging dimensions and their salience were revisited with the participants wherever necessary for clarity, further investigation and verification. During the research process data formed the foundation of the substantive theory and constant analysis generated the dimensions that were created (Kools et al 1996). These techniques operationalised the tenets of social construction of reality by examining the social processes occurring in the field, revealing the factors that influenced nurses' decision-making.

Throughout the study I acknowledged that my position as researcher was not a neutral one. Having spent 25 years working as a nurse in intensive care and 6 years working on acute care wards as a critical care outreach nurse, the environment and ward routines were familiar territory. Grounded theory allows the perspective of the researcher to be acknowledged and moreover involves the researcher in data analysis whilst collecting data (Bryant and Charmaz 2007). Indeed, I used this awareness to inform and shape further data collection. Schatzman (1991) actively encouraged the conjuring, assembly and patterning of data as it is conceived. He advocated natural analysis and accepted that the perspective of the researcher was integral to discovering the properties of complex issues. He encouraged the researcher to view data from different perspectives and be sensitive to the phenomenon being studied. I inductively 'sensed' a concept in the data, then deductively explored it thus forming a more fully abductive stance. It was necessary for me to clearly accept my own experiences, which I did through memo-ing. I then integrated these to compare with the emerging data. I recorded how I merged, shaped, influenced and responded in the field as perspectives shifted and connections in the data were made.

3.2.2 Pragmatism

Pragmatism is based on the ideas of Dewey and Mead who viewed reality as that of interacting perspectives (Mead 1934, Robrecht 1995, Heath and Cowley 2004, Reichertz 2007). It began as a philosophy intended to mediate between science and belief. It examines the practical consequences of a hypothesis using controlled lines of inquiry. Central to this study was how nurses made decisions about patients. This included how they decided to refer to more senior staff and doctors, and how they interacted with one another and other colleagues during the decision-making process. Referral is a social interaction; it is a social process. This has parallels with the pragmatist philosophical origins of Strauss's Chicago school doctrines. Pragmatism views reality as characterised by indeterminacy, fluidity and multiple interactions between people who are active and creative (Bryant and Charmaz 2007, Scholes 2011). It is a philosophical tradition centred on the linking of practice and theory where theory and practice are not considered separate entities. In acute care, nurses have to work with other professionals in a context of frequently changing clinical scenarios. Pragmatism seeks reference to efficacy, the everyday nature of reality and an examination of the consequences of any action. It is a philosophy whose essence is practice related and therefore resonates with the research question.

We know from the decision-making literature (chapter 2) that clinical reasoning involves problem solving. Pragmatism is an epistemology that states knowledge is gained through problem-solving where theory is extracted from practice, and applied back to practice (Strübing 2007). Furthermore, in pragmatist philosophy meanings emerge through practical actions to solve problems (Bryant and Charmaz 2007). It has been described as a philosophical approach that has flexibility, matching the best methods to the research question rather than stipulating a rigid approach (Whittemore et al 2001). This reflects the methodological approach I chose to gain and discover an understanding of all considerations involved in the phenomenon of decision-making and clinical reasoning with deteriorating patients (Schatzman 1991). Lastly, central to the pragmatist stance is whether the

theory has any usefulness shown by its practical consequences (Star 2007, Strübing 2007). This was important to me as one of my objectives in this research was to identify which contextual factors in a ward environment promote good quality care for this group of patients (defined as timely intervention when a patient's condition deteriorated).

Pragmatists see facts and values as linked rather than separate entities. They also see truth as relativistic and temporary (Bryant and Charmaz 2007, Scholes 2011). I have taken the stance that reality is not a single objective external substance. It encapsulates many perspectives that require understanding in the context of acute care. Clinical situations demand a rigorous approach to care, often supported by protocols and systematic procedures. However, clinical situations also become unpredictable, and they shift. I agree with Strübing (2007) who explains that theory is always linked to practical problems, 'practical' in this sense being the all-encompassing understanding of processes, patterns, relationships between the interacting perspectives as played out in the clinical setting. It was important for me to remain close to the studied 'world' and to develop theoretical concepts that showed processual relationships in the field. This perspective sat closely with pragmatism.

3.2.3 Symbolic Interactionism

The term symbolic interactionism was coined by Blumer (1969) who was a student of Mead's and continued his work in sociological philosophy. Blumer echoed Mead's stance stating that human beings act towards things based on a series of interactions they have and the meanings these have for them (Robrecht 1995). Blumer (1969) summarised symbolic interactionism using three main constructs:

- i. *Meaning*: humans act toward people and things based upon the meanings that they have ascribed to those people or things. Symbolic interactionism holds the principal of meaning as central in human behaviour. It doesn't matter what is actually true or not true. People

react based on what they believe to be true (and thus meaning is symbolic and not actual).

- ii. *Language*: the means by which to negotiate meaning through symbols. We give things, and events names (labels) and it is through engaging with others that humans come to identify meaning, or naming, and develop discourse. In other words, because meaning is symbolic, it changes, adjusts, and adapts based on our interactions with other people. Our knowledge is constrained by our ability to name, and thus define (negotiate the meaning), ourselves and the world we live in.
- iii. *Thought* (taking the role of the other): this modifies each individual's interpretation of symbols. Thought, based on language, is a mental conversation or dialogue that requires role taking, or imagining different points of view. We have a constant inner monologue that reimagines and reflects upon our perceived reality.

Acute care nursing within the ward involves a series of unique symbolic systems. These systems require interpretation and understanding. To gain insight into the nurse's clinical reasoning there is a need to detail the symbolism inherent in, for example, their knowledge and experience, or their attitude to more senior staff as they care for the patient and interact with colleagues. Benzies and Allen (2001) state that symbolic interactionism traditions are concerned not only with knowing the individual's point of view, but also with understanding the process by which these viewpoints develop. Unravelling these aspects of care enables me as the researcher to decipher the meaning of the interactions and their potential impact on patient care.

Central to symbolic interactionism are the concepts of 'I' and 'Me' (the self-concept, self as an object), role-taking, '*looking-glass self*', and definition of the situation (Heath & Cowley 2004). Symbolic interactionism is described as people building their views of themselves and others because of interactions they have had, the way they have been perceived, and have treated each

other (Jones 2003, Gray 2004). All participants who took part in this study would have a concept of themselves as health professionals as they have grown and developed during their (in some cases neophyte) careers through many previous interactions. Their own individual perception of their role would mould their accounts and stories. This symbolic interactionist view of 'self' is an important perspective when seeking to understand their thoughts and actions in the context of caring for a deteriorating patient. Symbolic interactionism emphasises the placing of the researcher in the world of the participant in order to see things from their perspective. This led me to consider grounded theory as an appropriate methodology, stemming from a congruent philosophy. Moreover, using grounded theory allowed me to explore the participant's 'self' image through the interview process increasing my understanding of the impact of their experiences on the way they reason and make decisions.

Given the complexity of the phenomena investigated it was impossible to view all the realities and systems in isolation. Their individual parts could not be predicted and needed to be viewed as a whole acknowledging the interactions and different perspectives that were created in the setting, not fragmented from each other as in positivist inquiries (Lincoln and Guba 1985). Symbolic interactionism sits philosophically with the ontological and epistemological position I have taken which is that multiple realities exist and meaning is socially constructed. It is closely related to pragmatism and aligns with the philosophies emanating from the University of Chicago where Schatzman and his colleagues practised. The Chicago School of Sociology established sociological ethnographies (Strübing 2007). Mead had great influence on Strauss who worked alongside Schatzman and drew on Mead's philosophical and epistemological contributions on interactionism.

Symbolic interactionism assists with an understanding of the participants' actions and the meanings that can be attributed to them in their context so that their world can be interpreted. For this study it contributed to a valid and comprehensive review of the particular theoretical and practical concerns when caring for acutely unwell patients. I believed that through sensitising

myself in the field whilst shadowing nurses whose experiences were then discussed in interviews and focus groups, a shared understanding could be co-constructed with the participants. Schatzman posited the notion that human beings act towards things based on what they mean to them (Kools et al 1996). Through adopting symbolic interactionism as a philosophical underpinning for this study, I was able to understand how participants' behaviours were shaped through social interaction in the ward, i.e. their context (Aldiabet & Le Navenec 2011). This research is based on the concept that theory comes from practice and therefore relates pragmatism to symbolic interactionism.

3.3 Methodology - Grounded Theory

This section sets out the rationale for using this particular approach. Grounded theory seeks to construct a theory about the issues in people's lives that they perceive as important (Mills et al 2006). These issues emerge from stories as told to the researcher. Originally crafted by Glaser and Strauss this methodology allows theory to be derived (grounded) from the data themselves (Glaser and Strauss 1967, Robrecht 1995, Walker and Myrick 2006, Glaser 2010). With little already established about the chosen area of study, a grounded theory methodology had appeal because of the fluid nature of its explanatory power (Mills et al 2006, Birks and Mills 2011). There is thus evident compatibility between research method and research question which demanded a particularly flexible and inductive approach.

Grounded theory is a systematic qualitative research approach where theory is discovered from data (Aldiabat & Le Navenec 2011). A key feature is that the researcher stays close to their study world and uses analysis early in the data collection process in order to focus further data collection, continually refining and checking emerging conceptual categories. This iterative, constant comparison is the cornerstone of grounded theory (Chamaz 2008).

Classical grounded theory has three main characteristics (Bryant and Charmaz 2007, Andrews 2012, Glaser 2012):

- i. It is relevant in studies that have diverse areas and disciplines and in particular where there is little '*a priori*' knowledge
- ii. It uses constant comparative analysis where data collection and data analysis are concurrent making use of reflective memoing, looking for patterns in the data and creating conceptual frameworks
- iii. It generates theory from uncovering what the participants' main concerns are, and how they resolve these.

This study draws on grounded theory methodology using dimensional analysis (explored later in section 3.4). It allowed me to discover '*all that is involved*' and to view what the participants saw as their reality to explain the phenomenon of decision-making and clinical reasoning when caring for deteriorating patients (Schatzman 1991, Stern 1994). Schatzman moved away from the prevailing view of grounded theory during his time working with Strauss at the Chicago School (Gilgun 1993). Schatzman (Schatzman and Strauss 1973) believed that everyone has the ability to undertake analysis (natural analysis) and that the process requires a different order to study participants so that the 'whole' can be revealed. The assumptions he advocated were:

- i. A person can take a perspective on oneself, and act towards himself
- ii. A person can hold several perspectives on himself as well as other things, people and events, and in new situations create more perspectives
- iii. One's own perspectives are developed through social situations and processes one has been involved in and with which he can identify
- iv. These perspectives become conditions for a person's own actions, meaning what motivates his actions are of his own making.

The choice of method to study participants requires the researcher to get close to those being studied in order to best comprehend their actions.

Schatzman says the researcher must be present at the location to watch and also listen to the symbolic sounds that characterise the observed interactions. Speaking with the participants will reveal the nuances of meaning from which their perspectives and definitions are forged. He developed a way of undertaking data analysis that built on the classical grounded theory principles first described by Glaser and Strauss (1967). This method of dimensional analysis provides an understanding or theory of all considerations seen as involved in the phenomenon and as constituting the 'whole' of it (Schatzman 1991). Schatzman (1991) described a 'conjuring' of dimensions where the researcher undertakes creative abstraction of data using conceptual labels to illuminate phenomenon and subsequent dimensions. As new aspects are conjured the 'whole' and the cognitive problems change in a continual process of analysis and definition. This results in an overarching explanation that can tell the story.

The multi-layered interactions that take place in the acute care environment are shaped and driven by the shifting attitudes of the key players. Schatzman (1991) supports the notion of multiple perspectives whose attributes must be stated, properties defined and the relevance and salience of each assigned to a dimension. The reflexive stance of dimensional analysis where the researcher inductively builds an idea, then deductively 'grounds it in' allows for shifts in perspectives to explore the phenomenon (Gilgun 1993, Scholes 2012). As a nurse with considerable experience at ward level, the self-reflexive approach acknowledges the difficulty in distancing oneself from the analysis and writing. This conscious self-awareness allows the researcher to embrace the experience and harness it to build emerging theory. The conjuring of dimensions drives an inquiry into the parts, attributes, interconnections, context, process and implications of the study (Schatzman 1991). The patterning of the dimensions will build towards a theoretical explanation of decision-making and clinical reasoning when caring for a declining patient.

Grounded theory and dimensional analysis benefits the researcher by offering different analytical lenses through which to view the data. The creation of the

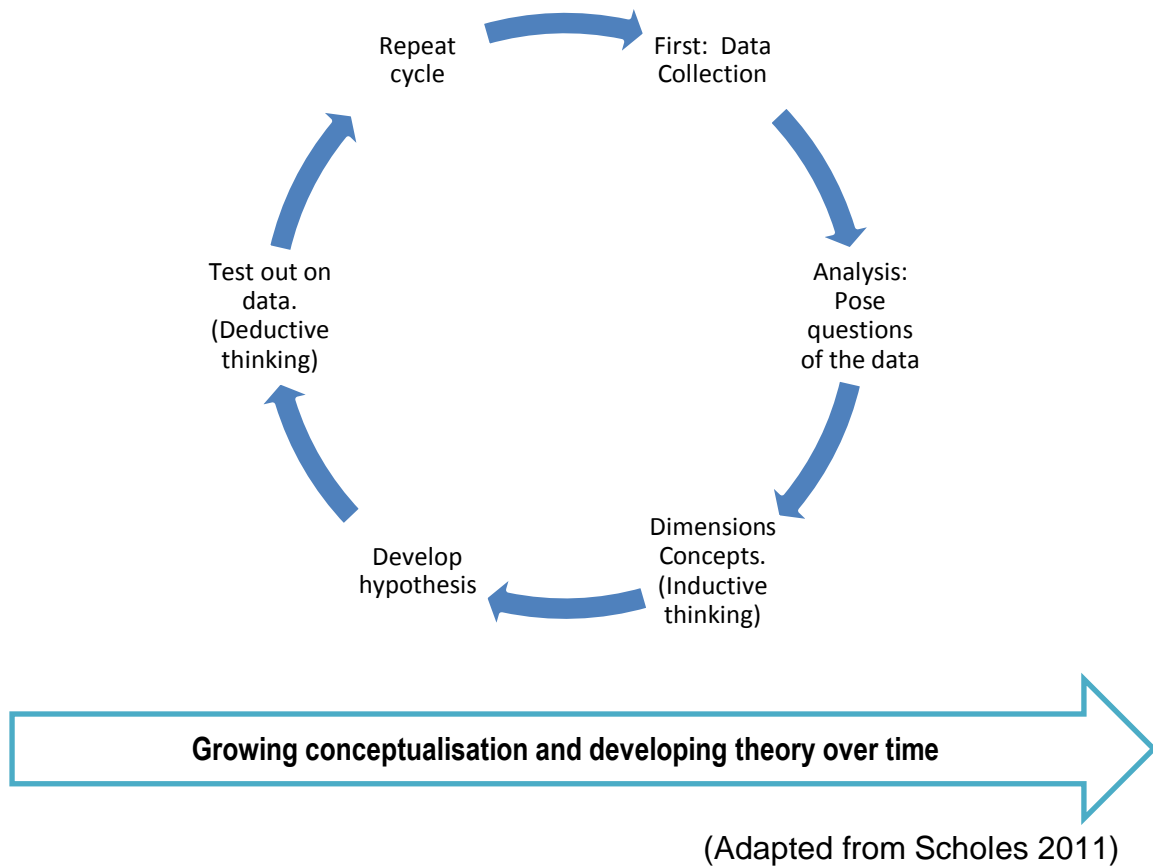
dimensions and the active acknowledgement of the differing perspectives, including mine as an experienced critical care nurse, using the techniques described by Schatzman (1991) and Schatzman and Strauss (1973) helped me to systematically generate the substantive theory that explains the clinical reasoning and decision-making processes with deteriorating patients. The next section explores some of the history and key debates within grounded theory.

3.3.1 The Theoretical Background to Grounded Theory

Grounded theory provides a framework for social research when little is known about the subject to be studied (Glaser and Strauss 1967). From initial investigation into the literature about the care of the deteriorating patients (chapter 1), it is evident that little substantive attention has been paid to exploring the decision-making processes prior to referral to another professional. Little '*a priori*' knowledge exists on the subject demanding an inductive approach to theory building. This is important because it minimises the influence of researcher preconceived ideas and offers an approach that illuminates the decision-making processes from the perspective of the participant, discovering and building theory through constant comparison and shifting backwards and forwards through the data during data collection.

Grounded theory is a tool to explain a social process. All data are potentially significant (Glaser 2012). The constant comparative method fundamental to grounded theory enables the researcher to 'to and fro' within the data testing and re-testing emerging hypotheses and their relationships and patterns across concepts (dimensions). I conceptualised this from the methodological literature as abductive reasoning (Figure 3.1 overleaf).

Figure 3.1 The Use of Abduction in Data Collection and Analysis



The process of abduction required a moving in and out of the data and study setting. Following a period of data collection interpretations were inductively shaped through memoing, asking questions of the data and conjuring dimensions. I then returned to the wards and collected more data and made further comparisons, gradually leading to the emergence of dominant dimensions. It enabled the divergent to be identified and tested against other dimensions for salience. When it became apparent that no new concepts were being identified, I considered saturation to have been reached. This shaping of the data enabled me to move analysis beyond description to a conceptual theoretical level whilst always returning to the practice setting as the theory developed, a key aspect of grounded theory. This is why the research took place on the ward itself, in the midst of practice taking place and did not rely on retrospective recollection of events.

The initial inductive process to gather and interpret data (Glaser 2012) allowed the nurses complete freedom to speak from their perspective about their own experiences. There were no boundaries, restrictions or pre-determined assumptions at interview. This fostered an unfiltered experience of the world of acute care which is unpredictable. Relationships and interactions occur on many levels between many different health care professionals. These interactions may be visible, but not transparent. The role of the researcher is to actively seek out individuals who are part of these relationships, but currently unknown. Key players may remain unknown until data is generated and analysed simultaneously from the participants. Judicious memo writing acts as a conceptual trigger and leads to methodological decisions which guide the direction of the study (abduction). The enquiry can travel different paths which arise from the data themselves rather than being pre-determined at the outset.

Grounded theory has the potential to develop explanatory theories about social patterns, discovering the dominant processes, the behaviour of the people involved and how they deal with their issues (Birks and Mills 2011, Andrews 2012). Whilst other qualitative methods support enquiry into patterns of behaviour, interaction and perceptions, it is the development of a theory that can provide an authoritative explanation for these patterns that is key. This is a factor that distinguishes grounded theory from other qualitative approaches to research which at best may result in a thick description (Glaser 1978, 2010a, 2010b). Grounded theory was also the methodology of choice given that it acknowledges the viewpoint of the researcher welcomes the perspectives of the researcher and uses the researcher as a central part of the theory development (Glaser and Strauss 1967, Schatzman 1991). The attraction for me was that my many years of critical care experience that became part of the enquiry journey and my perspective were both given validity using grounded theory methodology.

3.3.2 The Historical Background to Grounded Theory

This section explores some of the debates that transpired during the evolution of grounded theory and their relevance to this study and its methodological decisions. Aldiabat & Le Navenec (2011) and Birks and Mills (2011) describe the different ‘moments’ of grounded theory where significant developments altered grounded theory and the way researchers approached it. These are depicted in Table 3.1. These key differences that developed over the decades influenced my methodological choice.

Table 3.1 The Decades of Grounded Theory

	Decade	Developments
1	The Discovery Decade 1960 - 1970	Glaser & Strauss developed grounded theory methods publishing their initial book: <i>The Discovery of Grounded Theory: Strategies for Qualitative Research</i> (1967). Philosophically post-positivism is the dominant school of thought where there is an assumed reality worth discovering through detached observation although that reality may be flawed.
2	The Development Decade 1970 - 1980	Blurred genres. Characterised by researchers questioning their place through research texts. Strauss published with Schatzman a guidebook on fieldwork (Schatzman and Strauss 1973). Schatzman described in this text his method of analysis although did not at this stage label it as dimensional analysis (Schatzman and Strauss 1973, Scholes 2010). Glaser wrote in 1978 his book on theoretical sensitivity (Glaser 1978), which began to open up key differences between the Glaser and Strauss’ approach. Where Strauss identified the depth and richness of qualitative research into social processes and the complexity of social life, Glaser identified the systematic analysis inherent in quantitative research through line by line examination, codes, categories and properties. Constructivist thinking became very influential. Kathy Charmaz began to think about grounded theory using this methodological lens.
3	The Diffusion Decade 1980 - 1990	Dubbed the era of the “crisis of representation”. Charmaz began to publish work. Influenced by the 3 rd and 4 th moments in its focus on the place of the author in the text, the author’s relationship with participants

	Decade	Developments
		and the importance of writing in constructing a final text that remains grounded in the data. Strauss responded with Juliet Corbin (Strauss and Corbin 1990) providing guidance by prescribing coding procedures and comparative techniques which offered a variety of ways to manipulate data. This approach has been criticised as over rigorous to such a degree that theoretical sensitivity may be reduced (Kools et al 1996).
4	The Diversification Decade 1990 - 1996	This extends and overlaps the previous moment and is termed the triple crisis as it adds legitimation and praxis to representation. Legitimation questioned particular measures used for deciding the merit of qualitative research outcomes, while praxis provoked questions about the ability of textual analyses of society to effect change. Postmodernist thought permeated much of this debate.
5	2 nd Generation Grounded Theory Contemporary and future	Adele Clarke's work on situational analysis incorporating Strauss's work on social worlds and arenas and the notion of situations, embracing the ideas of postmodernism. Kathy Charmaz developed constructivist grounded theory. Juliet Corbin finalised 3 rd edition of Corbin & Strauss 2008. Computers were used for analysis.
Adapted from Morse (2009), Aldiabat & Le Navenec (2011) and Birks and Mills (2011)		

Strauss emphasised meaning, action and processes congruent with symbolic interactionism. He favoured verifying emerging concepts with participants, thus co-constructing meaning with them (Charmaz 2008, Scholes 2010). In contrast, Glaser felt grounded theory had an objective emphasis employing analytic procedures and comparative methods. This allows the development of concepts and assumptions which are derived from an external but discernible world (Charmaz 2008). However, both authors concurred that constant comparative analysis, theoretical sampling and theoretical memoing were essential in the process of developing theory (Rennie 1998, Walker and Myrick 2006).

Schatzman addressed the complexity around analytic procedures by embedding it in symbolic interactionism driven by the notion that humans act towards things based on what they mean to them (Kools et al 1996). He did this by making use of an individual's own ability to 'conjure up' dimensions, or in other words using the natural human analysis we all possess as we engage with a situation. Kools et al (1996) describe this as the ability 'to perform and develop the cognitive attribute of dimensionality' (page 315). An individual naturally identifies the different parts of a perceived phenomenon such as its attributes, the context in which it sits, the processes in play as well as what it means to the participants and researcher (Schatzman 1991).

Natural analysis involves considering actions taken in relation to the context, conditions and consequences, asking questions of each (Robrecht 1995). This natural analysis takes into account a person's experience and existing knowledge, acknowledging these as part of the thinking process or 'dimensionality' because the main issues of the story represent a point of view, or in dimensional analysis 'speak', a perspective (Kools et al 1996, Bowers and Schatzman 2009). Dimensional analysis is a dynamic process but does not reject the use of received theory as originally purported in grounded theory (Glaser and Strauss 1967).

Schatzman believed that building on comparative analysis developing dimensions (characteristics), plus assigning a value to them in terms of relevance, and then making inferences by assuming relationships among the dimensions would lead to a richer understanding of the phenomenon. Employing an extensive range of dimensions would prevent the threat of early theoretical closure (Bowers and Schatzman 2009). In particular, the explanatory matrix enables the researcher to check for plausibility of ideas, and also consistency of them in relation to the context, conditions and consequences of the study (Schatzman 1991). There is, therefore, an assurance of credibility.

3.4 Dimensional Analysis

Dimensional analysis is a methodological approach to the grounding of theory in qualitative research (Schatzman 1991). It enables generation of theory directly from data offering a comprehensive and thorough examination of data and a rich view of the phenomenon whilst accommodating shifting perspectives (Bowers and Schatzman 2009). Acute care nursing is a field I am familiar with, and considering the multiple facets of this field of nursing, as well as the requirement to acknowledge then set aside my own perspectives, this method of analysis offered a robust way of enabling me to see '*all that is involved*' from a variety of perspectives, some that I had not previously considered.

Schatzman proposed dimensional analysis as an alternative way of generating grounded theory. He believed previous methods of analysis often appeared indistinct to the reader and in particular to a person who may wish to learn from the research, and perhaps adopt it (Schatzman 1991, Gilgun 1993, Bowers and Schatzman 2009). Dimensional analysis delineates the 'discovery process' in qualitative research enhancing its visibility (Kools et al 1996). Dimensional analysis comprises four main phases which are explained in section 4.5 in greater detail. The key elements are:

- i. Dimensionalising – naming data bits (abstract concepts and lining these up against properties for comparison across cases)
- ii. Differentiation – conflating and expanding dimensions determining the significance of data bits and their relationship to one another
- iii. Explanatory Matrix – ordering the data into context, conditions, processes and consequences before organising the dimensions and properties illuminating the central perspective
- iv. Integration/reintegration – developing the explanation of the dimensions around the central perspective to build theory
- v. Writing the theory (Scholes 2010).

Dimensional analysis is informed by the central ideas and practices of grounded theory, but differs in that it has its own logic, epistemological assumptions, and specific procedures that differ from the grounded theory described by Glaser and Strauss. It extends and elaborates on the original constant comparative method (Schatzman 1991, McCarthy 2003). The analytic processes are shown in Table 3.2. Schatzman believed these structures enabled his students to proceed with their analysis more thoroughly than by merely utilising the single tool of comparative analysis. He believed strongly in the demystifying of analysis and making explicit the interpreting, discovering and constructing processes.

Table 3.2 Analytical Processes Used in Dimensional Analysis

Procedure	Process
Developing, calling up dimensions (characteristics).	In qualitative research this process happens readily, but without the other analytical procedures the identified dimensions may be seen as the only possible ones.
Assigning relative value to each of the identified dimensions.	This analytic process involves the researcher weighing relevance salience of the dimensions or rejecting them as not inherent to the situation being studied. This process is influenced by the researcher's own personal and professional experiences and knowledge. Values are then assigned to the identified dimensions.
Inferring, making inferences about dimensions conjured.	This analytic process involves the researcher making comparisons among the dimensions, but also assuming relationship among them as well as relevance or irrelevance of those dimensions.
Focusing on 'what all is involved' in the data.	Schatzman felt that researchers fell into the trap of focusing too early on a basic social process, without conjuring a large bank of dimensions. He was concerned premature closure might then occur and urged his students to stay open to 'what all is involved' thereby permitting a richer view of the phenomenon.
Bowers and Schatzman 2009	

The research question demanded an approach that could detect and unfurl the dynamic intricacies of the clinical situation. Having established the multi-factorial nature of the nurses' decision-making, I took a position of co-constructing meaning with them. I believe that natural analysis played an intrinsic role in capturing the complexities of the observed relationships. I consider that dimensional analysis offered a structure that illuminated these complexities and presented both researcher and reader with a script to disclose the links between actions and consequences.

3.5 Theoretical Saturation and Sufficiency

Theoretical saturation is the point where the researcher no longer considers there is a useful benefit in continuing to collect data. Glaser and Strauss (1967) describe this as when additional collected data no longer develops the properties of a category. Reaching theoretical saturation is central to grounded theory as it represents the point where the researcher believes nothing new will emerge. Glaser (1978, 2010) warns of premature closure which can result in at best a detailed description or account rather than the development of a substantive or formal theory. However, it can be considered as a '*matter of degree*' (Strauss and Corbin 1998). Strauss and Corbin (1998) suggest that there is always potential for new dimensions to emerge if the researcher searches hard enough. The notion of saturation and whether saturation is at all achievable has been challenged and the term 'theoretical sufficiency' has been used instead to indicate the adequacy of data and fullness of analysis and dimension development (Dey 2007). The challenge is that partial rather than exhaustive dimensionalising takes place and dimensions are not identified for all data. Charmaz (2006) argues that categories are 'suggested' by the data rather than saturated. Moreover she suggests that saturation may be an artefact of the way researchers focus and manage data collection thereby posing questions about the legitimacy of claims (Charmaz 2006). Within this study data collection ceased when no new dimensions were being developed. I then moved to verification to check

the validity of my findings through re-interviewing and establishing a focus group. This is further explained in section 4.5.9, Chapter 4.

The nature of grounded theory renders a defined sample size impossible. The study size is settled when no new data is gathered and saturation is reached. The study was situated in one NHS hospital. It could be argued that undertaking fieldwork in different settings might have elicited new data. However there were logistical constraints presented by the professional doctorate timeline and NHS guidelines. Also, the aim of this study was to explore the phenomenon of decision-making with acutely unwell patients at a particular point in time. Healthcare is prone to rapid and unexpected change which could have adversely impacted the contemporary relevance of this study, the need for which was evident from the background literature review (chapter 1). Given these factors, instead of making claims of achieving saturation, I preferred to use Dey's term 'theoretical sufficiency' as a better fit of how I conducted this grounded theory (Dey 2007).

3.6 Critique and Limitations of Grounded Theory and Symbolic Interactionism

The background literature (chapter 1) demonstrates that most authors in the critical care arena have adopted a positivist stance to explore the issues. The critical care world is steeped in quantitative studies where comparisons of mortality rates, readmission to ICU rates and much more are reported. A criticism levied at exploring the phenomena from a qualitative perspective relates to the perception that this type of approach is not effective in producing valid data and results which will ultimately benefit the patients. This view is founded on my personal communications over many years.

Research techniques in the quantitative paradigm cannot embrace inductive processes. Grounded theory continues to struggle to achieve the same status as other studies utilising highly controlled clinical trials (Birks and Mills 2011). As argued in chapter 1, the plethora of studies thus far has not achieved a

substantial improvement in the care of acutely unwell deteriorating patients it seems timely to contemplate a new approach. I believe that grounded theory using dimensional analysis will uncover what is at the 'nub' of the problem because it offers a way of being able to illuminate '*all that is involved*' from the perspective of those undertaking the work. This is a methodology that lends itself to revealing the tacit knowledge, thoughts and motives of the nurses and how their interactions influence their clinical reasoning, albeit unknowingly through hearing their stories. Moreover Schatzman developed dimensional analysis as a way of revealing the hidden internal barriers encountered by researchers and this enhances the credibility and trustworthiness of the study (Schatzman 1991).

The subjective slant of grounded theory may pose limitations. The study will only illuminate the world of acute care as perceived by those taking part in the research. There may be many other valuable data that will not be gathered into this study. However, the research is designed to gain insight into how this particular group of staff care for and manage patients. The study is not designed to be generalizable across many settings, but will offer new researchers a platform on which to anchor their investigations. The implicit subjectivity will be managed reflexively and demonstrated via transparent audit trails. However although grounded theory can be misconstrued as purely subjective, it is important to note that it can incorporate quantitative and qualitative data (Glaser and Strauss 1967, Andrews 2012).

My rationale for locating the study within the symbolic interactionism perspective was that it would provide a lever with which to reveal all that is known about the nurses' behaviour. However, this can never be the case, despite dimensional analysis purporting to be the vehicle through which to illuminate '*all that is in there*', this will never be fully possible (Benzies and Allen 2001). Critics have suggested that the psychological, emotional and unconscious elements in human behaviour are under emphasised (Benzies and Allen 2001). These limitations are recognised and acknowledged, and the study design will facilitate maximum illumination of the phenomena through rigorous technique and procedural precision. Symbolic interactionism

provides a mechanism through which to situate and deconstruct the social processes in play and dimensional analysis provides a dynamic yet revelatory framework.

It is accepted that grounded theory and symbolic interactionism may not alone fully develop the body of nursing knowledge required for a study of this nature (Benzies and Allen 2001). However the constant comparative techniques and use of differing analytic lenses allows the development of concepts that can be pursued simultaneously. The study, whilst rooted in social science, can legitimately include other disciplines if the data demands it. Adopting a methodology rooted in symbolic interactionism using grounded theory and dimensional analysis is not detrimental to this study but advances its scope.

3.7 Timing of Literature Review

The point at which the literature review should appear in a study and the extent it should permeate through the study is a contentious aspect of the grounded theory research process (Birks and Mills 2011). Glaser, Strauss and Schatzman hold different views on the benefits of an early review of the literature. Glaser in both his early seminal works (1978) and more recently (2011, 2012) advocates entering the field having not consulted the literature. He sees advance literature review as a waste of time, causing preconceptions prior to entering the field thus reducing theoretical sensitivity and potentially forcing a theory that may not actually exist (Glaser 2012). He advocates only looking at the literature after the emergence of the developing theory when core categories have been established. The belief is that avoiding a literature review at the beginning of the study means that the emerging theory is more likely to be grounded in the data (Glaser 2010, Andrews 2012).

However, it is acknowledged that no researcher enters the field in a blank state (Birks and Mills 2011). Strauss and Corbin (1990) supported an early review to establish the study's purpose and significance. They also advocate simultaneous review of the literature as the study progresses as a beneficial

counterbalance to emerging data and conceptualisations. Schatzman used the literature to provide an abstracted framework to highlight what is new or recognise what is significant in the dimensions as analysis patterns and comparisons are sought (Kools et al 1996, Scholes 2011). He stated that the researcher can argue with the literature and compare it with their own analysis yet still avoid being overly influenced by the prevailing theory (Gilgun 1993).

Birks and Mills (2011) argue that there are many ways a limited and purposive preliminary review can assist the research and enhance theoretical sensitivity. Andrews (2004, 2012) suggests the researcher undertakes such a review of the background literature as part of this process but he advocates Glaser's view regarding the timing of an in-depth review. Research Ethics Committees often require background literature to be provided as part of the proposal prior to ethical approval. The purpose of the literature review is to furnish the researcher with an understanding of the extent of current knowledge on the study topic. This orientates the researcher without necessarily prejudicing them in favour of existing theoretical concepts. The review also alerts the researcher to potential knowledge gaps. Another advantage is the exposition of alternative research methods. Literature review can also allow the researcher to experiment with different theoretical frameworks in which to situate their study.

As a researcher with a long term prior interest in the topic being investigated, I was familiar with the seminal works and policy documents surrounding the suboptimal care of ward patients (Schein et al 1990, Hillman et al 1996, Goldhill and Sumner 1998, McQuillan et al 1998, Audit Commission 1999, McGloin et al 1999, DH 2000, NCEPOD 2005, NICE 2007, NPSA 2007). These works had already indicated to me the gaps in evidence that then could form the basis of my study. I used the literature to collate a summary of key themes which, in effect, sensitised me theoretically to the pertinent issues in acute care with declining patients. The clinical reasoning and decision-making literature new to me were reviewed in depth following data collection and integrated into the constant comparison process during analysis to develop the substantive theory. This review elucidated the methodological

and topic gaps in contemporary knowledge emphasising my study's relevance. The comparisons made between data and literature made a valuable contribution to the generation of the substantive theory.

3.8 Managing the Reflexive Self

Schatzman (1991) allows the perspective of the researcher to be acknowledged and integral to the research without detracting from the validity of the results. Moreover, the researcher's perspective shifts through the inductive deductive cycles leading to new insights (Gilgun 1993, Scholes 2012). Schatzman spoke of researchers using '*what they wish to bring in*' as a perspective through which they may analyse their data (Gilgun 1993). This may constitute their own methodological biases and perspectives gained through skill development and experience (Schatzman and Strauss 1973). Recognition and acknowledgement of my own position within the research was crucial. My perspectives could impinge on the research and this required constant self-monitoring.

Despite my many years of nursing in the NHS, I have not worked as an acute care nurse since 1982. Since then I have been based in intensive care with 6 years as a critical care outreach nurse. I had therefore always reviewed unwell ward patients through the eyes of a critical care expert, rather than as a ward nurse lacking critical care experience. Could I therefore engage in the study of ward nurses' decision-making and clinical reasoning having only worked alongside them as a specialist resource?

I have, however, worked in the wards, with multidisciplinary teams involved in direct patient care, for many years and witnessed both good and bad practice. I feel that gives me some insight into the issues and difficulties ward nurses face. I know what I thought I knew of how other people made their decisions but had never sat beside them and heard their accounts. Supporting them as a senior clinical nurse inspired and motivated me. Schatzman's dimensional analysis allowed my perspectives to act as a lens through which to challenge

the data and ask questions of the data whilst actively seeking to refute and challenge my own personal assumptions as they surfaced. I identified some advantages of my prior critical care knowledge and experience. For example, I was well positioned to be attuned to the real-life meanings behind the nurses' interactions, and also to establish ways to communicate with them so that others may understand (McCallin 2002). Lincoln and Guba (1985) and Morse (1991) suggest that familiarity with aspects of the culture such as understanding the history and context, vocabulary, including jargon and abbreviations are advantages. This '*a priori*' knowledge that may enhance the capacity to elicit in-depth data suits the epistemological stance I have adopted (Borbasi et al 2005, Koch 2006). As an experienced critical care nurse my clinical observation and interpretation skills are finely honed and continually practised. This stood me in good stead for noticing the unusual whilst data collecting and analysing.

It was important to me to mitigate, account for, or otherwise take advantage of the effects of my presence (Schatzman and Strauss 1973). My aim was to have a sense of my self-consciousness and be able to put it to analytical use (Cutcliffe 2003). How I integrate, shape, influence, respond in the field, and thus how I might impact the study needs accounting for and made transparent to assure trustworthiness (Scholes 2012). I used different types of memoing that guided me to move in and out of the data, comparing and contrasting the dimensions, testing out abductively derived hypotheses via the explanatory matrices. Whilst performing these functions it was possible to use 'self' as a sensitising agent with which to draw out theoretical possibilities within the data and increasingly derive abstraction. The recording of memos, maintaining a reflective diary and noting theoretical insights through constant comparative analysis resulted in an audit trail of my methodological decisions. These reflexive activities enhance the credibility and authenticity of the findings providing transparency to the methods employed (Cutcliffe 2003).

3.9 Strategies for Theory Verification

Shatzman said “*Students do a superior piece of work when it is relevant to theoretical constructions in their field*” (Gilgun 1993). With theory verification researchers are looking for a ‘*fit*’ of their claims: the theory should resonate with readers and be understandable (Glaser 2010b, Andrews 2012). It should have workability and be useful to readers within the field of its intended use thereby demonstrating relevance (Birks and Mills 2011). It should have modifiability and be able to account for the resolving of an issue and be able to be tailored for a specific purpose in practice as well as being able to accommodate later variation to ensure its continued relevance (Birks and Mills 2011, Andrews 2012). The validity or trustworthiness should be present in the study findings (Scholes 2012). Trustworthiness (validity) of a study relates to whether the findings of the study are worth taking account of, whether the reader has confidence in them and whether they are credible (Lincoln and Guba 1985). It comprises four areas:

- Credibility or verification that the findings are believable to the reader and represent reality
- Transferability of the findings to other situations
- Dependability of the study procedures and that there is a clear decision trail
- Confirmability that the findings relate to the data.

How this study demonstrated its commitment to trustworthiness will be shown in the following section.

3.9.1 Credibility

The purpose of the study was to engage with the clinical reasoning and decision-making processes nurses undertook when caring for a deteriorating patient. This was achieved through semi-structured interviews, a focus group and observation. Therefore the only people with authority to comment

legitimately on whether the researcher's interpretation of their world was true and authentic would be the participants. The abductive nature of dimensional analysis with its 'to-ing and fro-ing' in and out of the data, making connections across dimensions and returning to the field to verify emerging patterns with the participants enhances the study's credibility. Participants who are able to recognise themselves in the analysis and findings can confirm the credibility of the research (Guba and Lincoln 1989). The emerging concepts and patterning of the dimensions was discussed with participants via a focus group. Interviews were also conducted for verification purposes.

Researcher expertise is considered a criterion influencing quality in the conduct of grounded theory research (Birks and Mills 2011). Although there are no definitive criteria that can determine the credibility of the researcher, there is a stated need to be transparent about personal and professional information with the potential to affect the data analysis (Patton 1990). By reflexively charting my methodological decisions and how I influenced the study I was able to demonstrate a reflexive management of the data. How I underwent this is discussed in detail in chapter 4.

Methodological congruence and procedural precision are key criteria for assuring credibility of a study (Birks and Mills 2011). This chapter has explained the synergy of the approach taken and why it fits the research question. The methods employed are discussed in chapter 4 which will catalogue the procedural precision and study management.

3.9.2 Transferability

Transferability refers to the degree to which the research findings can be generalised or transferred to another setting and that reveals a pattern that is recognisable and useful. This study examines the decision-making processes of nurses in medical and surgical wards in one discrete hospital. Its findings, through semi-structured interview, fieldwork and a focus group may only reflect this population and therefore cannot be generalised to others. Others may attempt to transfer the findings and theory, and hence it is important to

provide an illuminating in-depth story of the case to assist future practitioners (Geertz 1973). This is demonstrated in chapter 5.

3.9.3 Dependability

Dependability is concerned with the transparency and tracking of the research process and changes throughout. The data collection period for the study took place over 18 months. There were very few changes in the Trust during this time, although some participants moved on. An audit trail that contains detailed descriptions of research methods and methodological decisions demonstrates dependability and categorises how the study was managed. In addition, an audit trail of the procedures and processes was recorded and maintained. This includes interview guides, notes, documents, memos and journals (Appendices 9, 10, 11 and 12).

3.9.4 Confirmability

Confirmability refers to the degree to which the findings can be substantiated and confirmed by others. This relates to the '*fit*' that Schatzman and Glaser discuss (Gilgun 1993, Glaser 2012). We know that researchers bring and use their own perspectives to the research process, and moreover those perspectives shift as the research progresses. Verification of the emerging theory is a vital component of the abductive reasoning that consolidates the development of the theory. The strategy for verification was to return to the field and share the emergent concepts with participants. In addition, resonance with the findings was sought through action learning sets, meeting with fellow researchers who acted as 'critical friends' and presenting emerging findings at conferences. These steps assure confirmability.

In summary the theory verification of the study was enhanced by:

- Methodological congruence
- Procedural precision

- Prolonged time spent in the ward areas
- Abduction through generating memos, realigning dimensions and using the constant comparative method
- Using conceptual levers to increase abstraction and conceptualisation (discussed in Chapter 4)
- Theoretical sufficiency
- Verification with participants
- Peer review from colleagues in the action learning sets
- Research supervision
- Reflective/reflexive diary
- A clear and transparent audit trail.

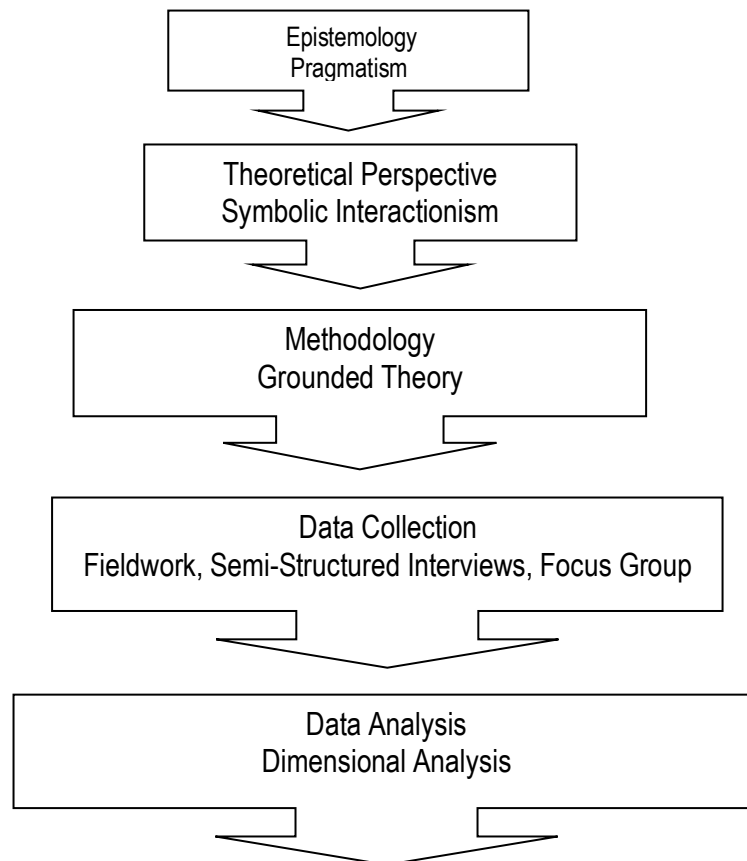
3.10 Summary

The essence of this research was to make sense of the interactions in the real world of acute care nursing. The driving impetus was to understand the decision-making processes used by nurses caring for deteriorating patients and develop an overarching explanative theory. This chapter has explained why grounded theory was selected as the underpinning methodology to explore and explain the social processes at play in this world. It has explained how dimensional analysis will permit and enhance deep insight. It has discussed the abductive nature of data collection and analysis and the critically reflexive relationship between the researcher and the data. The history and theoretical origins of dimensional analysis and grounded theory methodology are established while published criticisms and potential limitations are acknowledged.

The methodology chosen philosophically underpinned this world where theory is extracted from real time practice, where there is no such thing as a single truth or an objective reality and where life timelessly shifts in a dynamic tide. It is a socially constructed, fallible world. I believe my chosen approach will generate a rich story and illuminate the miasma of decision-making within

clinical reasoning in this setting. Figure 3.2 depicts the methodology for this study.

Figure 3.2 Developing the Methodology



(Adapted from Crotty 1998, p. 4)

These can be summarised in the following way:

- View of social world/ontology/nature of social world: *Interpretivist*
- Research paradigm/epistemology: *Pragmatism*
- Methodology: *Grounded theory*
- Data collection: *Fieldwork, individual semi-structured interviews and a focus group*
- Data analysis: *Dimensional analysis.*

The next chapter provides details of how these methodological decisions were used to shape the methods of data collection and data analysis. It offers an audit trail of the procedures and processes used throughout data collection and the processes used for data analysis to enable judgments to be made around dependability and confirmability of the study. It aims to make explicit to the reader the process by which the substantive theory was created from the research data.

Chapter 4 - Methods

4.1 Introduction

This chapter describes the selection of the study sample and explains the procedures and techniques used for gathering and analysing the data. Grounded theory research involves simultaneous data collection and data analysis: the constant comparative method. Dimensional analysis allows the researcher to inductively build an idea then deductively check it out in a series of cycles. Through writing theoretical memos and moving in and out of the data, decisions about data collection, sampling and the conjuring of emerging dimensions and their properties guided the process (Schatzman 1991, Scholes 2011).

The study was undertaken in three distinct phases of data collection:

Phase 1 comprised fieldwork and interview of seven participants on a surgical ward, its purpose to collect initial data.

Phase 2 comprised further fieldwork sessions and interviews of participants on a medical ward having begun using dimensional analysis for data analysis that then informed further data collection decisions.

Phase 3 was the verification stage and comprised three further interviews with a further 3 participants, and a focus group. The emerging theoretical insights determined what additional data to collect and from whom (Schatzman 1991).

The chosen methods of sample selection and data collection are expounded followed by a discussion of the benefits and limitations of the methods adopted. The process of theoretical sampling and developing dimensions with explanatory matrices are described and discussed. The emergence of a central organising perspective is explained. The chapter aims to make explicit how the substantive theory of '*mind accounting in clinical reasoning*' was developed from the research data.

4.2 Ethical Conduct of the Research

Ethical approval for this research was obtained from East Kent Local Research Ethics Committee (Appendix 4), the University of Brighton's Faculty of Health and Social Science Research Ethics & Governance Committee, and from the Research and Development Departments (R&D) at the hospital I worked in as well as the research site. Approval was given with one stipulation that observations were not to be used as data. How I worked with this stipulation is discussed in section 4.5.3.

4.2.1 Gaining Access

The research took place within a district general hospital. Gaining access to the Trust required permission to be sought from a number of 'gatekeepers'. Approaches were made to the stakeholders within the Trust at the most senior level prior to any approach being made to potential participants, and certainly prior to any data collection. As well as formal contact with the Trust's R&D Department, permission was sought from the Director of Nursing and Medical Director via a letter containing an outline of the proposed study. Contact was made with the Senior Nurse for Practice Development in order to explain the nature and purpose of the research. This person was my line manager during my time in the Trust collecting data and an honorary contract to practise was set up. This was necessary in order for the Trust to be sure that I would adhere to their confidentiality and health and safety policies and procedures. I was issued with a car parking permit and identity name badge that assigned me my role as 'Student Researcher, University of Brighton'. At this point other stakeholders were identified and contacted including the matrons and sisters or charge nurses of the acute care wards.

4.2.2 Addressing Ethical Concerns in the Study

Ethical considerations raised by this research were around informed consent, protection of privacy, anonymity, confidentiality and harm or benefit to

participants. Professional accountability issues regarding potential intervention versus non-intervention whilst undertaking fieldwork required assessment (Germain 2001). These are now discussed in turn.

4.2.3 Informed Consent

One of the most fundamental ways we demonstrate respect for others is by gaining their consent to actions that will impact on them (Farsides 2003). There is a moral and legal duty upon healthcare professionals in clinical research to acquire the consent of all participants (Nursing and Midwifery Council (NMC) 2008, DH 2005, Royal College of Nursing (2007).

The strategy for seeking informed consent for this study comprised several different avenues of approach to maximise the opportunity for potential participants to be informed about the study and allow them enough time to consider whether to take part. Participant Information Sheets (PIS) that followed the Integrated Research System's (IRAS) guidance were designed (Appendices 3 and 4). There were leaflets about being shadowed and interviewed as an individual and a leaflet for potential focus group participants (Appendix 7). In addition posters for display were distributed in the wards (Appendix 8). This was particularly important as during fieldwork it was anticipated that there would be a constant flow of other people moving in and out of the research field. This ensured everyone was aware of the study taking place.

The use of semi-structured interviews allows the researcher and participant opportunity to discuss other topics that arise whilst using a prepared guide of interview questions. However this prevents participants being completely forewarned of the interview content. I relied on the participants understanding the nature of the interview and trusting my conduct of it. The quality of the data obtained may have been influenced by the degree of trust implicit in the consent process and my prior presence on the ward during discussions regarding the study. The foundations of mutual trust, honesty and value

encourage a greater openness during the interview process (Schatzman and Strauss 1973).

I was privileged to have the assistance and support of the Trust Senior Nurse for Practice Development who distributed information and facilitated logistics. I visited the wards who had agreed in principle to take part and met with staff in person to explain the study. All potential participants were given a minimum of 24 hours to consider whether to take part. The majority had longer. In addition, refresh consent was sought at every fieldwork session, in addition to having received the participants' written consent (Moore and Savage 2002). I also checked with the nurse in charge on the day, to ensure it was still acceptable to attend. At the start of the fieldwork periods and whenever new people arrived on the ward, I checked staff were happy for me to continue.

Patients inevitably fell into the areas where I was working. I explained to the patients that it was the nurse I was shadowing. The IRAS form addressed seeking informed consent from patients and the Research Ethics Committee agreed that, should their input be thought contributory, retrospective consent would be sought if the patient was competent to give it, and before any data was recorded in writing. However, the study focused on clinical activities, and patient involvement was represented within the context of clinical care (Philpin 2004). In fact no patients were recruited into the study, but the risk around informed consent was considered.

4.2.4 Avoiding Power Relations and Coercion

My fulltime job was that of a Consultant Nurse in Critical Care Outreach. I felt this may cause potential power relations and coercion issues in the field. I therefore chose to undertake the study in a Trust where I was not known and I assumed the role of student researcher in order to mitigate the risk of coercion. The ethical considerations were 'policed' via the use of a reflexive approach at all times as the research progressed.

4.2.5 The Protection of Privacy, Anonymity and Confidentiality

Research data is highly sensitive, and healthcare professionals have always acknowledged an explicit duty of confidentiality to their participants (Farsides 2003, NMC 2008). This study involved me working with people who might reveal personal achievements and failures either during fieldwork or during the interviews. To address this I replaced the participant's name with 'Participant 1, 2 etc.' Particular attention was paid to the danger of disclosing participants' identity if they were the only person in the ward with that particular rank, role or profession.

Participants can reveal sensitive information about colleagues or their own clinical practice that they may later regret. The Participant Information Sheet stated the possible disadvantages of taking part in the study, and informed participants what support was available to them and how to access it. I secured funding for ten 1-hour sessions with a psychologist and counsellor who agreed to receive participant referrals if required. Fortunately no participant felt the need to use the service, and moreover some expressed how cathartic they found discussing their practice. It was essential that my fieldwork skills were empathetic in order to develop a rapport with the participant and minimise their participative risk. The impact I, as the researcher, had on the researched was evaluated through reflexive techniques (section 3.8 in chapter 3) and verification at the focus group and the last 3 interviews used for verification (Moore and Savage 2002).

4.2.6 Professional Accountability

My role as a ward based researcher necessitated that I adhere to professional standards and the Code: Standards of Conduct, Performance and Ethics for Nurses and Midwives (NMC 2008). An ethical agreement was set up with the ward managers prior to data collection (Table 4.1). It outlined when I would intervene in accordance with the NMC Code (2008). Although the issue did not arise, should I have witnessed poor practice, I would have taken the appropriate action and ensured any incident was reported according to local

procedures (NMC 2008). This was made clear to participants when seeking consent.

Table 4.1 Ethical Agreement with Ward Managers

The Researcher will intervene in patient care in the event that:

- A patient is experiencing a life-threatening event, for example cardiac or respiratory arrest, or a deterioration that staff are not responding to
- Patients' lives are at risk from other patients or a fire
- No healthcare professional is present and the patient is in danger or at risk of sustaining an injury, for example a fall
- Poor practice may harm a patient or staff member.

Adapted from Casey 2004

All participants were given the opportunity to ask questions about the research, and were aware that they could withdraw from this study at any time without negative consequences.

4.3 Recruitment of Study Participants

The number of participants included in the study was 24, comprising a mix of registered nurses, healthcare assistants and physiotherapists of different ranks, specialities and seniority (Table 4.2 – Participant Characteristics). Participants were invited for their potential to illuminate the clinical reasoning social process across a range of the nursing workforce. This included non-registered staff who cared for deteriorating patients because of their important contribution in the decision-making process working as part of the team with the registered nurses. I purposively and theoretically sampled according to evolving insights. For example, I theoretically sampled 2 physiotherapists when exploring a particular concept around possible delays in referring a patient. Their insights as receivers of referrals enabled me to build on my conceptualising as I carried out data analysis and compared and contrasted across developing dimensions. Initial sampling was focused on generating as many dimensions as possible through a wide range of data (Strauss & Corbin

1990). The sampling choices comprised convenience sampling, purposive sampling, snowball sampling and theoretical sampling. My aim was to maximise the range of specific information that can be obtained from participants, seeking those who can 'tell it as it is' (Erlandson et al 1993, Germain 2001).

Table 4.2 Participant Characteristics

Participant	Post	Years Nursing	Months/Years in Post	Qualified	Courses	Experience
Surgical Ward - General						
1	Band 6	15 HCA previously	2 months	2003		
2	HCA	35	35 years			
3	Band 5	5	5 months	2004	45 day in-house HDU course	
4	Band 5	29	4 years	1980		
⁵ 5	Band 5	5	4 years	2004	BSc HDU course	
6	Band 6	20 HCA previously	5 months	2002		ITU & A&E experience
7	Band 5	10 months	2 months	10 months		
Medical Ward - Respiratory						
8	Band 6	18 months	6 months	1988	Cardiology	All on this ward
9	HCA	30 years	1 year			
10	Band 5	3½	18 months	2006 (3½ years)	HDU Respiratory	CCU experience
11	Senior Physio			Not collected		Mainly respiratory
12	Physio			2008		
13	Band 5	3 years as a HCA in a previous post	10 months	2008		

⁴ The 5-Day High Dependency In-House course was developed for non-critical care nurses working in acute care environments. It is run by the critical care outreach team and gives the basic theory on the recognition and response to patients who the nurses are worried about.

⁵ This participant was observed and interviewed in phase 1 and agreed to be re-interviewed for verification purposes at phase 3.

Participant	Post	Years Nursing	Months/Years in Post	Qualified	Courses	Experience
Medical Ward - Gastroenterology						
14	Band 6	4	2 months	4 years	ALERT™ Course ⁶	
Medical Ward - Respiratory						
15	Band 7	12 years	2.5 years	1999	ALERT HDU Respiratory course	
Focus Group Participants						
16	Band 5	5 months	5 months	July 2010		Medical Ward
17	Band 5	1 year 3 month	Not collected	1 year 3 months		Surgery
18	Band 5	5 months	Not collected	July 2010		Clinical Decision Unit
19	Band 5	3 months	Not collected	3 months		Medical & Chemotherapy
20	Band 5	2 months	Not collected	2 months		A&E/medicine
21	Band 5	5 months	Not collected	July 2010		Theatres Recovery
22	Band 5	5 months	Not collected	July 2010		Surgery
23	Band 5	5 months	Not collected	July 2010		Respiratory
24	Band 5	5 months	Not collected	July 2010		Respiratory

The sample size was difficult to predict for this study, but ethical approval allowed for up to 20 participants plus 2 focus groups. Because of its iterative process, participants and numbers of participants were selected according to the requirements of the data analysis and emerging themes. As a rule of thumb, it is safe to stop data collection when no further new broad patterns emerge and where participants' perspectives in interview are confirmatory rather than contradictory. This occurred after 13 participants were recruited. The remaining participants formed the focus group and last 3 interviews⁷ that were undertaken for verification purposes.

⁶ The ALERT™ Course is a one day programme with a practical element on the recognition and response to ward patients who become unwell. Founded in Portsmouth Hospital by the critical care team it is widely taught in acute hospitals. ALERT™ = Acute Life-threatening Events Recognition & Treatment

⁷ One participants was interviewed a second time for verification purposes (Participant 5)

4.3.1 Recruitment Strategies

The prior circulation of study information meant that most potential participants were aware the study and already expressed an interest in taking part. Three people who were approached declined because they did not want to be shadowed. After talking with a potential participant I left them a leaflet and consent form. I either arranged a tentative time to shadow and interview them, or if they preferred gave them the option to return the signed consent form to me in the stamped self-addressed envelope also given to them (Appendices 7 and 8 - Consent Forms). This delay minimised the risk of coercion. Once either a signed written consent form was received (no time limit was set), participants were contacted to arrange an interview and fieldwork session. Those who had agreed a date were telephoned on duty the day before, or the day of the shift to check they were still able to take part. There were four occasions when participants declined as they could not be released for interview due to their ward commitments. Three of these participants established another time, 2 via telephone and 1 on another date.

The focus group participants were approached together as they were a cohort of registered nurses on a study/development day. This group offered an opportunity to explore my emerging theory from the perspective of junior nurses who had experience in caring for deteriorating patients. Participants with this level of experience had not yet been sought in the study. They had received the information in advance and agreed to take part for 1 hour as part of their study day. Consent forms were obtained at the start of the focus group. All participants agreed to be digitally recorded during the interview and focus group.

4.3.2 Theoretical Sampling

In keeping with the interpretative paradigm, sampling was not wholly pre-specified and was governed by emerging data insights (Spradley 1980, Sarantakos 1998). The aim was to actively seek what was relevant to the study, and to theoretically seek the typical and divergent according to

emerging insights. As dimensions began to emerge from the data the direction of sampling became apparent. This meant sampling the routine as well as the extraordinary, a key aspect of dimensional analysis when at the differentiation stage (Kools et al 1996). From within the field, decisions were made about what to note and when, who to talk to and what to ask. For example, the same event may be quite different if sampled at a different time of day in the same ward area. These decisions were initially quite broad, but became more selective as the study progressed. Initially, convenience sampling was used simply following nurses who had volunteered to participate. As dimensional analysis commenced, participants were theoretically sampled to create greater clarity around the emerging dimensions.

Particular participants were sought for their capacity to fill gaps in the data that emerged during the analysis (Glaser and Strauss 1967, Miles and Huberman 1994, Sarantakos 1998, Darlington and Scott 2002). For example when I was considering whether the dimension 'staff characteristics' had salience I sampled a selection of nurses of varying bands and experience. Participant 1, a Band 6 Junior Ward Sister, when asked about the PAR score in routine decision-making, said:

“With the junior members of staff it is 100% useful.... There are a lot of trained nurses coming through the system now, and I find them very robotic..... They don't look further than the end of their nose, they basically come here, they just do the drugs, do the washes, give the drugs, do the dressings”.

I then made an analytical memo to cross check this theoretical point with other Band 6 Junior Sisters and to sample junior nurses to compare their use of protocols. I also wanted to view across dimensions and these data could purposively guide a sampling decision.

Snowball sampling occurred when participants were asked to identify others who may add to the data from their own perspective (Gray 2004). These people were then approached to take part in the study. Theoretical sampling

was used as part of the cyclical process of data collection, analysis and further data collection. It was also used to determine the final interviews and focus group for verification purposes. It was also employed to test potential central organising dimensions. For example, through differentiation I designated the dimension '*locus of control*' as the central organising perspective. I presented to the focus group a theoretical explanation that I felt had emerged from the data and then asked them to consider situations where this had happened to them in their practice. This elucidated further insights, but revealed to me that the theory was merely one aspect of the central organising perspective rather than the perspective with greatest explanatory power. Theoretical sampling provided the opportunity to explore a dimension and examine it in depth with the participants in varying contexts. The constant comparative method using interview data, literature and memos framed my sampling decisions. This, together with theoretical sampling, generated theory and encouraged depth and breadth of analysis while building dimensions. This was aptly demonstrated when creating the explanatory matrix on '*professional self-confidence*'.

The background literature (chapter 1) had not provided any empirical evidence establishing the degree of nurses' confidence while caring for deteriorating patients. The interview transcripts suggested it as an influencing factor. Theoretical sampling provided a channel to establish the significance of '*nurse confidence*' and its relationship to decision-making from a variety of perspectives. Further exploration revealed potential linkages across dimensions and I developed the new dimension '*locus of control*' which later, after more abductive analysis and reasoning, connected with the '*being believable*' dimension. I found my perspectives shifting constantly as the study progressed.

Conventional sampling does not have the flexibility to probe into concepts as they are generated, whereas purposive and theoretical sampling maximised my opportunities to develop concepts in the form of dimensions and discover the interplay between them. It was important that my decisions responded to the data and that I remained transparent and flexible throughout. The

example below shows how I utilised the constant comparative method with dimensional analysis to guide sampling decisions.

Example: The participant was describing how she had cared for a patient who was critically ill. She was sensitive to any cues and processes she followed as she looked after the patient.

“I just want her to go to ITU so they can sort you out coz I can’t do anymore than I have done. Um, I think the doctors were struggling as well and didn’t know”.

I made an analytical memo that she felt out of her depth and anxious. I asked how she interacted with the sister on duty regarding this patient (the dimension - *referring on*), and whether the doctors present affected how and what she was thinking in this situation. It transpired she did not feel in control of the situation and was fearful. This led me to consider ‘*control*’ as a relevant dimension. I looked for linkages with other participants’ data regarding issues of control and discovered further similar data. There appeared to be two properties of this dimension: ‘*in control*’ and ‘*out of control*’. I then consulted the literature and discovered the concept ‘*locus of control*’ which named the dimension. From this, the properties ‘*internal locus*’ and ‘*external locus*’ emerged. Data populated the table under each of these headings. This enabled me to form a hypothesis which was: *External locus prevails and causes anxiety to the participants in being believable or feeling pressure when building their case in uncertain clinical situations.* This led to further questions including:

- Is their locus of control making them search for more data to be believable and gain control?
- What is their professional confidence? – Compare across dimensions
- Are there people not tuned into this event?
- Who are these people/players?
- Is there a pattern relating to certain characteristics of participants?

From this '*professional self-confidence*' was developed as a construct and led to the search for participants of different experience and seniority to expand it further. '*Locus of control*' was compared to '*being believable*' and '*building their case*' dimensions. Patterns were sought between these concepts to determine if one was, in fact, part of the other. Links were also made to the literature and similarities were noted with the findings of Andrews and Waterman (2005, 2005a). '*Locus of control*' was temporarily elevated to the central organising perspective but did not warrant remaining there. A theoretical explanation was posited which stated:

Perceiving that others have control led to a disjointed approach to care with nurses feeling anxious and powerless resulting in an inertia that caused delays in treatment plans, posing risk to the patient. This was coupled with an overwhelming need to find ways of building the case and convincing others of findings. This is linked to low professional confidence.

'*Locus of control*' was designated as a property of the mode of practising called '*Crescendo of Care – Abductive Reasoning*'; a component of the substantive theory and explanatory matrix.

This example demonstrates how sampling decisions were guided by the data, how the constant comparative analysis influenced sampling and how the developing constructs emerged from the interviews. It also shows how, as analysis progressed, the level of abstraction increased until a theoretical explanation was reached. The next section discusses the research setting.

4.4 The Research Setting

The study was conducted in a district general hospital situated in southern England. Two acute care wards were the setting for the first and second phases of data collection. The surgical ward where the fieldwork took place in phase one comprised emergency and elective general surgical admissions. These were patients who had undergone urological and lower and upper

gastrointestinal surgery. Some had spent time in ICU or HDU prior to being admitted to the ward. The ward also received patients from other specialties such as medical patients, or other surgical patients with whom the nurses were unfamiliar when beds were in short supply.

The medical ward, where second phase data were collected, admitted emergencies only, although on some of the fieldwork days surgical patients were present due to the lack of beds on the surgical ward. This ward was the designated respiratory ward for the hospital. Patients with tracheostomies⁸ were admitted to this ward. The ward was the designated clinical area for patients requiring non-invasive ventilation respiratory support. Many patients here were acutely unwell, requiring supplementary oxygen, close monitoring and were at risk of deterioration. Both wards received patients directly from the ICU following a period of critical illness.

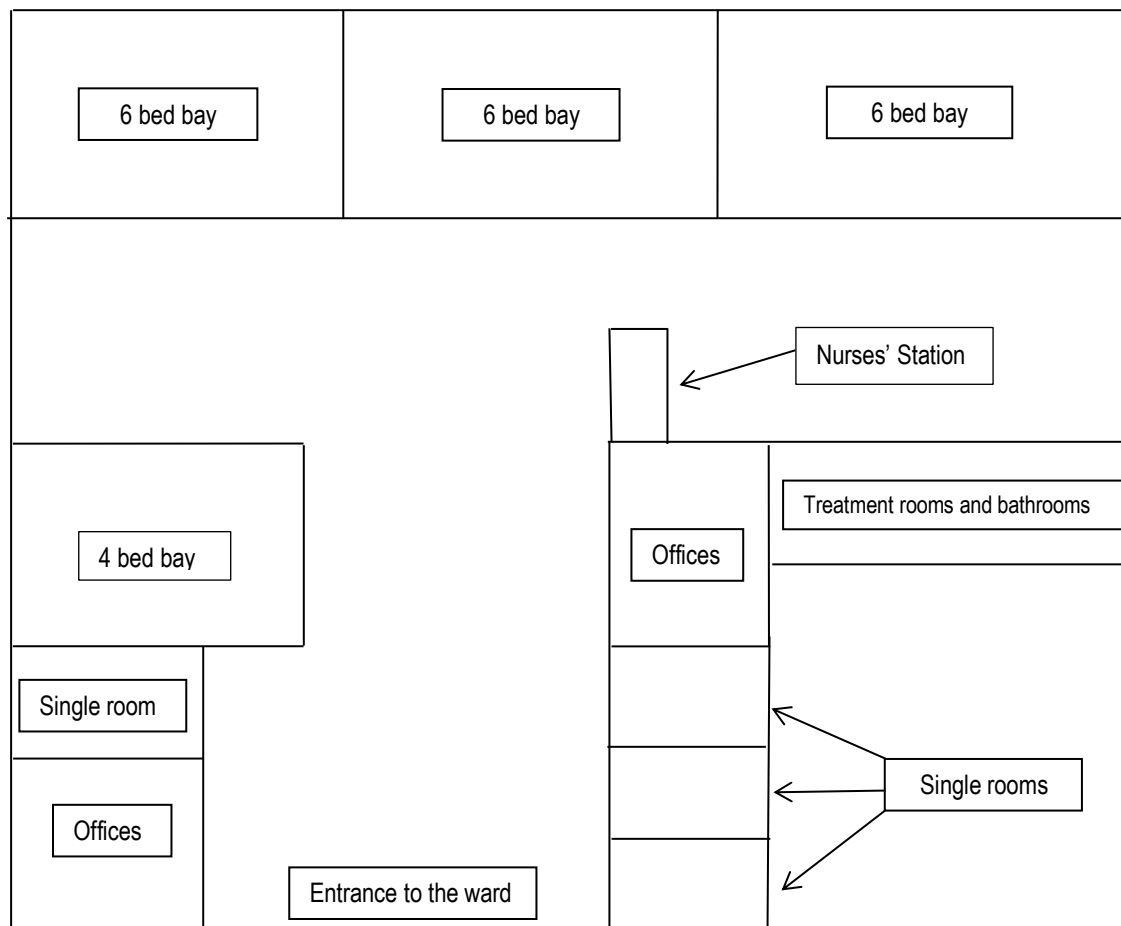
The two wards had identical layout (Figure 4.1 – Ward Layout - overleaf). They comprised 26 beds arranged in 3 bays of 6 patients and 1 bay of 4 patients plus 4 side rooms. Three bays were adjacent to one another with another bay opposite the nurses' station on a wide corridor perpendicular to the 3 bays creating a T shape. Side rooms were situated further along the corridor nearer the entrance to the ward but further away from the nurses' station. Extra beds were placed in the bay window area of the wards when the hospital needed extra capacity, e.g. during busy winter months. This was a temporary arrangement during periods of extreme bed pressures and explains why some participants refer to more than 26 patients in their ward in some of the interviews.

The 'nurses' station' was situated opposite the central bay, but perpendicular to the ward entrance housing the side rooms and a 4-bedded bay. This was significant for nurses because direct visibility of all patients was not possible. Nurses mentioned needing to be in close proximity to sick patients, which became the dimension '*close proximity*'. From the nurses' station staff were

⁸ A tracheostomy is a stoma in the trachea that acts as an artificial airway. It must always be patent for the patient to be able to breathe effectively. It requires close monitoring, frequent suctioning and patency checks.

only able to see patients in 2 of the bays. Typically, nurses cared for and monitored the patients who they perceived to be the sickest in the bays closest to the nurses' station where they were visible and which appeared to be the hub of the ward. However, this was not always possible.

Figure 4.1 Ward Layout



4.5 Methods of Data Collection

Data collection methods needed to be congruent with the philosophical assumptions of the paradigm I used (Crotty 1998) and needed to provide relevant data about the participants' experiences of the phenomena under investigation. Data collection took place over a period of 18 months from May 2009 until December 2010. In accordance with the principles of dimensional analysis and grounded theory, data collection and data analysis took place concurrently (Schatzman 1991). I gathered data in the field using semi-

structured interviews. The stipulation by the REC was that I was not to use observations as data. I devised a novel approach and took field notes in the form of analytical and theoretical memos that became prompts for my questions during the interviews.

4.5.1 Theoretical Sensitivity

Theoretical sensitivity relates to the researcher's level of insight into the research area, and how attuned they are to the nuances and complexities of the participants' world. It influences how theoretically and conceptually a researcher can think while working at a high level of abstraction (Mills et al 2006). Glaser (1978) refers to '*tabulae rasae*' or 'clean slates' when entering the field. In other words ensuring that the researcher is not influenced by prior hypotheses and biases. He believes this enhances theoretical sensitivity allowing researchers to fully immerse themselves in the data. Glaser (2011) discusses how novice researchers have difficulty in moving from a descriptive level to conceptualisation. I identified with this issue. Schatzman (Bowers and Schatzman 2009) believed that analysis occurs naturally in everyday life when solving mundane problems, and that research analysis is similar in kind to this natural analysis. Grounded theory experts have suggested that the foundations of generating theory stem from the insights of the researcher (Glaser and Strauss 1967, Schatzman 1991).

Developing theoretical sensitivity was a significant factor in this study. My prior subject knowledge hindered to some degree my ability to form conceptual connections and thus develop an explanatory framework. Being so close to the field made it difficult for me to '*fly above the data*' and therefore draw truly abstract concepts. My inexperience in undertaking qualitative research may have influenced this. Schatzman (Gilgun 1993, Bowers and Schatzman 2009) talked about how researchers tend to view the data through the lens of their own discipline initially: for example anthropologists see culture, psychologists see psychology constructs. The danger is that concepts are derived from the researcher's discipline rather than the data. There is a role for both the perspective of the informant and the researcher;

and being reflexive is paramount to preventing perspective being mistaken for 'received' conception and prior assumptions being thought newly discovered truth (Bowers and Schatzman 2009). This resonated with me as I initially struggled to discard the perspective of a critical care nurse when analysing the data. I returned to the literature on conceptualisation and reviewed examples of abstraction and conceptualising. After a lengthy practice period, I gradually began to see the familiar as strange.

Discussion during supervision prompted me to use a musical metaphor to help address my difficulties in adjusting my theoretical lens. I re-evaluated the matrices I had developed and used this metaphor to look for patterns and linkages and to redraft matrices. The questions I posed of the data included:

- What was the tempo, allegro or lente i.e. how frantic or calm was the ward environment?
- Was everyone working at the same tempo?
- Were there times when the tempo changed?
- Who was working at a different tempo and why?
- Was everyone in tune?
- Was everyone playing from the same music, or was classical mixed with jazz causing dissonance? What does this represent theoretically?
- Who was the conductor, thus in charge of proceedings?
- Who was the barely audible, lone triangle and what is the impact of that (the deviant case – flip-flop technique).

I also considered ideas developed from literature outside the field of acute care nursing. This formed part of the constant comparison technique. Linking with disciplines such as counselling and psychology facilitated a creative iterative development of concepts, links and theoretical explanations. In line with the constant comparison method and the creative stance that Schatzman encouraged (Gilgun 1993), I also took advantage of visual tools such as 'google images' and online dictionaries and thesauruses to develop sensitivity. These are discussed in section 4.7.

An example of being inspired to consider other disciplines' work is the development of the dimension '*positioning theory*' which was analysed in this way. This dimension was created following analysis and asks whether professional status, boundaries or other related issues affected the way nurses made decisions. The name of the dimension and its properties came from a review of the literature. Memos were made considering individual positions within the metaphorical orchestra, for example, who took the role of conductor, what role did other participants assume and how did this impact on their performance. Linkages were also made across other dimensions, for example control is a prominent factor that links with '*locus of control*' dimension. The music metaphor resulted in the development of the final theoretical explanation where '*crescendo of care – abductive reasoning*' is one of the modes in which nurses reason when caring for a deteriorating patient. The notion of a crescendo as a building of concern and an increase in anxiety and urgency was found to influence the way nurses reached their decisions and the actions they then undertook at this point in the patients' journey.

4.5.2 Memo Writing

Memos have been referred to as the mortar between the building blocks of data (Stern 2007, Birks and Mills 2011). Making memos is the process by which a researcher keeps track of what they are thinking about the data. They enable the researcher to interpret the data by asking questions of it (Hoare et al 2012). Throughout the whole of the research process I wrote memos and kept a record of my thoughts, feelings and insights. This was key to maintaining a reflexive approach enabling me to identify what influenced my decisions on data salience and relevance. The memos were both analytical and theoretical as the analysis progressed and they explained the formulations that developed (Kinsman et al 2009). This process of data organisation, conceptualisation and abstraction, including question and dimension development exposes my decisions as analyst creating an audit trail (Schatzman 1991, Cooper et al 2010). The memos serve as a

contemporaneous record of my developing theoretical sensitivity (Hoare et al 2012).

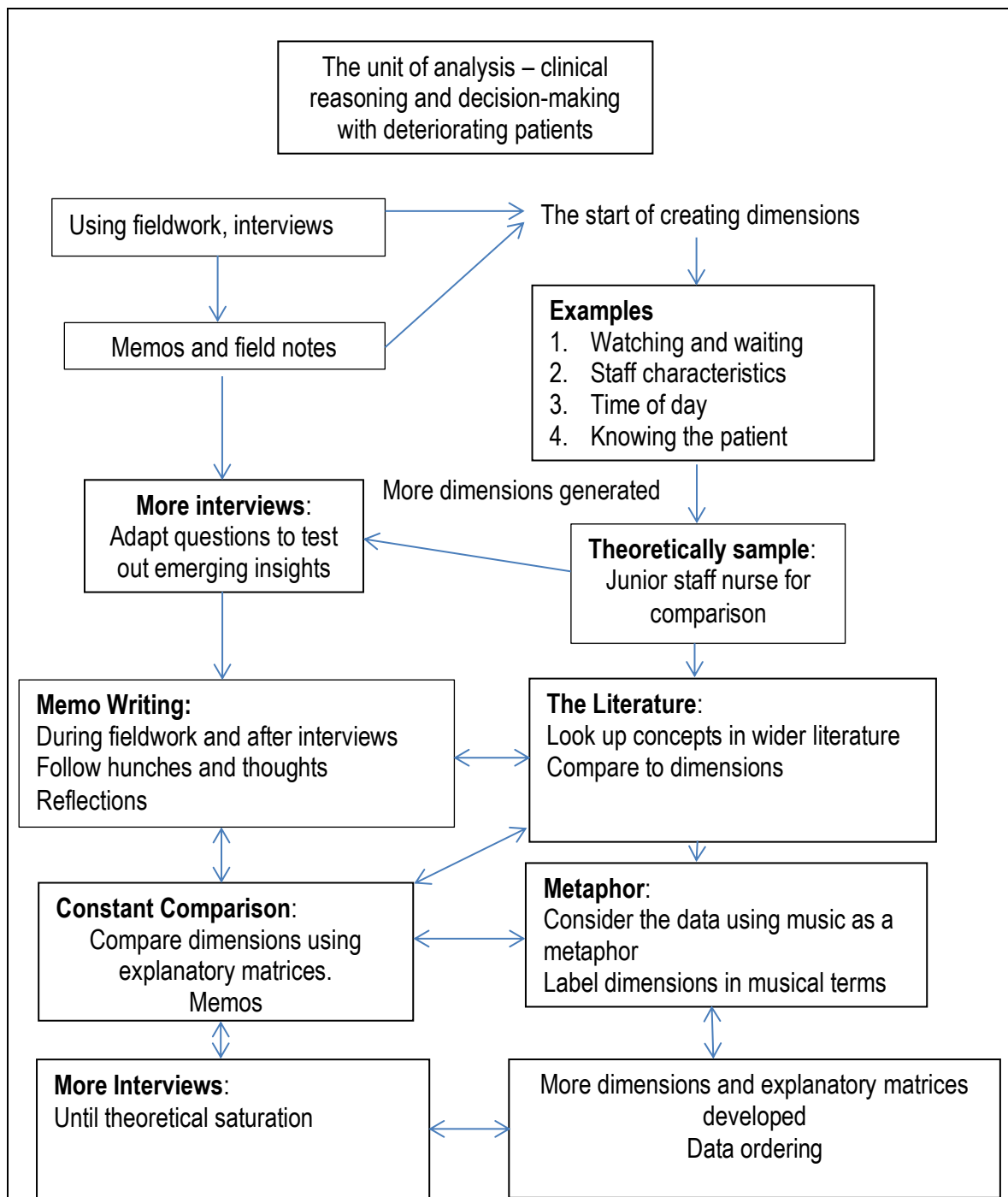
Memos were written during the periods of fieldwork, the interview process and transcription, and as new ideas occurred to me. Memo writing was also used as I populated the dimensions and later formulated the explanatory matrices. As I read and examined the literature, memo making was a constant activity in order to assist me with abstraction and conceptualisation. Table 4.3 gives examples of the sort of questions I asked myself as I wrote memos.

Table 4.3 Memos – Questions I Asked Myself

- What is going on here?
- Why is this so?
- What is it about this area of study that seems more striking?
- What is the main problem?
- What is this an example of?
- When does it happen?
- Where does it happen?
- With whom?
- Under what conditions?
- With what consequences?

In addition I used diagrams to order the data, both in the tabular documents and the explanatory matrices. '*Post-it*' notes were helpful in displaying the varying dimensions and properties as they were designated the central perspective during analysis. This created a visual display of the known and the unknown enabling me to conceptualise the data in a more abstract way. Overleaf Figure 4.2 (adapted from Hoare et al 2012) is an exemplar of the techniques I used throughout the study to acquire theoretical sensitivity.

Figure 4.2 Acquiring Theoretical Sensitivity



As Figure 4.2 illustrates, a variety of methods were used to develop theoretical sensitivity through data immersion:

- Fieldwork notes: Analytical and theoretical memos were used throughout to prompt and guide the interview questions. These memos

enabled me to develop concepts that I explored in the interviews to gather the data. I also used field notes to make reflective and reflexive memos and to note down relevant facts such as the layout of the wards, skillmix on duty that day, numbers of nurses present. This allowed me to sensitise myself to the work and arrangements in that hospital which were sociologically strange to me.

- Interview data: Listening to the interviews, transcribing them, re-listening and re-reading while formulating the dimensions and their properties.
- Literature: I used the literature throughout the study to theoretically sensitise. I focused initially on the suboptimal care literature which introduced me to the decision-making and clinical reasoning literature. This enabled comparison across studies and assisted with theoretical sampling decisions and the development of new lines of enquiry. It also allowed me to explore emerging links not directly related to the subject matter. An example of this occurred when exploring the dimension '*staff characteristics*'. The data were telling me that nurses retreated to their perceived role and position within the ward hierarchy and that this affected the way they acted on a hunch or clinical problem. This led me to explore the sociological concept '*positioning theory*', and I reviewed the dimension through this lens 'trying out' its salience in an explanatory matrix.
- Other sources: The use of images, photographs, diagrams and websites enabled a breadth of perspectives through which to view data. Surprising angles sometimes emerged. Using the music metaphor as discussed earlier was a key strategy to promote conceptual thinking about data patterns. These helped me view the data as sociologically strange and facilitated cross case comparison.
- Personal and professional experience: Schatzman acknowledges the perspective of the researcher in analysis (Gilgun 1993). The strategies

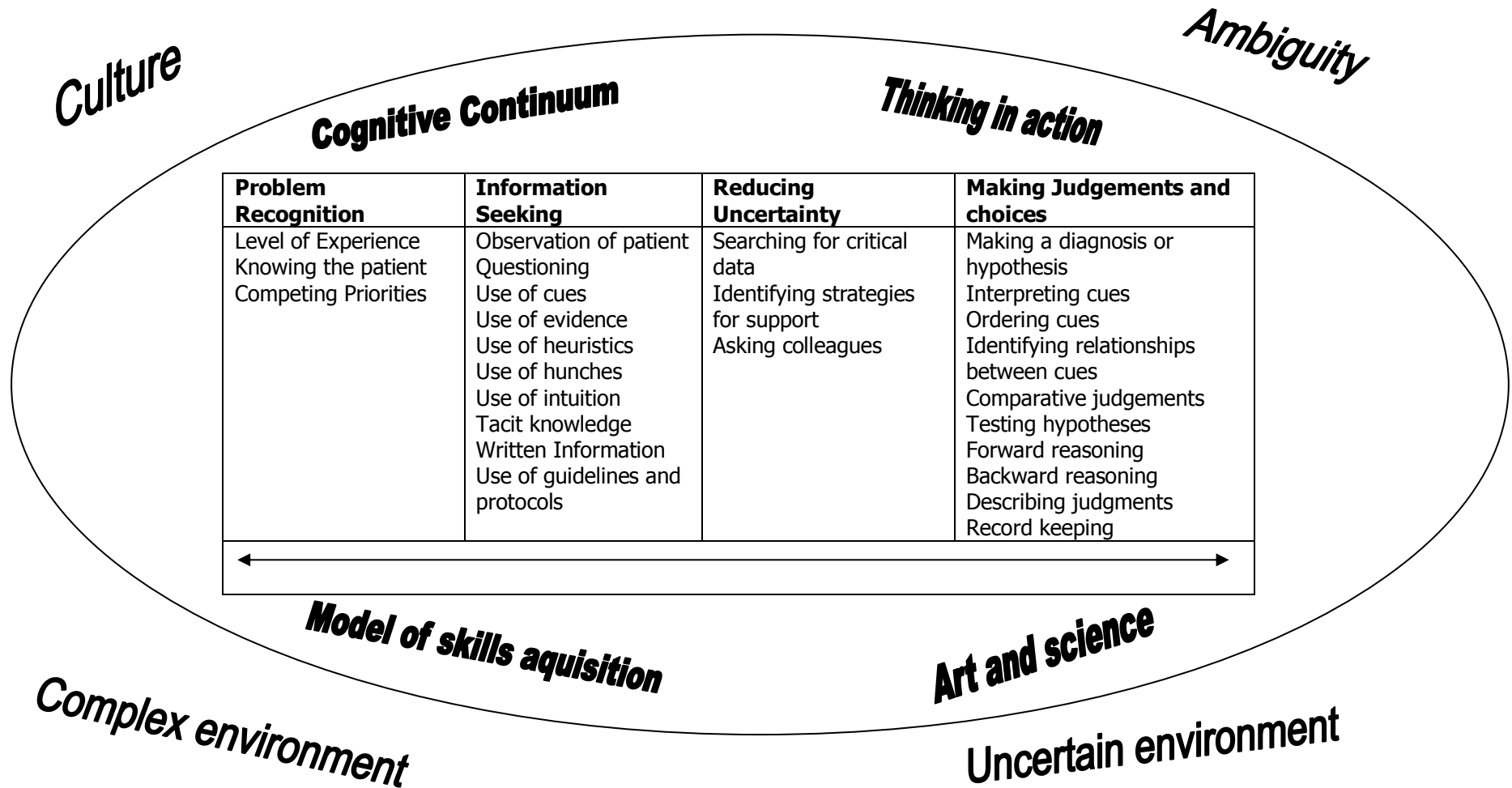
above worked in synergy with my personal and professional experience to generate a broader understanding of the social processes in play. I used action learning sets, supervision and 'critical friends' to help me practise reflexively and incorporate any thoughts and ideas generated into the theoretical sampling process.

4.5.3 Fieldwork

A convenient date was arranged with each participant for me to undertake fieldwork. I shadowed the participant for part of a shift assuming the role of a first year student nurse. Typically the session lasted 2 hours. During this time I did not participate in any of the activities undertaken and I attempted to minimise any inconvenience associated with my presence. I used the time to sensitise myself to aspects of the field for consideration in the interview. To help me make sense and appraise the myriad of interactions, to create meanings and frame actions, I created a diagram prior to commencing the fieldwork that summarised the available decision-making literature. This enabled me to focus at a conceptual level and was aimed at enhancing my theoretical sensitivity (figure 4.3 overleaf). The diagram represents the literature in the following way:

The oval represents the decision-maker. Surrounding this person are factors that pre-exist in the ward environment, such as the culture and the ambiguous nature of the clinical area. Within the oval are depicted the thinking strategies a practitioner may use as described in the literature, in other words, the 'toolbox' available to them. In the rectangular box are the specific actions people take when faced with a clinical problem and how they undertake the problem solving process. The diagram acted as a prompt to draw my attention to concepts that may then be reviewed at the interview.

Figure 4.3 Decision-Making Summary Diagram



Observation characterises qualitative research including grounded theory, and is considered integral to fieldwork (Fetterman 1989, Germain 2001, Moore and Savage 2002). It is an effective way of finding out what people do in particular contexts, the routines and interactional patterns of their everyday lives (Darlington and Scott 2002). The stipulation of the REC of allowing me to shadow nurses in the field but not use my field notes as data required a creative way of managing a complex situation to illuminate what was occurring. My time in the field was used to expose myself to the cultures, routines, types of patients and different teams and systems in place. As per REC approval I made analytical and theoretical memos that I used to enable me to see the strange as familiar sociologically. These were used to generate questions for interview afterwards with the participants. This allowed me access to the factors and interactions contributing to clinical reasoning and decision-making with patients whose conditions were declining and to develop conceptual levers. I functioned with minimal participation in the workplace activities which lessened the Hawthorne effect because verbal and non-verbal interactions between myself and the participants were minimised (Polit and Hungler 1999). My activities during the periods of fieldwork included:

- Noting aspects of the clinical environment such as layout, number of patients in a bay, skillmix on duty, the location of the patient in relation to ward layout
- Recording analytical memos to trigger interview questions post fieldwork
- Noting any changes or developments in my thinking about the phenomena or the actual research process (later written up in my Reflective Diary)
- Actively reflecting upon my personal fieldwork experience and my perceptions of the participants' experiences of being shadowed (recorded in my Reflective Diary).

I undertook the fieldwork periods as a student researcher, out of uniform and with no indication given of my professional role of consultant nurse in critical

care outreach. This was to minimise any potential power relations issues. The participant information sheet emphasised that I was not attempting to make any judgements about the participants' clinical decision-making skills, but was seeking to understand what caring for sick patients was like from their perspective. I attempted to maintain a non-threatening, collegial manner by being friendly and sensitive to the participants' feelings and remained open and responsive to questions regarding my research. However, despite these measures, it is possible that participants altered their behaviour to appear in a favourable light to me as the researcher, and this is a potential drawback of undertaking fieldwork. It could be argued that if my presence raised their awareness of the way they reasoned then potentially this would promote greater access to their thoughts during the interviews.

Fieldwork is a very tiring process which requires a lot of concentration. It also takes time to understand the patterns of other cultures, to grasp their values and understand their communications. Hammersley and Atkinson (1995) warn about the risk of the '*it's all happening elsewhere*' syndrome. This is where the researcher struggles to limit time in the field, and does not prioritise thinking theoretically about the data. This temptation was acknowledged and I ensured that I spent no longer than 2 hours on the ward followed by the participant interview. I also did no more than one session of fieldwork per visit. A clear and well-planned sampling strategy, as previously described, contributed to a successful fieldwork period.

4.5.4 Limitations and Issues of Fieldwork

There are a number of limitations that have to be considered and addressed when using fieldwork in this study. Spradley (1980) warns researchers that the more they know about a situation, the more difficult it is to see the unfamiliar. This study took place in a hospital where I did not work. Although I was familiar with the subject matter, this particular research setting was new to me. A possible tension for me was seeing things more clearly from the inside or going 'native' which can damage impartiality and affect the value of the theoretical lens. Analysis of my subjectivity through the judicious process

of reflexivity is an integral part of the research process (Birks and Mills 2011). I controlled what was recorded and analysed filtered through my eyes and senses (Corbetta 2003). I was constantly mindful of this potential bias and actively managed myself reflexively (chapter 3 section 3.8 – Managing the Reflexive Self).

Researchers in the field are unable to capture and interpret every event that occurs and may only capture what they deem relevant, possibly allowing important information to go unnoticed. In order to alleviate this I developed the summary diagram of the decision-making literature at that time (previously discussed in section 4.5.3) to sensitise me and act as a conceptual lever during fieldwork. I used the diagram to trigger me to attend to specific aspects whilst remaining open to what was happening in the field. Memoing was central to guiding decisions about fieldwork periods. For example I chose to visit 'out of hours' i.e. weekends, bank holidays and evening time to explore the impact of this contextual factor on nurses' clinical reasoning and decision-making after it emerged as a factor from the interview data.

Using reflective summaries of the shadowing experience prompted the generation of working hypotheses and ideas to explore at the interview immediately afterwards. This allowed me to think more conceptually, less literally, and to conduct the interviews more thoroughly than if I had not been in the real world at all adding depth and breadth. Grounding the experience in the field and exploring the issues in this way enabled me to be present with the participants but not record data from the clinical field nor involve staff who had not had the opportunity to consent. As Schatzman and Strauss (1973) state, the researcher is using all his senses, watching and listening but is also thinking and analysing. This is how I approached fieldwork and memoing for this study.

The next section discusses the interview techniques I used. It discusses the pros and cons of interviewing as a method in qualitative research, explaining the strategies I employed and how I managed the data once obtained.

4.5.5 Interviews

In grounded theory the interview serves very specific purposes. Firstly it is used to gather a narrative of the experience. Secondly, it is a vehicle to develop a conversational relationship with the participant about the meaning of the experience.

In-depth interviewing is a commonly used method of data collection that allows the qualitative researcher to obtain a range of perspectives about a phenomenon. The interview explores feelings and attitudes, and also gives the opportunity to make explicit that which had been implicit, i.e. tacit perceptions, feelings and understandings (Gray 2004). People are experts on their own experience (Darlington and Scott 2002). This is particularly relevant with clinical decision-making, as clinicians do not always verbalise their thoughts as they practice. Face-to-face interviewing permits flexibility, allowing both parties to explore the meaning of the questions and answers involved: it is an active meaning-making process (Darlington and Scott 2002). The subjective nature of interviews and the active construction of knowledge are consistent with the paradigm and methodology chosen for gathering data.

The grounded theory interview is dependent upon the ability of the researcher to move through the interview with the participant (Birks and Mills 2011).

There are various ways of conducting research interviews, including structured, semi-structured and unstructured interviews (Robson 2002a). In grounded theory interviews, less structure is preferable so that the researcher can follow opportunities to generate the data for the developing theory (Birks and Mills 2011). Schatzman and Strauss (1973) refer to the interview process as a conversation. Both Birks and Mills (2011) and Schatzman and Strauss (1973) suggest not formally ending the interview process completely thus inviting the researcher to return to the participant (and indeed, the participant to return to the researcher) if further theoretical insights warrant greater exploration. I chose a semi-structured interview format because it provided breadth and richness in data whilst giving the participants freedom to respond and to narrate their experiences without being anchored to specific answers,

as required in structured interviews (Schatzman and Strauss 1973, Morse and Field 1995).

I used face to face interviews for 14 participants. 2 participants chose telephone interviews (Participant 5, 2nd interview, and Participant 14). This was also the most practical method due to prevailing harsh winter conditions. In total I undertook 16 interviews with 15 different participants, 7 from the surgical ward, 6 from the medical ward followed by 3 further interviews with a further 3 participants from surgical and medical specialties for verification purposes. When I sought informed consent I also asked the participants if they would be happy to meet again in order to gather further data (Schatzman and Strauss 1973, Birks and Mills 2011). All agreed and 1 in particular was approached for a second interview (participant 5) as part of my theoretical sampling and verification in phase 3.

The interviews were held in the ward office away from the clinical area, but still within the ward. All interviews were digitally recorded and I also made notes, including my reflections on my impact as researcher on the interview. An example of these reflective notes can be found in Appendix 11 (Excerpts of Field Notes and Reflective Diary). A topic guide was used to guide the interview, but most importantly the interview questions were guided by the memos made during the fieldwork (Appendices 11 and 12 – Excerpt of Field Notes and Reflective Diary and Topic Guide used). Schatzman and Strauss (1973) advocate a lengthy interview to 'create and seize the conversation' probing for detail, clarity and explanation. The interviews lasted between 35 – 50 minutes. This was a shorter time span than I had planned, but was constrained by the requirement for the participant to return to the ward. Whilst the participant was being interviewed the ward was left short of nurses and other staff had to cover.

I considered how the interview environment might affect the data quality. (Darlington and Scott 2002). Having agreed a mutually convenient time to meet, the interviews took place as soon as was practically possible after shadowing, usually within 30 minutes. I did consider offering another

convenient time to the participant, but chose to accept the ward routine time constraint in order to gather data that was fresh, real time and vivid. There was a danger that recall and memory may have affected the quality of the interview data if there had been a delay between the period of fieldwork and interview.

Throughout the interview, I tried to elicit the information in the participant's own language about how they cared for a deteriorating patient. I wanted to prevent the participant from using language that was not theirs, in other words translating into words they thought would help me understand - translation competence. I used open questioning techniques, referring to comparative situations and revisiting questions where more depth was required, so that implied or expressed feelings could be restated and more examples given (Flick 1998). This sometimes involved discussing a number of patients they had looked after and drawing out differences or similarities in how they managed the situations to uncover their reasoning.

It was important to me to develop a rapport with participants which I felt was essential in order to effectively elicit information (Spradley 1979, Darlington and Scott 2002). Participation in a research study interview is often deeply personal, and can involve the description of a traumatic experience, especially if an episode of care had not gone well for the participant. I felt there needed to be a high level of trust between me as researcher and the interviewee in order for them to feel comfortable sharing private thoughts with me. To this end I developed a checklist of 'interview etiquette' Table 4.4 overleaf (Gray 2004). This acted as my own 'code of conduct' and I reflected on the interview in these terms throughout and after to ensure I had adhered to it.

Table 4.4 A Checklist for Interview Etiquette

Do	Don't
Establish clearly what the interviewee thinks	Do not give any indication to the interviewee of your meanings and understandings or appear to judge responses
Provide a balance between open and closed questions	Do not ask leading questions or questions to which it is easy for the interviewee to simply agree with all you say
Listen carefully to all responses and follow up points that are not clear	Do not rush on to the next question before thinking about the last response
If necessary to either gain thinking time or for the clarity of the audio recording, repeat the response	Do not respond with a modified version of the response, but repeat exactly what was said
Give the interviewee plenty of time to respond	Do not rush, but do not allow embarrassing silences
Where interviewee expresses doubts or hesitate, probe them to share their thinking	Avoid creating the impression that you would prefer some kinds of answers rather than others
Be sensitive to possible misunderstandings and if appropriate repeat the question	Do not make any assumptions about the ways in which the interviewee may be thinking
Be aware that the respondent may make self-contradictory statements	Do not forget earlier responses in the interview
Try to establish an informal atmosphere	Do not interrogate the interviewee
Be prepared to abandon the interview if it is not working	Do not continue if the respondent appears agitated, angry or withdrawn
Gray 2004	

I was fortunate in having the period of shadowing to begin to build trust, a key aspect of effective interviewing (Schatzman and Strauss 1973). I also tried to build trust via assuring the participant that I would listen, would treat them fairly, would respect their limits about what they wanted to say and would treat the data fairly (Darlington and Scott 2002). Traditionally in interview it is the interviewer who has the power, owns the project, and sets the parameters for discussion. However, the participants own the knowledge the researcher seeks and have the power to disclose or withhold. This is why building trust and the collaborative process were important. Courtesy and politeness should prevail during the process of consent and throughout the fieldwork. If the participant feels relaxed, the interview will have a greater chance of being successful. The aim was to enable the interviewee to speak as freely as

possible, in their own terms, about the event and their interactions, plus whatever else they wanted to introduce.

I commenced the interview with details about the participant's career and time on the ward. I then opened the discussion by asking them to tell me about the patients they had been looking after whilst being shadowed. In most cases they told their story enabling me to refer to my topic guide but also pick up on any theoretical points for further probing and exploration. From the outset the interviews yielded much rich data which I used to compare and contrast in analysis. This then guided my questioning in subsequent interviews. I remained open and sensitised to emerging dimensions and insights. At times clarity was sought or confirmation of understanding was requested and more probing questions were asked following specific comments or statements. This is consistent with what Schatzman and Strauss advocated (1973).

I digitally recorded the interviews with the participant's permission. Gray (2004) states that recording interviews is vital. This is in complete contrast to Glaser, who argues that the act of taping detracts from the focus on sensitising to early categories as well as producing vast amounts of superficial data (Birks and Mills 2011). For me, the recording was not purely for recollection, but a tactical decision that offered on-going opportunities to analyse (Schatzman and Strauss 1973). Recording captured the interview freeing me to concentrate on the process of listening and then interpreting and analysing at the transcribing stage. I noted Glaser's view and did not rely on the transcripts alone when re-listening to the recordings. This ensured that the data remained '*live*' as I was able to hear any hesitancy, inflection, tone etc. that gave meaning to the transcriptions and reflected the true significance of the situation to the participant. The recordings became integral to the discovery process illuminating supportive evidence, or highlighting gaps that necessitated further data collection.

I transcribed the interview verbatim. Appendix 13 is an excerpt of one of the interview transcripts. This was supplemented by note taking to capture non-verbal behaviour and to trace important quotations during later analysis.

These notes also acted as a fail-safe in the event of a recording failure. The recording process allowed me to concentrate on the interviewee rather than my notes, which may have been distracting. At the end of the interview, time was made for the participant to 'wind down' via informal conversation. This was to ascertain that they were comfortable with how the session had unfolded. I also offered contact details for support or follow-up if they felt this was necessary as per the PIS Sheet (Moore and Savage 2002).

The two telephone interviews were a convenient device given the circumstances described earlier. Robson (2002a) states that there are higher response rates with this technique, and that there is less of a tendency for the respondent to just give socially acceptable answers. However, the lack of visual clues may cause problems in interpretation (Birks and Mills 2011). This technique was also useful given that many of the participants worked erratic shift patterns.

Despite having designed a comprehensive interview guide, sometimes participants do not offer the depth of insights sought by the researcher. Two of the interviews felt this way. I tried to ask questions in a different style to encourage the participant to relax and open up. On reflection, although I felt I had gained little, when considering the interviews later, and in the light of the divergent examples (Schatzman 1991) it transpired that they were, in fact, very rich with data and added to the dimensionalising I was undertaking illustrating how my perspective shifted during analysis.

4.5.6 Focus Groups

One focus group was held in phase 3 of the data collection for verification purposes. Focus groups are useful for grounded theory development and my intention was to gain more information about the experiences of this particular group of nurses in order to develop my theoretical explanation (Fern 2001, Litosseliti 2003). Focus groups allow a range of opinions to be discussed and group members can influence each other by responding to the ideas and comments of others. The focus group offered a privileged insight into the

participants' world due to its open ended structure (Fern 2001). In accordance with the relevant literature the participants were chosen for a particular characteristic, namely that they had all been exposed to caring for patients who were seriously ill (Krueger and Casey 2000). I felt there was an advantage to have members who knew each other as this meant that the power imbalance between the researcher and the participants was reduced (Young 2011). Although focus groups are not as strong as individual in-depth interviews at providing a fulsome understanding of the participants' experiences, this approach gathered data that supported or refuted my developing theoretical explanations.

The focus group comprised 9 registered nurses with between 2 months and 1 year 3 months experience in acute care areas. This group offered an opportunity to explore my emerging theory from the perspective of junior nurses who had experience in caring for deteriorating patients. Participants with this level of experience had not yet been sought in the study. The focus group was held in the Education Centre and digitally recorded. I also made notes and memos as the discussion progressed. I gave a PowerPoint™ presentation of the explanatory matrices and theoretical explanations built from the current data as a Topic Guide to discussion (Appendix 14). Questions on each slide prompted discussion of each dimension and encouraged the participants to give examples of where the behaviour had occurred in their practice. I also encouraged them to refute any dimensions that they did not feel resonated in practice and that were not a true reflection of the social interactions and processes in play. In fact, they expanded on each of the dimensions and helped clarify and crystallise my thinking further. The data yielded from the focus group was rich and invaluable in developing the substantive theory.

Fieldwork, focus groups and interview are arguably strong in the discovery of information and understanding processes, and the interview technique is easy to use (Bucknall 2003). The disadvantages are a lack of control over the study and the inability to transpose the results to the wider population (Polit & Hungler 1999).

4.5.7 Field Notes

Throughout this research I recorded my experience and reflections as they emerged. Field notes were recorded prior to, during and after the fieldwork session, interviews and focus group. Four types of field notes were recorded during the research process;

- analytical memos
- theoretical memos
- reflective notes
- transcript (interview) notes.

Data sources included analytical memos from the fieldwork periods in the wards, patient and ward documents, published literature, interviews and focus group data. My field notes contained my own reflective responses from the shadowing session and memos relating analytical and later theoretical insights. These were used to guide sampling decisions, enhancing the interview topic guide and to address any ethical issues that arose (Germain 2001, Corbetta 2003). An example can be found in Appendix 11 – Excerpts of Field Notes and Reflective Diary. I included comments regarding my perceived impact as researcher on the research data (reflexivity). For example, I occasionally felt that my presence seemed to affect certain participants' behaviour. Making a note of these incidences helped with the analysis and validity checks later in the study. I felt this encompassed reflexive monitoring of the study as it progressed (Hammersley and Atkinson 1995). In order to identify the purpose of the notes, different coloured pens were used. For example black ink for the descriptions, red for the analytical memos and green for reflections. All were dated and timed for later reference.

My note taking in the field served:

- To facilitate reconstruction of the physical environment in which the participants worked
- To record aspects of the interviews and focus group that could not be discerned from the audio recording, such as body language, tone of voice, environmental distractions
- To record details that emerged after the recorder was switched off
- To provide an opportunity for reflection and self-evaluation
- To record my thoughts, insights, ideas and observations.

Notes were made whilst in the field, or as soon as possible after the event (Hammersley and Atkinson 1995, Darlington and Scott 2002). This was to ensure that the vividness of the event was not lost and that the risk of subconsciously changing the data to 'fit' emerging theory or ideas due to undue reliance on memory was minimised (Hammersley and Atkinson 1995). To log a particular event before the memory faded, I retreated to an office or room within the ward to write up notes before returning to the field. Alternatively I wrote notes up as soon as possible after the fieldwork period, certainly before the end of that day.

4.5.8 Managing my Role as Researcher

During this research, I was both the principal data collector and working within the same profession as most of the participants. This gave me several advantages. It helped foster trust and confidence in the researcher-participant relationship and established an early rapport with the participants. This yielded greater access into their clinical world. I recognised their 'jargon' which prevented the need to constantly ask for clarification. However, the disadvantage was that I might assume meaning rather than hear what the participants were telling me. I addressed this by reflecting back my understanding of what they had said and seeking their confirmation I had understood correctly all that I had seen and heard. I maintained field notes

which I could consult when transcribing. The focus group offered a further opportunity for ensuring the accuracy of my interpretations. I was acutely aware of the risk of 'going native'. My field notes recorded my reflections from the field and served as a reflexive memo to capture the impact of data collection on my own perceptions and interpretations of the research experience. These strategies were essential in order to maintain rigour and a clear audit trail within the research, and to make transparent decision-making around interpretation and the on-going generation and analysis of the data (Denzin and Lincoln 2000, Finlay and Gough 2003).

4.5.9 Theoretical Saturation or Sufficiency?

Theoretical saturation is the point when no new information is gleaned from theoretical sampling. It is when there is a depth, breadth and understanding of the dimensions, their relationships to other dimensions have become clear and a consistent level of repetition regarding the concepts and their relationships is evident (Kools et al 1996). It is a claim that relies on the researcher's *conjecture* that a dimension or category is saturated (Charmaz 2006, page 114). There is a risk that categories are saturated when they are not, especially in small studies that may make hefty claims (Charmaz 2006). Theoretical sufficiency contends that dimensions are *suggested* by data. Although theoretical saturation is what a grounded theorist should aim for (Charmaz 2006), I prefer to use the term theoretical sufficiency to describe the point I reached when through dimensionalising, integration and reintegration no new patterns were emerging. I felt this gave a better fit to how I conducted this study, learning and growing as it progressed, based in a study setting at a point in time within one sub-world of acute care nursing.

Explanatory matrices were compared and viewed from differing perspectives. They were trialled as the central organising phenomenon and verification was sought from the participants when it became apparent no new concepts were emerging. It was at this point I decided theoretical sufficiency had occurred and that additional data would most probably be redundant and unproductive (Kools et al 1996). Mindful of the arguments around saturation and

sufficiency and that some authors suggest saturation may never be fully achieved I consulted the '*suboptimal care*' and '*decision-making*' literature which advanced nothing new. I also tested out my emerging theory at an international conference of critical care and ward nurses, (see section 4.8.3) for confirmation of the 'workability' and potential usefulness of the emergent theoretical ideas (Glaser 2010b, Andrews 2012). Once confirmed, I drafted the theory.

4.6 Data Management Strategies

A large volume of data was amassed through the various collection methods. It was therefore, imperative that that data were managed in a way that facilitated easy access and effective back-up and maintained participant confidentiality at all times.

4.6.1 Audio Recording

A Phillips™ digital recorder was used to record the interviews and focus group. It is unobtrusive with a built in microphone and was purchased with some research funds received from my Trust. The interviews were then stored on a password protected computer using the digital software SpeechExec Dictate™. Although there was potential for the recording and the device to adversely influence the participants, placing the device in an unobtrusive place reduced this possibility. The recording was a valuable tool, as manual note taking during the interviews and focus group and field notes alone would not have been sufficient to achieve the methodology's aims.

4.6.2 Data Processing and Transcription

All interviews were transcribed verbatim and these transcriptions, along with all field notes were used for data analysis. Appendix 13 is an example of one of the interview transcripts. All interview transcripts were checked for accuracy by reading and listening to the recordings again and analytical notes

were recorded. Field notes were not typed but were available for review in hard copy when needed during the analysis.

4.6.3 Storage

All participant data was stored electronically on a password-protected computer. Each individual Word™ document was also password protected. My personal reflective diary was also saved onto a password protected computer. Hard copies of field notes and memos were stored securely at my home.

4.6.4 Managing Quotations

The interview quotations form part of the research data. These are presented in chapter 5 (Findings) to illustrate the theoretical and conceptual points being made. Some quotations were edited to achieve brevity and clarity or to make explicit the theoretical argument being supported. In addition, English was not the first language of some of the participants. An example from participant 4 is given below. The verbatim transcript is as follows:

"I did, because previous day it was like 6 hourly they did and like normal things, but I noticed that she was a bit, so I did every 2 hourly to see if there is much deterioration and she is going tachycardic, any of those symptoms like when you are looking after a sick patients like you observe everything all those things like. So I did 2 hourly but it was quite stable".

The edited quotation below has removed the colloquial language:

'The previous day we did her observations 6 hourly, and they were normal, but I noticed that she was a bit worse so I did them 2 hourly. I did them every 2 hours to see if there was any deterioration'.

The key point, which is her decision and action to monitor the patient more closely, is retained without distracting the reader with additional vocabulary

that that did not enhance her meaning. Where quotations have been shortened but not edited the use of '....' is made in the text presented.

4.7 Data Analysis

In keeping with the adopted methodology, data analysis methods were developed from the grounded theory principles in particular dimensional analysis as propounded by Leonard Schatzman (Schatzman 1991). There were several stages of analysis as shown in Table 4.5. Throughout all stages there was on-going interpretation of the research text and the phenomenon of decision-making and clinical reasoning.

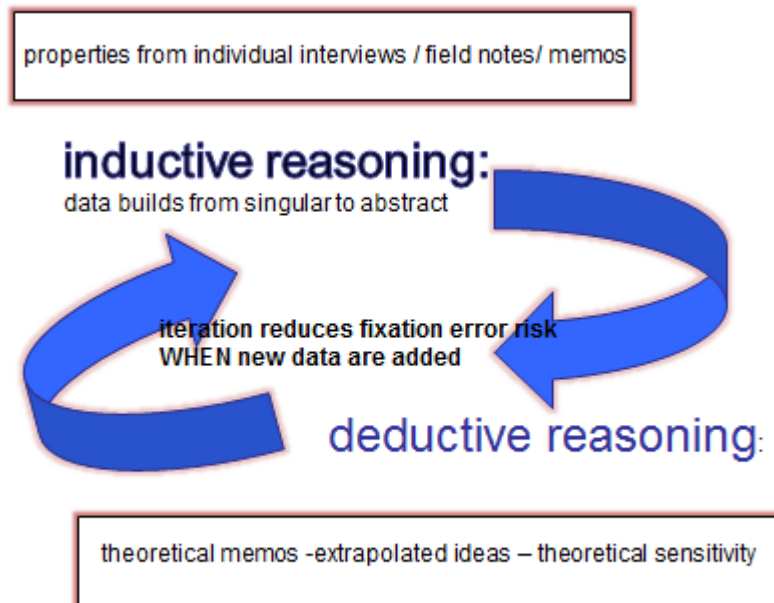
Table 4.5 Stages of Data Analysis Undertaken

Identifying Dimensions	Data is labelled and grouped into dimensions The properties of the dimensions are identified The properties and dimensions are compared
Differentiation	The dimensions are organised and the significance of the data bits and their inter-relationship is determined Relative values are assigned to dimensions, identifying their relevance to the phenomenon under study Abstract concepts are identified The absent or uncharacteristic case, which will illuminate that which is present in other data, is sought The data is interrogated from a new perspective which may illuminate new dimensions, conflate existing ones or recognise new relationships between dimensions Return to the literature Maintain theoretical memos to explain formulations developed
Developing the Explanatory Matrix	The critical mass of dimensions has now been collected The data are ordered into matrices that illuminate the explanatory power of the dimensions Links are made between the dimensions Data are ordered into conceptual components - conditions, processes and consequences - framed by the perspective (lens) through which they were analysed Theoretical sampling is undertaken to test the conceptual linkages in the developing theory, including a return to the literature The central organising phenomenon is set out

	The explanatory matrix provides a logical configuration that provides meaning, elevating analysis beyond description into the realm of explanation
Integration/reintegration	Takes place following theoretical saturation The ' <i>story of the case</i> ' is written situating the theoretical explanation around the central organising phenomenon to build the theory Patterns and relationships between the dimensions are described and explained The dimensions and components are integrated according to the central organising phenomenon The grounded theory is written
Adapted from Kools et al 1996, Endacott et al 2010, Scholes 2011	

I continually oscillated, juxtaposing assumptions with the research data and constantly cross-checking my interpretations with the original transcripts (shifting perspectives). Throughout this process I strove to maintain closeness (or faithfulness) to the participants' constructs, grounding interpretations in the data. Dimensional analysis of qualitative data is iterative and circular, and there is an inseparable relationship between the data collection and data analysis processes (Kools et al 1996). This constant comparison is a key feature of naturalistic inquiry and of dimensional analysis (Strauss and Corbin 1990, Schatzman 1991, Erlandson et al 1993). Figure 4.4 (overleaf) depicts the reasoning I undertook as I collected and analysed data (Scholes 2011). Throughout the research this thinking is interjected with working hypotheses. The cycle was repeated and the conceptual level of thinking grows with each hypothesis considered until the theoretical explanation and central organising perspective are illuminated.

Figure 4.4 Abductive Thinking in Data Analysis



(Scholes 2011)

Data analysis is presented in this section broken into three phases of research and grouped according to the four stages of dimensional analysis:

- identification of dimensions
- differentiation
- explanatory matrix
- integration/reintegration.

4.7.1 Data Analysis Phase 1 - Identification of Dimensions

I read and re-read the transcripts and repeatedly listened to the interviews. On an Excel™ spread sheet I noted what the main dimensions initially appeared to be. The labelling was derived from the participants' own words. For example, participant 1 said:

“I knew the patient, I knew what his wound looked like.”

Later participant 3 said:

“We were trying to get her out of bed, she didn't want to know. Not her.”

I had made an analytical memo that knowing the patient was a factor in the way the participants reached decisions and labelled the dimension '*knowing the patient*'. I tried to ascertain its properties and compare and contrast across other dimensions to detect any theoretical bearing on clinical reasoning and decision-making in this context. Later I used more abstract and conceptual concepts to name dimensions, derived from the literature. This resulted in an initial set of 23 dimensions and properties identified from interview analysis. They all related to the way participants made decisions when concerned about a patient. These are shown in Table 4.6.

Table 4.6 The Initial Set of 23 Dimensions and Properties Post Phase One of Data Collection

Dimension	Properties
Day of the Week	Weekdays Weekends Bank Holidays
Time of Day	Morning ward rounds Night shift – less staff on duty Afternoon – busy, post operative patients return to the ward
Staffing Levels	Enough staff Not enough staff

Dimension	Properties
Patient Characteristics	Observations within normal limits Something wrong Change in character
Knowing the Patient	Knowing them as a person Knowing what physiologically is normal for that patient Knowing when something has changed with the patient Knowing the type of patient (condition) to be concerned about
Watching and Waiting	Frequency of observations Monitoring Repeating observations and documenting them Implementing interventions and assessing effect Taking tests and samples to measure
Referring On	Referring to the doctor Referring to a colleague Referring to another professional When a referral does not happen
Missed Cues	Not acting on a sign or symptom Uncertainty about the signs and symptoms Confidence Lack of confidence
Assessment Strategies	Location of the patient PAR Score Routine Anticipation Searching for clues
Team Members	Close team work Poor team work Hierarchy Culture of the ward and team
Receiving referrals	Actions on receiving a referral
Feeling Overwhelmed	Negative feelings Frustration Anxiety and panic Other feelings
Nurse Concern	What concerned nurses?
Not Trusting Others	Checking Self-protection
Gut Instinct	Just knowing Experience Knowledge
Knowledge	Experience Using what has been taught
Specialty	Caring for a patient of own speciality Caring for a patient whose condition the nurse was less familiar with
Handover	Use of handover Routine of handover

Dimension	Properties
	Purpose of handover
Staff Characteristics	Length of time qualified Length of time on the ward Seniority
Noticing	Subtle changes Dramatic changes Actions taken
Organising	Routine How patients were allocated Planning
Taking Action	Actions taken Actions not taken
Delays	What delays When there were delays

The dimensions emerged through the differentiation process and analytical questioning of the data. I did this by developing tables in Word™ with the name of the dimension, its properties and interview data supporting the dimension. Analytical and theoretical memos and questions were recorded here with sampling decisions and further interview questions. Figure 4.5 gives an example.

Figure 4.5 A Section of the Analysis of the Dimension 'Out of Hours Hospital'

Dimension – Out of Hours Hospital

Hypothesis

Being in the hospital out of hours is a factor that adversely affects the way sick patients are cared for

Analytical/Theoretical Memos

Links to values and beliefs dimension.

Links to not being heard dimension.

There is a sense from the participants that they make do. They almost expect the difficulties, wish for a better system yet appreciate the resources they do have. Less support.

Opportunist care prevails There is a sense of being lucky if it works out smoothly.

Some participants described resources but others felt short of help.

Patient need is central in this dimension.

Actions in an emergency didn't particularly change, except less steps to take so less drip feeding to team members, more of a move to call for help directly to doctors and outreach.

Handover seemed key to participants with this.

Of interest – out of hours is in fact most of the time.

Question - How does this data link to the above mentioned dimensions?

Method

All data pertaining to out of hours care was copied and pasted into this table. Four properties relating to the dimension are depicted in the columns with data to support or in some cases refute the heading chosen.

These were then aligned with a participant to search for patterns in behaviour and process and linkages across other dimensions.

Properties of the Dimension

	Not knowing the patient	Resources available	Enhancing care	Delaying or adverse effect on care
P1	L87 . So basically he'd know all about the Mr P ones, but not so much about Mr S, Mr B, we've got urology, we've got orthopaedic. They don't review the orthopaedics at all, or the medical.	L90 But I mean, if you've got anybody that you feel is really generally unwell we have outreach that are on call [but not out of hours].		L121 Because they are very busy in Theatres today, they'll only see the problematic patients
	L123 Unless we've, we're really worried, about that specific patient we won't {call a dr}. We'll just say no they're fine. But that is down to whose ever in charge to make sure that they do know that patient.	L284 the problem they've got of a night, which I totally sympathise with them, they only have 2 trained and 1 HCA, and it is not enough staff, not on an acute surgical ward.		
		L362 No it's just a bit hard when you are in charge and you've got your own allocated patients. Weekends, it does work well with 3 and 3, but to me you still need a coordinator.		
P8		L142 , I think night time, I mean in general night time you've got less nurses around you've got less doctors around. You haven't got, um, like your outreach team. Our team unfortunately can't do 24-hour cover. So you haven't	L242 they now work for our site team so that if they're on, say of a weekend or of a night time when you haven't got an	L193 And to get a decision, because that was what was slow this morning, the weekend team and early hours of this morning, um, the Anaesthetic team had

	Not knowing the patient	Resources available	Enhancing care	Delaying or adverse effect on care
		got S our respiratory nurse, we utilise her an awful lot.	outreach you still know you've got someone who understands.	said "We'll get the day staff to come and review", and obviously this was just gone 12 o'clock, um, that PAR scored at 7

This was my first attempt at using dimensional analysis and reflects the neophyte nature of me as a novice researcher using dimensional analysis looking for “*what all is involved here*” (Schatzman 1991). The dimensions and properties at this stage are therefore very simplistic and descriptive. It was at this stage that I met with my supervisors who encouraged me to ask different questions of the data, to expand my ideas creatively and encouraged me to see the data as strange rather than through the eyes of a critical care nurse. This encouraged me to attend to my reflexivity as I entered the field a second time.

4.7.2 Data Analysis Phase 2 – Further Dimensions and Differentiation

The second phase of data collection was undertaken on a medical ward. I was looking for a range of nurses with different levels of experience, and at different stages in their career to investigate whether their decision-making differed according to these criteria. This enabled me to make comparisons across cases and further interrogate the dimensions and data. This led to additional dimensionalising and differentiation. This in turn guided participant sampling and data collection choices. Such decisions might include time of day, day of the week and so on. It was at this stage I interviewed 2 participants from the physiotherapy profession. Their insights were sought in order to illuminate the phenomenon from their perspective. They were theoretically sampled as they received referrals from nurses to assess deteriorating patients. I was interested in gathering data about these referrals and their perception to explain the theoretical insights gathered thus far from the nurses.

I also turned to the literature at this stage. Certain concepts seemed to stand proud from the others. An example of this was the notion that participants appeared to have the need to feel like they were in control. This focused my attention on what happens when someone feels in control, or when they don't. Using search engines such as www.google.com, google images, www.dictionary.com, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the University search engines I uncovered information about

'locus of control' as a theoretical concept. I then assigned this as a dimension including the pertinent sociological theories among its properties. Existing dimensions and properties seem to mesh with this concept.

The website www.dictionary.com was very helpful, acting as a conceptual lever in enabling me to view the data as strange and to examine it from opposite perspectives. A similar search of websites and the literature was undertaken that produced the dimensions *'values and beliefs'*, *'authentication'*, *'positioning theory'*, *'professional self-confidence'*, and *'emotional competence'*. The remainder emerged as data analysis and data collection continued. Strauss & Corbin (1990, 1998) caution against the pitfall of selecting data that has been established by another theory. They suggest this may hinder the generation of fresh categories and theories. I was very mindful that theory can be forced. Acknowledging this concern, I progressed with the aim of using the theoretical insights of other authors to sensitise me to potential patterns in the data (Lempert 2007). I sought a delicate balance between using pre-existing theoretical and disciplinary knowledge whilst also remaining reflexive and therefore unaffected by the existing theories and literature I was reviewing. This seemed a pragmatic approach, alerting me to gaps in my theorising which would culminate in a more nuanced story, whilst not preventing theory being generated from my own collected data (Lempert 2007).

These dimensions were plotted on a Word™ document in tabular form recording the current working hypothesis. This provided an audit trail of the analysis and emerging insights and ordered the vast amounts of collected data. The analytical memo section contained my thoughts as I compared across dimensions, and as I considered the transcripts and concepts. I recorded theoretical sampling decisions in this section including requirements to search the literature, or noting to myself to compare and contrast against other dimensions. The next section of the matrix contains the evidence supporting or refuting my thoughts. At the end were actions for further consideration. Although sometimes this iterative process felt 'messy' due to its constant ebb and flow, the matrix format ordered my thinking as time

progressed. This was an iterative process that took many months. An example of the tabular analysis can be found in Figure 4.6.

Some of the dimensions took on a new salience when examined from different perspectives or as more data evidence emerged. For example the dimension '*building a case*' began as a property of the '*being believable*' dimension. As data collection progressed I decided to look at the data from the perspective of that property and found this to have enough relevance to warrant designation as a dimension in its own right. Later it was trialed as a central perspective. This '*trying it out*' was pivotal to the abductive process and led to mutations for several of the concepts as analysis continued (Bowers and Schatzman 2009). Transcript analysis of the transcripts refined and expanded previously developed dimensions. In addition, ideas that came to mind through supervision sessions, action learning sets and time on my own or conferring with a fellow doctorate student, enabled me to think creatively and conceptually. As this process of conflation and differentiation continued the 23 previous dimensions became nine. These are shown in Table 4.7

Table 4.7 Dimensions and Properties Post Phase Two of Data Collection

Dimension	Properties
Values and Beliefs	Caring ideals – beliefs about how caring should be Caring options – availability and suitability of resources and services Caring proximity – relational, geographical, cultural closeness or distance Caring rewards - positive aspects
Working in a Crisis	Mechanistic, emotionally engaged, rabbit in headlights, stop seeing, focused, crescendo
Being believable	Watchful waiting, checking interventions, building the case, confidence in findings
Out of Hours Hospital	Not knowing the patient, resources available, enhancing care, delaying or adverse effect on care
Authentication	Needing to check with others
Locus of Control	Internal locus, external locus
Positioning Theory	Placing themselves in their perceived professional and hierarchical position
Professional Self-	Optimism and confidence in attitudes and judgements

Dimension	Properties
Confidence	Pessimism, low self-satisfaction and sense of worthlessness Fluctuations in self- confidence
Emotional Competence	Zero level – where a person’s helping is always contaminated by their distress Compulsive intrusive helping – most prevalent in our society Slips can occur but person knows it and can correct it.

The critical mass of dimensions had now been collected. The next step I undertook was ordering these dimensions into explanatory matrices using a design that provided a logical sequence of steps (Scholes 2010). The conceptual components used were:

- Context – the environment or situation in which the dimensions were embedded
- Conditions – the dimensions and properties that shape, facilitate, block or affect the actions and interactions in play
- Processes – the intended and unintended actions and processes that were taking place
- Consequences – the outcomes of the actions placed in the ‘processes’ section
- Theoretical explanation – an attempt to theoretically explain the phenomenon at an abstract and conceptual level which was then compared and contrasted with the literature to develop or refute the theory.

A sample of the matrix used to explain the dimension ‘*Out of Hours Hospital*’ is shown below. The example shows how the data was ordered and how the theoretical explanation and analysis was recorded. This process occurred with all dimensions and their properties in order to finally illuminate the central organising perspective. Some dimensions became properties of others until the dimension with the greatest explanatory power was illuminated.

Figure 4.6 Illustration of an Explanatory Matrix – Out of Hours Hospital to show development of the Central Organising Perspective

Context

Concern about a patient on a:

Saturday

Sunday

Evening

Night time

Conditions

No outreach team

No specialist nurses

Regular medical team may or may not be on duty

Teams may not know the patient

Less people around to help

Less staff on the ward

Process/Actions

Call available team to review

Handover occurs 24 hrs a day

Place emergency call to get help

Consequence

Patients not known by teams

Less reviews take place

Have to 'make do'

Calls not answered

Delays in reviews

Drug doses missed or late

Anxiety increased

Theoretical Explanation

Delays in seeking help for deteriorating patients outside of normal hospital operating hours can occur because there are less resources around and people are unfamiliar with the patient.

This creates a level of anxiety for nurses and means they sometimes jump steps to get help – evidenced by calling 2222 without going through 'watchful waiting', 'authentication' or checking interventions as they did during normal hours prior to calling for help.

Having undertaken two phases of data collection and developed a number of matrices, I began trying out different explanations of the data. I drafted a '*story of the case*' using these matrices. This process enabled me, through the writing, to identify patterns and linkages across dimensions.

4.7.3 Data Analysis Phase 3 – Integration and Reintegration

The final operation of dimensional analysis is integration and reintegration developing explanations of the dimensions around the central organising phenomenon before writing the theory (Scholes 2010). The central organising phenomenon should pull together all the other dimensions to form an explanatory whole (Kools et al 1996). The wealth of available data made the task of determining a central overarching perspective challenging. This was achieved through constant editing and rewriting, for example through the mechanism of the '*story of the case*', and depicting my thinking with the aid of diagrams.

The overarching perspective that best explained what was transpiring in the setting was that the nurses were building their case, convincing themselves of the case's ability in order to convince others so as to elicit actions and decisions which would address the deteriorating condition of the patient. It was as though they were needing to account for their thinking and decisions. When I assigned each of the explanatory matrices as the central perspective and linked the others in, it became apparent that building their convincing case was the thread that bound all other dimensions and presented as the overwhelming '*raison d'être*' behind the decision-making processes.

Through further writing, reflection, reading of the literature and discussion with supervisors, a central dimension was identified that enabled other dimensions to fit into a coherent explanatory matrix (Figure 5.1 in chapter 5, section 5.1.1 – The Decision-Making Model

That Occurs When a Patient's Condition Deteriorates). From this, it was possible to slot other dimensions into place. The writing up of this explanatory matrix formed the foundation of the substantive theory. It appeared at this stage that as nurses were attempting to make sense of the clinical scenario, they tried to 'account' for what they sensed through searching for confirmation of their suspicions. This theory was tested out at two national critical care conferences⁹. Feedback was positive with delegates expressing resonance with the findings presented. This suggested it had some credibility. The creative journey of writing this thesis provided a final opportunity to reflect on and refine the theory which is presented in the next chapter.

4.8 Summary

This chapter has described how I developed my methodological decisions through the phases of data collection and data analysis. Differentiation of these dimensions developed an explanatory matrix during the third phase of data collection and analysis. The final stage of the research process was the integration of the matrix and its development into a substantive theory. By detailing these processes I have offered an audit trail that assures rigour, credibility, dependability and confirmability. The next chapter presents the substantive theory supported by the interview data.

⁹ Smith SA (2011) *Decision-Making in Acute Care Nursing with Acutely Unwell Patients*. Presented at the South Thames Intensive Care Managers' Group (STICUMUP) Conference - Fighting for Better Patient Care, 14th October 2011, Aurora Hotel, Crawley, Surrey.

Smith SA (2012) *The Theory of Mind Accounting: Decision-Making in Acute Care Nursing with Acutely Unwell Patients*. Presented at the British Association of Critical Care Nurses (BACCN) - 4th International Conference, 10th September 2012, Brighton Dome, Brighton, Sussex

Chapter 5 – Findings

5.1 Introduction

The findings of this study are set out as a substantive theory built from analysis of the data. The chapter is organised into the following themes:

- The ward routine – clinical reasoning and decision making on a normal day
- Crescendo of care – clinical reasoning and decision making when the clinical picture is uncertain (escalation)
- Management of crisis – clinical reasoning and decision making in extreme circumstances
- Values and beliefs – their influence on each of the three decision making modes
- The theory of mind accounting in clinical reasoning – the central organising perspective conceptualised from the 'building the case' dimension.

These themes, with their related dimensions and properties, disclose the social interactions and processes in play around the deteriorating patient. They build a story of the case from which emerges the substantial theory of mind accounting in clinical reasoning. This central phenomenon provides the most fruitful explanation to account for the factors that influence clinical decision-making when caring for deteriorating patient in the ward environment. In presenting and discussing the theory the literature has been used as a comparator to the emergent findings in this chapter and chapter 6.

Importantly, clinical reasoning and decision-making are made conceptually distinct. The point at which a decision is made is influenced by the clinical reasoning patterns that materialised when the participants explained their actions, thoughts and interactions, thus decision-making

is conceptualised as the end point after a period of clinical reasoning. Clinical reasoning is conceptualised as the process undertaken leading to the decision making point. The analysis of the interview data aimed to answer the following research questions:

1. What are the contextual factors that impact the recognition of and response to the deterioration of the unwell ward patient?
2. What influences decision-making when caring for such a patient?
3. Which contextual factors promote good quality care (defined as timely intervention) for these patients?

Each theme is presented and supported by quotations from the interview data. Where more than one participant expressed a similar view, a typical exemplar is given. Finally the substantive theory of mind accounting in clinical reasoning is explained.

5.1.1 The Decision-Making Model

The clinical reasoning patterns used by the nurses in this study were cyclical and diverse. Nurses did not appear to follow a linear and uniform scheme of clinical reasoning as originally described in the seminal works by Elstein et al (1978) and Carnevali et al (1984). Instead, they were influenced by a range of contextual factors that affected their decision point, decision-making processes and subsequent actions. Factors such as knowing the patient, the handover process, how patients were allocated, the length of time the nurse had been working on the ward and the speciality and experience of the nurse were influential but they did not explain the clinical reasoning patterns that emerged.

The decision-making processes could be attributed largely to the different perspectives the nurses held about a situation; this altered their reasoning and actions (figure 5.1). The nurse's values and beliefs underpinned their subsequent course of action. Ultimately, these

factors appeared to condition how and when they made the decision to escalate their concerns. The whole process was encompassed by constant 'cognitive justification' of their reasoning and actions later conceptualised as mind accounting in clinical reasoning (section 5.6).

Nurses who participated in the study have three stages in which they orientate their clinical decisions. They are:

- i. 'ward routine – customary reasoning',
- ii. 'crescendo of care – abductive reasoning' and
- iii. 'management of crisis – confirmation reasoning'.

These stages influence how nurses interpret the clinical picture unfolding before them and build a case they feel is convincing enough to make a referral and thus escalate any additional treatment decisions to another professional. They also influence the ways nurses give care.

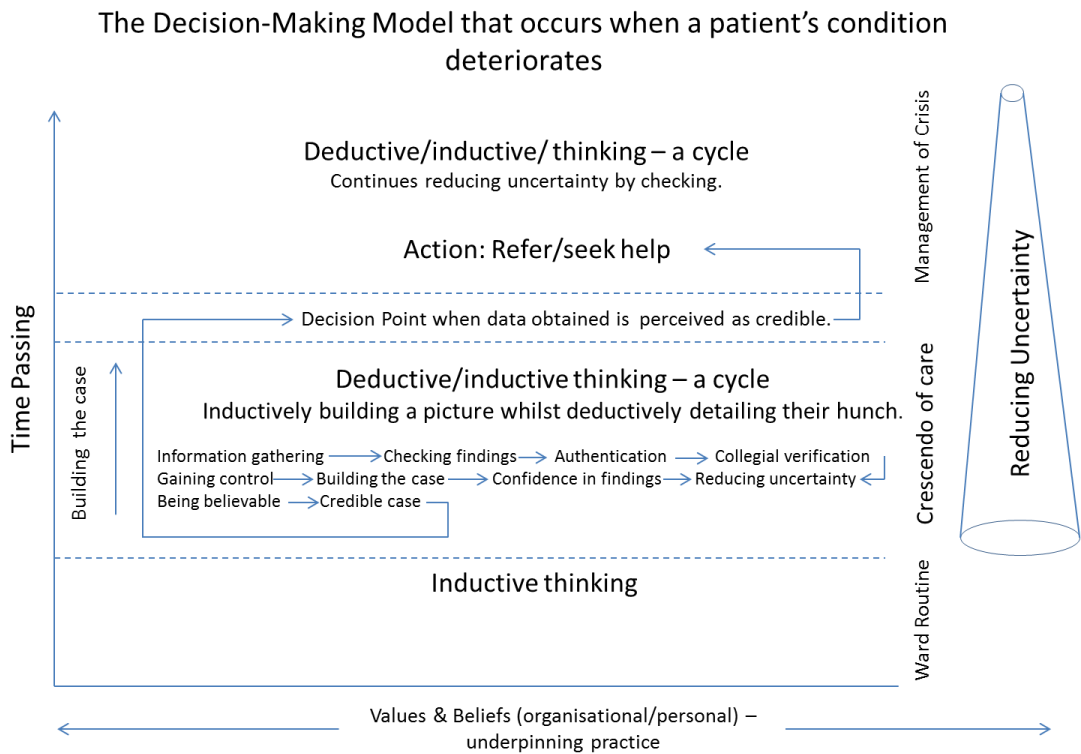
In Figure 5.1 (overleaf) the horizontal lines represent a significant cognitive event and/or decision point for the nurse. The vertical line represents time passing during the span of the shift. This can be any length of time depending on how the patient's condition progresses. Between each horizontal line different processes are taking place within the modes named 'ward routine', 'crescendo of care' and 'management of crisis'. These processes encapsulate the nurse inductively building the case by piecing together segments of information about the patient. The nurse also uses deductive thinking where they take a diagnostic hypothesis and cross check with objective data, in the form of physiological parameters such as blood results. They need to 'account' for their assumed hypothesis prior to taking action.

Abductive reasoning describes the process of logical interpretation before arriving at a diagnostic conclusion or reasoned decision. Throughout the second and third tiers the nurses continue to follow the abductive reasoning cycle. They appear to be doing this for different

reasons. During the crescendo of care phase the nurse is concentrating on building a credible case.

In management of crisis, the nurse is trying to reduce uncertainty and seek confirmatory evidence. Underpinning these processes are the nurses' values and beliefs. The interview data is expounded through a combination of perspectives, dimensions and concepts. Each stage in the decision-making model is explained in the following sections.

Figure 5.1 The Decision-Making Model That Occurs When a Patient's Condition Deteriorates



5.2 The Ward Routine Mode – Customary Reasoning

When a nurse surveyed the clinical situation during the normal working pattern of the ward, decision-making was characterised with planned routines, cultural norms, established protocols, policies and procedures. These activities formed the routine 'surveillance' of the patients, and are based on standards set out in policy documents (NCEPOD 2005, NICE 2007) developed to ensure adequate observation and intervention of patients at risk of deterioration in general ward settings. Decisions

framed by these circumstances have been called customary reasoning. Customary reasoning was evident in:

- i. handover at the start and the end of a shift to determine patient allocation
- ii. routine activities such as the regular medical ward rounds,
- iii. the attendance of specialist staff, such as the Respiratory Clinical Nurse Specialist,
- iv. the attendance of therapy staff for example physiotherapists, who contributed to planning for the ward patients.

Decision-making was reliant on routine and protocol and was seen as part of a 'normal day' by the participants. Data collected regarding this included:

- The timing of vital sign observations
- The use of pre-printed care plans
- The use of Patient at Risk (PAR) Scores (Appendix 1).

All actions were controlled by a protocol and did not require the nurse to consider their response, unless something untoward was discovered which might warrant a departure from the routine. The way in which the 'routine' influenced the nurses' response was described as:

"A lot of it truly is on routine. A lot of the time it is down to the observations, it is down to the PAR score".
(Participant 15, Band 7 Charge Nurse).

"The PAR score is always very helpful....This patient is scoring 4, so I will do observations every 15 minutes and see if there is any improvement. If not after another 15 minutes, then I will get an expert opinion such as the critical care outreach team. Of course I will inform the [medical] team as well at the same time I call the outreach team".
(Participant 4, Band 5 Staff Nurse).

“I do like it [pre-printed care plan] because on this ward we have got patients with the same problems, like stoma care, oxygen care, post-op care....That is our routine, the post op care plan for the hospital, 15 minutes for 2 hours, if unstable go on with 15 minutes or change it after 2 hours. Put it on 30 minutes, for the next 2 hours as well, once he’s stable we can do hourly. But if the blood pressure is low, if I’m worried it is too high or too low I won’t change it in the two hours I will leave it on the 15 minutes, probably for 3, 4 hours. It’s good because you won’t miss anything”.
(Participant 5, band 5 Staff Nurse)

The nurses combined physiological data, test results, and decisions agreed by the visiting professionals on routine reviews, to direct their thinking. They collected this information as part of standard care. Some referrals were routinely generated. A physiotherapist explains their typical practice in the ward with sick patients:

“If it’s a patient, for instance, like the chap that’s on NIV¹⁰.... because he has got an exacerbation of COPD [chronic obstructive pulmonary disease] we would automatically pick him up anyway, or anyone who’s got a chest infection.”
(Participant 11, Physiotherapist)

These patients were automatically reviewed by some specialist teams, usually only during normal working hours. The impact of this on the nurses is explored later.

Customary reasoning was present even when a patient’s condition altered, as long as it fell within the parameters of established protocol, as highlighted by participant 5 above. There were clear escalation procedures for the participants to follow, which they usually did when practising in this mode. Interestingly, the above participant chose to adhere to the post-operative care plan, albeit more cautiously with more frequent vital sign intervals monitoring, but did not mention the PAR score protocol which may have suggested a different course of action in

¹⁰ NIV is non-invasive ventilation, a modality of respiratory support for patients in respiratory failure that is delivered at the bedside by a portable respirator via a specialised oxygen mask.

the case of a persistent low or higher than expected blood pressure. This action was not evident in other participants' interviews.

When working in the mode 'ward routine', participants positioned themselves according to their perceived professional roles and did not deviate from this within the hierarchy of the ward. An example is that the health care assistant always made referrals to a registered nurse. It was usual practice for the nurses to follow the hierarchical norms and the protocols in place step by step irrespective of the acuity of the patient. The healthcare assistants always informed the registered nurse, the registered nurse would then inform the doctor. The following participants describe their decisions to refer a patient:

“Well I just noticed during the afternoon that she was drinking quite a lot. At about 5 o'clock I said to the Staff Nurse 'shall I do a random BM stick?' I thought she was drinking and we needed to check it, which I did, and it came back at 19.0 [mmols/l]. So, I informed the Staff Nurse who then waited an hour and a half. About half past 6 I did another one... so, I informed the Staff Nurse. We informed the doctor who then decided that we should do a fasting glucose overnight.”
(Participant 2, Health Care Assistant)

“The health care assistants usually tell me when there is something wrong with the obs [vital sign observations]. PAR scoring I think is great because obviously you know when things aren't right obs wise. Obviously if someone's got a high respiratory rate I'm worried, if somebody's tachy [tachycardic – fast pulse rate] I'm worried, but with the PAR score is, they say to you 'if someone is PAR-ing 6 call me or Medical Emergency.' And that's what we are told to do so no one can have a go at you. Even if they try we say it's protocol. Stops a lot, it has worked, it's stopped a lot of cardiac arrests, they get there quicker, they have to come up in 15 minutes. And someone's PAR-ing 6 up they come, and a decision's made.”
(Participant 13, Band 5 Staff Nurse)

The participants tended not to deviate from their perceived professional roles and position within the hierarchy of the team. A charge nurse explained:

“People do not move out of their position in the hierarchy... There is a hierarchy and on days [shifts] I see it. I have people that are on nights and at night are totally confident. They will deal with any issue that arises. Put them on the day shift and because somebody senior is around they won’t deal with it in the same way. I agree that professional boundaries influence people.”

(Participant 15, Band 7 Charge Nurse)

The nurses seemed to assume a role influenced by their perceived professional boundaries and how they envisioned themselves within these self-imposed constraints. Even in an emergency, participants appeared to remain in their perceived role for as long as they felt sure of their position in the team, in this case junior and subservient.

“I’ve been at a couple of respiratory arrests. I have been asked to assist with things I haven’t done before, but I have been comfortable because there is a team around you. In that situation everybody knows their role.

I situate myself where it’s needed, I don’t feel I was a junior member of the team but was there to do whatever was needed.”

(Participant 23, Band 5 Staff Nurse)

This nurse was operating within the boundaries of ward routine and customary reasoning by actively situating herself where she felt most competent. Nurses who viewed the shift as a normal day did not expect an unexpected event to occur. The mode ‘ward routine’ represented the ‘background music’ of day to day life on the ward. It was always there and remained even when a patient’s condition altered. The participant, who had noticed a change in the condition of one of their patients, adjusted their actions. This trigger is represented by the first dotted line on Figure 5.1 and marks a change of pace and thinking. Participants described this trigger point:

“On Thursday when I came for my shift, I noticed that she was very sick. It seems that she had fallen very ill on Wednesday....her urine output was very good, still I said that she needs a blood test to see what her albumin level is, plus she was getting pale so I thought let us have a look at her haemoglobin.”

(Participant 4, Band 5 Staff Nurse)

“I think sometimes the junior ones [nurses], they will come to you [for help], they say ‘well there is something not right but I don’t know exactly what it is.’ You know that some patients look different. They say they don’t look as well today”.

(Participant 8, Band 6 Junior Ward Sister)

Both participants described knowing something had changed with the patient’s condition. In these examples this was a hunch, inductively derived. They had noticed a difference. This was the point where the nurse moved from routine, protocol based thinking to more liberated thinking. They focused on the patient, analysing the information they had collected. Their inductive thinking at this trigger point moved the tempo of care into its next phase, illustrated on Figure 5.1.

5.3 Crescendo of Care – Abductive Reasoning

The second mode of reasoning nurses demonstrated was ‘crescendo of care’. This phase began after the nurses noticed something was wrong with the patient. The crescendo of care mode was a disquieting time, which nurses found very challenging. Some of the characteristics of this phase were:

- i. the pace of care became faster and more intense
- ii. it was marked by uncertainty
- iii. there was risk to both the patient and the nurse.

Risk to the patient included mortality and morbidity and risk to the nurse was causing harm to the patient, either by acts of omission or commission in trying to right the situation. Nurses feared they were at

risk by being unable to account for their action or inaction if the clinical situation overwhelmed them. This trepidation initiated a compelling need to reverse the unfolding events. They attempted to reduce their level of uncertainty by obtaining patient data to furnish the attending professional with credible evidence of their concerns. The pace of care quickened, attention intensified and action sharpened whilst this data was being obtained. There were a number of aspects to this problem-solving, detective part of the process. It involved a cyclical application of inductive, deductive and abductive reasoning. The nurse inductively built the picture whilst deductively detailing their hunch before reaching an overarching conclusion as to what might be wrong with the patient, an 'accounting' or justification of their thinking. The outcome of that decision could be a referral on to another health care professional for action, known as the escalation of care.

The elements of the crescendo of care are:

- i. Information gathering
- ii. Authentication and collegial verification
- iii. Gaining control
- iv. Being believable.

5.3.1 Information Gathering

At the 'crescendo of care' trigger point the nurse sensed a pattern change from the 'norm' for the patient in three distinct areas:

- i. The patient's character and physiological response
- ii. The nurse's own professional knowledge perspective
- iii. Protocol and procedure.

However, they did not always fully understand the cause of the problem. One staff nurse described this feeling:

“From the first lot of surgery she just seemed to take a long time to start and she wasn’t doing and her output from her stoma wasn’t great so you knew something wasn’t quite right there. We were trying to get her out of bed, she didn’t want to know. Not her”.

(Participant 3, Band 5 Staff Nurse)

“She’s really sort of gone down and she is worse today than she was 2 days ago definitely. She looks different.”

(Participant 7, Band 5 Staff Nurse)

Nurses frequently described experiencing feelings of concern in the face of little empirical evidence of deterioration. They noticed changes in the patient but were unable to articulate what these were. Sometimes there was an increase in the PAR score, obtained as part of routine care; often there were subtle changes in the patient’s condition or character.

“When you have hunches about a patient....There have been patients before that have been fine, they have been cardiovascularly perfectly stable, and you know there is something wrong, but you don’t know why there is something wrong. You may have subtle symptoms, they might be pale, they might just become less communicative”.

(Participant 14, Band 6 Junior Charge Nurse)

The nurses were comparing the most recent available information about the patient with previous data and acknowledging there had been a change that disturbed them. This concern triggered further information gathering, and a deductive search for supporting evidence. This might comprise increasing the frequency of vital sign observations, ordering blood tests or undertaking an electrocardiogram (ECG).

“Nine times out of ten the obs [vital sign observations] are alright, but it’s actually something about the patient that is not right so we’ll up the ante, we’ll do the obs a little bit more frequently, we’ll make sure we walk past that patient a little bit more than what we would have done. Because you just know”.

(Participant 15, Band 7 Charge Nurse)

These vigilant actions formed the dimension 'watchful waiting', described earlier where the participant collected more data whilst watching and waiting to see how the patient progressed. These data also enabled them to build their case towards the point when a decision to refer was made. During 'crescendo of care' the patient was prioritised. The gathering of information contributed to building a credible story which was used to convince another professional that the nurse's concerns were legitimate.

During the 'crescendo of care' nurses undertook practical actions to prioritise patient care and to ease their own anxiety. They moved the patient closer to the staff base: believing that if the patient was in close proximity they would be safer because it allowed for closer monitoring. Closer monitoring allowed them to search for evidence to support their clinical impression. One staff nurse described her reasoning:

"You just worry that there are times you don't go to the patient's bedside very often. You can't notice, so we put them in the bay near the nurses' station where we usually put people back from ITU. You can just look at a patient while you are standing at the nurses' station. Makes us less worried."

(Participant 5, Band 5 Staff Nurse)

Nurses were driven by the belief that the patient was at risk of harm, and they were at risk of being out of their depth and unable to avert that harm. They sought assistance to either authenticate their hunches or to seek collegial verification for their concerns.

5.3.2 Authentication and Collegial Verification

The nurses initially involved other professionals to check their thinking rather than to seek help. These dimensions were labelled 'authentication' and 'collegial verification'. Authentication of the data occurred when participants were trying to establish whether their interpretation was a genuine and accurate portrayal of the unfolding

clinical picture. They also used authentication to establish whether their concerns warranted expressing their clinical opinion to more senior staff in order to elicit help: they needed to have 'grounds' to do this. Conceptually this relates to the participants needing to be convinced of the validity of their hunches which were based on data such as the patient's observations. Participant 4 explains her thoughts when discussing patients she was caring for:

"I always like to ask the outreach team what is the difference there so we can compare and see. If there is a situation I always go and discuss it with the Ward Sister like M, to explain the patient's condition is worsening."

Authentication was seen as a way of seeking reassurance because participants inductively knew that the patient was unwell. Sometimes participants used authentication to build their case in the crescendo to justify their decisions, to alleviate anxiety and convince themselves they were taking the right actions for the patients.

"I always work collaboratively with my colleagues. If someone is very unwell I always discuss it with my other trained colleagues even the junior nurses because sometimes they've got some recent development or experience or they just think of something that I've overlooked".

(Participant 14, Band 6 Junior Charge Nurse)

Many participants described using 'collegial verification' where they attempted to share collectively the responsibility of this concern with members of the team on duty to check out hunches prior to seeking specialist help. Some of this was related to protocol but was often seen when nurses felt out of their depth.

"[I ask] am I in the right part, or do we have to take some other actions? Maybe she will have a better idea for me."

(Participant 4, Band 5 Staff Nurse)

"If I've got a concern and there's nobody on the ward who believes you – generally nurses do believe you. If you talk to

another nurse even if it's only a gut instinct another nurse will say to you 'I understand what you're saying, I think you're right'. That gives you more confidence".
(Participant 15, Band 7 Charge Nurse)

This shared the risk posed by the clinical situation and enabled the participants to reduce the uncertainty they felt. It was a strategy developed so they could feel more in control:

"I wanted a blood gas done on him and obviously I knew we needed to increase his oxygen, but I just wanted to run it by someone else senior to cover myself. In case he's a retainer but obviously I know that when somebody's sats [oxygen saturations] really drop it's at the time the oxygen is more important you do it, but you just try and keep an eye and don't do it too long. I just wanted to let her know. Cover myself."
(Participant 13, Band 5 Staff Nurse)

"I had the PAR score and I kept re-doing the obs. And kept doing them and saying 'now she's PAR-ing 6, she's PAR-ing a 7, she's getting worse. And everyone was just like – 'well... you know what's going to happen'. I thought that's my PIN [professional registration] you're going to risk. So I wasn't happy to do it."
(Participant 22, Band 5 Staff Nurse)

Participants discussed on several occasions how they could avoid professional risk to themselves and their fear of litigation or losing their registration. 'Authentication' and 'collegial verification' offered a veneer of protection. This defensive approach included drip feeding information to others to share responsibility. Two staff nurses explained:

"I wanted him reviewed. The site nurse practitioner is a bit of support as well and also she is very knowledgeable and the one that was on duty that night was part of outreach as well.... I wanted a blood gas done on him and obviously I knew we needed to increase his oxygen, but I just wanted to run it by someone else senior to cover myself....I just wanted to let her know. Cover myself."
(Participant 13, Band 5 Staff Nurse)

“We don’t like to take risks, because of legal issues, legal boundaries. In the end I’ll be answerable if called to account. So in the end you just end up calling the doctor for silly things really. Some of the doctors say ‘why are you calling me for this?’ I say to them ‘just covering myself’. I have to.”
(Participant 5, Band 5 Staff Nurse)

In fact, the risk was actually to the patient not the nurse, with the possibility of delays in timely delivery of care. Comparison across participants revealed that more experienced and senior nurses, those in ward sister and charge nurse roles, escalated their concerns with less apprehension for their own accountability:

“I’ll be assertive. I’d say ‘I’m telling you here on the phone that I am very worried about that patient, and I don’t know what is going on but I think something is seriously wrong’. And if they don’t respond to it I just escalate up. I generally found that registrars take me seriously, the more experienced you are the more serious they take you. I think they know what you mean.”
(Participant 14, Band 6 Junior Charge Nurse)

“The uniform helps. And I think probably I can be a bit more bulshy than perhaps some of them. If I don’t get the answer that I want from the first person then I’ll ring someone more senior to them. And I don’t care. I’m not worried, I would go and get a Consultant. I ring Consultants ‘can you come and see this patient there’s none else available.’ And Dr L our Consultant, he knows that anyway”.
(Participant 8, Band 6 Junior Ward Sister)

Senior staff demonstrated no hesitation in getting help when concerned about a patient, and certainly no concern for their reputation or how they would be perceived by the person receiving the referral. The process of negotiation and bargaining was evident as nurses interacted with doctors so that they could achieve the patient goal they were seeking. They showed confidence in their decision and asserted their clinical concerns until the desired action was forthcoming. However, some junior nurses described a different response from the doctors that contributed to the nurses’ unease and feelings of anxiety:

“I worked on a ward where I knew the doctors on a personal level and they were more inclined to come and review them [patients] for you. When you have a problem with say a medical patient and you are dealing with the medical doctors and you don’t actually know them you get a different response.”

(Participant 17, Band 5 Staff Nurse)

“When you work on the wards for a while you get a rapport with some of the doctors. If you ask them to do a few things and they always have seen there is justification, then they are likely to do it.”

(Participant 20, Band 5 Staff Nurse)

These junior staff felt unable to make a convincing referral to some medical staff which they attributed to the nature of the hierarchical relationship.

5.3.3 Gaining Control

Gaining control of the clinical situation was part of the process of building the picture and detecting the patterns occurring within the framework of ‘crescendo of care’. Feeling out of control of the situation led participants to feel very overwrought.

“I quite often have a crisis of confidence. To be quite honest, you get all tense with very very poorly patients and you do the best that you can....and you wake up at 3 o’clock in the morning thinking, I didn’t do that, or I forgot to hand that over It is just very hard to make sure you are doing all the right things, make sure you’re on top of everything.”

(Participant 24, Band 5 Staff Nurse)

This was also evident with more experienced nurses.

“Sometimes you just get on and say [to colleagues] ‘I’m out of my depth with this one, what do you think?’ It’s nice to get a second opinion. I don’t like that feeling because that feels slightly out of control. It’s very hard. I try and manage the situation as well as possible.

(Participant 14, Band 6 Junior Charge Nurse)

The theoretical construct 'locus of control' represents the person's perceived control over his or her own behaviour. This was a dimension that emerged from the data and was explored for its salience in explaining the phenomenon. The classification internal locus indicates that the person feels in control of events; external locus indicates that others or external factors hold that control. Staff nurses oscillated between the internal and external locus of control, depending on the situation. This was in the context of constructing a convincing referral.

Participants in external locus demonstrated a sense of urgency, a type of 'staccato' thinking. This was manifested in feelings of impending doom, high anxiety, a sense of powerlessness and being overwhelmed. These feelings generated greater uncertainty in their reasoning ability. This in turn led to the desire to confirm or refute their tentative impressions and delays in the referral and subsequent treatment of underlying and potentially life-threatening patient issues. The nurses' focus was on gaining control of the situation.

"I started thinking God I'd be going out of my mind if that was one of my family. I could sort of think that people are just faffing around, and not getting on with things."
(Participant 14, Band 6 Junior Charge Nurse)

"I knew something was going to go wrong here. It's going to go completely pear shaped, I've only got to have a cardiac arrest on this ward and we cannot cope. We can only do what we are doing for all of these patients. I was going round and round in circles looking after 7 people because there is nobody else on this ward who can do it; something is going to go wrong. The trachy [tracheostomy] is going to block by the time I get to it. I felt fearful. I felt very afraid for the patients that I was not getting round to and also for myself because actually all of this is resting on me at the moment. What if I get it wrong?"
(Participant 15, Band 7 Charge Nurse)

Nurses vacillated between checking out their hunches, gathering more information and attempting to gain control over the situation. They focused on the patient they were concerned about.

“Obviously you keep a close eye. You just kind of focus at the time. You just kind of stay focused. The only problem I had on my night shift was bed 6. I came on duty; his blood pressure’s been running low since he’d been in. It was even lower and his sats [oxygen saturations] were low, on 2 litres of oxygen, and he’s COPD. I was a bit concerned, as soon as I came on duty I called the bleep holder up and the SHO [Senior House Officer – junior doctor].”

(Participant 13, Band 5 Staff Nurse)

“The previous day we did her observations 6 hourly, and they were normal, but I noticed that she was a bit worse so I did them 2 hourly. I did them every 2 hours to see if there was any deterioration.” (Participant 4, Band 5 Staff Nurse)

“But if the blood pressure is low, if I’m worried it is too high or too low I won’t change it in the two hours I will leave it on the 15 minutes.” (Participant 5, Band 5 Staff Nurse)

As patient information was collated by the participants, their confidence in the findings grew. They believed that the picture was becoming more discernible. They were able to account for their thinking and actions. The pattern of logic these nurses created involved checking out their hunches by gathering further data. The following participants described their actions and thinking during this process.

“If someone says I am not well, I’ll check my fluid balance chart, is he passing urine? What’s the input, what’s the output? What’s the blood pressure? Pain. In what way do you not feel well? Then I check the bloods. I go to the printer and check the blood results. What’s the Hb [haemoglobin], if the Hb is low, someone needs iron and all that – I do the blood results as well. Then you call the doctor at the end. I try and do as much basics as I can do”.

(Participant 5, Band 5 Staff Nurse)

This nurse is using deductive reasoning to affirm her concerns about the patient. The participant below is using the additional data to enhance her credibility prior to referring on. She feels she has to be confident in her findings in order to be believable when contacting the medical team.

“To get the doctors attention and let them know how urgent it is you do need information about the patient’s condition. You do need all the information so you can approach the doctors with all the information you can give. They can then prioritise as urgent. It is quite important to make sure you’ve got everything you can have, to get the doctors there for the right reasons because you want them to take your concerns seriously. Where we have instances like S [Participant 23] had, and we have all had where the doctor has not taken us seriously. It makes you make sure that next time you are really sure. It kind of knocks your confidence, am I making the right decision? I do think as especially as we are newly qualified we are more inclined to say to colleagues do you think I’m right? Is that right? Am I doing that right?”
(Participant 18, Band 5 Staff Nurse)

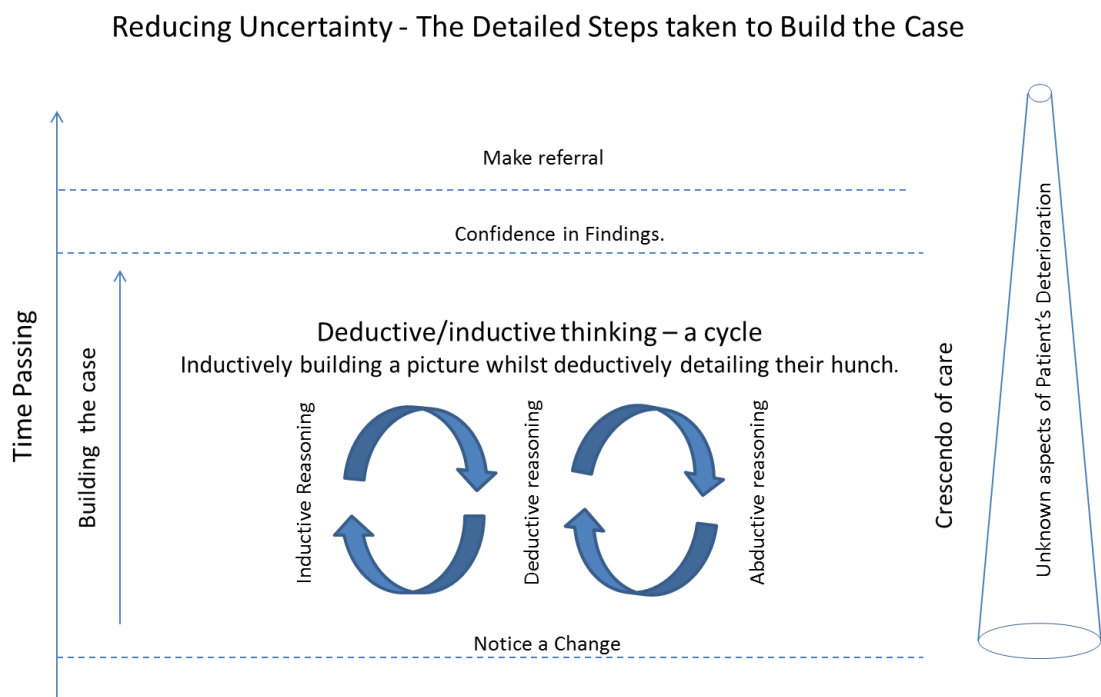
“You just knew she could go just like that. We had the lady on a cardiac monitor so I was checking the whole time.”
(Participant 3, Band 5 Staff Nurse)

This participant was responding to a hunch she had about the patient. She described how she monitored and checked demonstrating her deductive reasoning following her inductively derived concern. Nurses used this deductive and inductive thinking cycle to try to reduce the uncertainty they were feeling about the patients. The nurses eventually arrived at a place where they felt they had a credible case because they had, in their view, gathered enough information and evidence to support their claim, i.e. that the patient warranted additional input from another professional. It was at this point that the decision to refer and seek help was made. Although depicted as a line representing a point in time on Figure 5.1, this could occur at any time point in the process if the nurse believed there was sufficient evidence to make a decision.

Once made, the effectiveness of this referral varied. If they were not taken seriously, or in the manner the nurse expected or needed, it made them then feel as though they were managing a crisis. They expressed feelings of desperation and frustration at not being heard. They continued to work tenaciously on detailing their case, honing the information down into 'sound-bites' to better articulate their concerns to doctors and specialist teams. Figure 5.2 overleaf depicts this process

as a narrowing cone where uncertainty reduces as time passes and the case becomes easier to convey, notably when they have abductively reasoned a diagnosis or case for referral. Once they have confidence in their analysis of the patient's situation and feel they can justify it, they decide to make the referral.

Figure 5.2 Reducing Uncertainty – The Detailed Steps Taken to Build the Case



5.3.4 Being Believable

When nurses were reasoning during ‘crescendo of care’, they expended much of their cognitive ‘energy’ on seeking evidence to support their case to make it believable. This was intrinsic to reducing uncertainty prior to escalating their concerns and also to building a believable case. It was the cornerstone of their efforts and was vitally important to them because if they felt they were not being believed or convincing colleagues adequately, their confidence in their own findings was reduced and their level of uncertainty about the patient then increased.

This affected the way people responded to their concerns and in some cases caused delays for the patient.

“They [junior nurses] keep coming and checking with them [other nurses] rather than with the doctors. Coz sometimes they’re a little bit embarrassed to ask the doctors.”
(Participant 10, Band 5 Staff Nurse)

“If you’re feeling quite confident on top of things, but if things are slipping out of your control and you’ve had your confidence knocked a bit and you’re not entirely sure of the ground you’re on and the doctors you’re with seem more junior, you can then doubt your own abilities and become less effective”.
(Participant 14, Band 6 Junior Charge Nurse)

The nurses had to satisfy certain conditions before seeking help in order to offer a convincing case. This was particularly so in the face of greater uncertainty and more ambiguous patient data. Those conditions included being confident in their assertions and believing that they had enough data to present a convincing argument to the person receiving the referral.

“They’re the hardest ones to justify to the medics [Patients the nurse is worried about but observations and PAR score are normal]. To doctors saying ‘I am just not happy about this’, just your instinct - A tired junior irritated doctor will say – ‘well what about this?’ That’s a shame because then you have to find ways around asserting your view. There have been patients before that have been fine, they have been cardiovascularly perfectly stable, and you know there is something wrong, but you don’t know why there is something wrong. You may have subtle symptoms, they might be pale, they might just become less communicative”.
(Participant 14, Band 6 Junior Charge Nurse)

The nurses hunted for clues to meet the criteria for referral that they believed would elicit prompt action and as such could be considered an effective referral:

“There is not a time where you would not do something first.... You have to do something and then call the doctor.

You won't feel embarrassed if you have done obs, you have done the input and output chart, you have checked their urine output and have done any bloods and know the blood results."

(Participant 5, Band 5 Staff Nurse)

It is important to highlight that the inability of the participant to present a persuasive argument or their actions in trying to improve the argument sometimes caused delays in care. This was particularly evident with ambiguous data. In some cases the patient improved despite the on-going activity. In others, once the doctors had reviewed the patient, it was decided to allow the patient to die peacefully. Others were transferred to the intensive care unit or an emergency call was placed and the patient was very quickly reviewed by the critical care team. When referrals went wrong, or their judgement was flawed increasing the risk of harm to the patient, this contributed to the nurse's feelings of frustration, and in some cases created further anxiety and damaged their professional self-confidence:

"I called the respiratory [nurse] because I was concerned, she wasn't particularly concerned, we got the consultant in who happened to be on the ward. When that got knocked back I then went to another person I went to the outreach because I knew if I called them back they would say but we have already seen [the patient]. I changed from what they recommended [nasal prongs – a device to give low levels of oxygen] because from my point of view that was what was killing the patient. I had to go to someone else really. Rather than wait for them to call back. It was frustrating, it was like 'what do I do'? A second opinion."

(Participant 18, Band 5 Staff Nurse).

In the above scenario the nurse employed differing strategies in order to gain control over the situation. As the situation became more urgent they operated within their established boundaries and sought verification from colleagues while hunting for more persuasive evidence.

Analysis of the dimension 'being believable' led to greater scrutiny of the participants' need to be in control and seek verification of their hunches.

It appeared vital that they had confidence in their findings before they felt able to seek help. The third phase in this decision-making model occurs when a patient's condition deteriorated to the point where the nurses felt in crisis. This had a profound effect on what happened and the way they made decisions. This is explained in the next section.

5.4 Management of Crisis – Confirmation Reasoning

Decision-making in this phase changed pace again, and the nurses began to operate from the perspective of 'managing a crisis'. The nurses were, at this stage, certain of how unwell the patient was, certain of the seriousness of the clinical situation and the need for urgent action. However, some nurses who lacked experience and knowledge, expressed feeling out of their depth when asking for urgent action.

These data indicated that a number of actions were undertaken to manage the perceived crisis. Different tactics were employed to get help. Unlike the 'crescendo of care' phase the participants did not observe 'watchful waiting', 'collegial verification' and 'authentication', but immediately escalated their concerns without validating them with colleagues, notably when they believed they did not have time to build a credible case. They jumped steps to the point of referral in order to speed up response times and actions of colleagues.

5.4.1 Managing a Crisis when needing Urgent Action

Participants described an insistent determination to append more evidence to the case. However, unlike in crescendo of care, this was not to develop a credible case, but to confirm what they already knew to be the seriousness of the situation. Nurses with a 'management of crisis' perspective recognised the need to get help quickly. They understood the requirement to communicate the urgency. One of the staff nurses explained how she did this:

“I saw the signs early...I saw it coming, and then, he’s own heart rate went up, blood pressure plummeted, he had a really high PAR score, and I just got the Medical Emergency team up, twice that day.”

(Participant 13, Band 5 Staff Nurse)

Referring back to Figure 5.2, participants’ clinical reasoning continued to involve deductively seeking evidence to support what they believed was occurring. The additional data acted as confirmation for their previously held hunches. However, the nurses continued to gather confirmatory evidence while seeking assistance for their patient. I have labelled this ‘confirmation reasoning’.

5.4.2 Managing a Crisis with Tenacity

Participants spoke of their difficulties in convincing doctors when they did not have ‘hard data’ or solid evidence to back up their assertions. Participants became very tenacious and employed a range of strategies to persuade when they felt they were not being heard. An experienced charge nurse, who had reached the third tier of the decision-making model, and knew his patient required assistance, describes how he had to assert himself to achieve action for the patient he was worried about:

“Be assertive. ‘I’m telling you here on the phone that I am very worried about that patient, and I don’t know what is going on but I think something is seriously wrong’. And if they don’t respond to it I just escalate up....I think it helps if you provide them with information of what you’ve done. I’ve taken the blood sugar that’s normal I’ve taken the observations they’re normal but this is happening to the patient. I’m worried about this and this they take you more seriously. I think if you’re junior it can sound a bit pathetic to say I’m a bit worried about the patient and I’m not sure why, not communicating very well. So I think you have to give a better quality of assessment.”

(Participant 14, Band 6 Junior Charge Nurse)

Several participants reported resorting to being very combative in order to elicit help for a patient:

“These days I tend to be quite full on. I remember 2 weekends I was on and I had a patient with a systolic blood pressure of 70, and a house officer that was being very very difficult and an SHO that wasn’t answering the phone. I said to the house officer ‘if you don’t come up here I’ll do a clinical incident form about you’. And he came up. He was up in 5 minutes. If the patient’s declining I’m going to get the patient dealt with.”

(Participant 14, Band 6 Junior Charge Nurse)

Others used implicit hierarchy to persuade in these situations:

“He PAR scored 6, but he wasn’t unconscious. And he was with it, and he was talking to me, he was just going off, but, fortunately I had that Reg here. You know if I had had to ring they might not have been so quick to come. They might say I am in A&E, but then again, that’s when this comes in handy [pointing to Sister’s uniform], saying ‘I want you now’. You shouldn’t have to use your uniform, or your status to get someone up quickly really”.

(Participant 6, Band 6 Junior Ward Sister)

Even while the participants were making referrals, they continued to build their case by monitoring and gathering data, even though they might believe that they had sufficient evidence to make a convincing referral, and often had done. They continued to cognitively seek greater understanding of the situation, again attempting to account for what they believed to be occurring. This was more pronounced as a reaction to not receiving the response from the referral that they had wanted or expected. In these situations nurses felt they had no option but to take responsibility and act autonomously.

“At that stage he was, his PAR score was 6. He was an emergency. I fast bleeped the Reg. No reply. And I bleeped the site nurse. No reply. And then I called the 2s. Got the medical emergency up. I didn’t wait around and they’re all like ‘Why did you call us again? He’s not for Resus’. ‘It doesn’t matter it is protocol that we call you, he’s not for Resus but he’s for active treatment’. I was really really worried about him and I was worried when I went home”.

(Participant 13, Band 5 Staff Nurse)

“I didn’t have to ask ‘What was he PAR-ing 6 for?’ because I was told 3 for his heart rate, 3 for his respiratory rate. They were doing hourly obs, monitoring everything, not pyrexial, but just started to get really really tired. I put out a medical emergency because the PAR score went up to 7.”
(Participant 8, Band 6 Junior Ward Sister)

Nurses described being authoritative and bypassing normal procedures or points of referral. These actions were more common ‘out of hours’: in the evenings, night time, weekends and bank holidays. The next section explains these types of referral.

5.4.3 Managing a Crisis Out of Hours

When a nurse had a concern about a patient out of normal hours, the way they called for assistance was different. At these times there were no critical care outreach teams on duty, nor specialist nurses’ support. The host medical team may or may not be on duty, meaning that the teams providing medical cover did not necessarily know the patient. This resulted in a changed temporal-spatial work environment for staff and created different perspectives and priorities, which were a strain to the participants (Allen 1997). This was a pertinent finding given that policy documents recommend 7-day per week and 24-hour per day support for the critically ill ward patients (DH 2000, NCEPOD 2005, RCP 2012). The situation was compounded by the fact there were less people on duty to help and less staff on the ward. Participant 1 (band 6 junior ward sister) described what happens at a weekend with regard to patient reviews:

“So basically he’d know all about the Mr P [consultant] ones, but not so much about the patients belonging to Mr S, Mr B [consultants] who he is covering for. We’ve got urology and we’ve got orthopaedic patients on the ward today. They don’t review the orthopaedics at all, or the medical. Because they are very busy in Theatres today, they’ll only see the problematic patients.”

There was a sense that nurses had to 'make do'. They contended that they had to provide their best in the face of less than optimal circumstances. Nurses' expectations changed out of hours. They anticipated delays so demonstrated short cuts in their thinking and decision-making. There was an expectation that it would be more difficult to make their case so they developed proactive ways of eliciting help. When the nurses perceived that they were managing a crisis they quickly activated the emergency call system. A staff nurse on night duty explained:

"At that stage his PAR score was 6, but they [medical team] were aware of him. He was an emergency. I fast bleeped the Registrar. No reply. And I bleeped the site nurse. No reply. And then I called the 2s. Got the medical emergency [team] up. I didn't wait around"
(Participant 13, Band 5 Staff Nurse)

Sometimes they considered themselves lucky that the person they needed was present on the ward to facilitate a referral.

"He wasn't my patient but I got involved and placed him on a cardiac monitor. Fortunately for me the Reg [Registrar] was here at the time and I said 'Look, can you have a look at this man for me because a) his heart rate is 133, b) his blood pressure is 81 systolic, and his respiratory rate was something like 28 or 30'. So he did actually get to PAR score at 6 at one point. We did get him to ITU quite quickly. Fortunately I had the Reg there and that had a bit of pull, she got the Anaesthetist down, and we transferred him up there. That's how you like it to happen.
(Participant 6, Band 6 Junior Sister)

This led participants to feel that care delivery was opportunistic rather than planned as it was during the week days.

"I had a patient that started PAR-ing a 6 and then I kept ringing the doctor.... not answering. So then when I did call them again the PAR score was a 7. I'd tried to do everything I can. I had to put a medical emergency out. One doctor turned up, then the Reg [Registrar] turned up."
(Participant 18, Band 5 Staff Nurse)

"I started bleeping the doctors at 10 o'clock. I started with the house officer, the house officer couldn't come because they were too busy. Bleeped again at 11 just before the house officer went off duty, there was just something about the patient that I did not feel comfortable with. House officer still refused to come because actually you're not telling me there is anything wrong with this patient. At half past twelve I rang the SHO and the SHO refused to come to the ward. He was busy in A&E so I rang Site [Senior Nurse in charge of the hospital]. Two o'clock in the morning, myself and the consultant, because eventually the consultant came, I rang them, stood at the end of the bed.... I am telling everybody that I know that I am worried about this patient yet I don't think anybody was taking me seriously. And because it was all over the phone, there was nobody actually looking at the patient and seeing what I was seeing."

(Participant 15, Band 7, Charge Nurse)

Participants found these scenarios challenged their personal values and beliefs, magnifying the sense that they were managing a crisis. Delays were evident which they attributed to the reduction in resources out of hours.

"And to get a decision, because that was what was slow this morning, the weekend team and during the early hours of this morning, the Anaesthetic team had said 'We'll get the day staff to come and review', and obviously this was just gone 12 o'clock. That PAR scored at 7."

(Participant 8, Band 6 Junior Ward Sister)

"And if they've got someone phoning up and they've got a PAR score of 5 and they've got this and that, and I'm saying 'Well all their obs are fine but I really don't think they're well', I'm going to be at the bottom of their list. Because we have to be realistic as well because if somebody is really really obviously poorly, they're not going to leave them and come to our patient are they? We'd have to wait, keep a close eye on them keep looking and doing their obs more."

(Participant 10, Band 5 Staff Nurse)

Participants articulated their belief that out of hours equates to a reduction in available resources.

"The problem they've got of a night, which I totally sympathise with them, they only have 2 trained and 1 HCA,

and it is not enough staff, not on an acute surgical ward.”
(Participant 1, Band 6 Junior Ward Sister)

“I think at night time you’ve got less nurses around you’ve got less doctors around. You haven’t got your outreach team. Our team unfortunately can’t do 24-hour cover. So you haven’t got S our respiratory nurse, we utilise her an awful lot.” (Participant 8, Band 6 Junior Ward Sister)

Nurses appeared to resign themselves to a perceived substandard level of support and care during these times. Normal routines did not exist in the same way for 2 days per week and at night – which represents the majority of time. Participants believed that this resulted in a different approach to the sick patient and led to frustration for some of the team. A physiotherapist describes how weekend working caused delays in assessment and care.

“We were sort of saying, why wasn’t the on-call physio called because it would have prevented him getting in to this stage and it’s all very well watching and waiting but he could have been prevented on being this poorly.”
(Participant 12, Senior Physiotherapist).

Limited resources out of hours exposed skill deficits that were able to be addressed and supported during normal working hours. This had an adverse impact on the care of the patient. A junior member of staff described her frustration at not being competent in placing a cannula and the detrimental effect that had on the patient due to her agreed support not being free to attend. She was following the hospital out of hours protocol in getting help to assist the patient.

“I was on a night shift with her, IV [intra-venous] antibiotics due at midnight, cannula tissued, ‘could you put one in for me please?’ ‘Ask the bleep holder.’ Four o’clock it got put in. He missed a dose of antibiotics, and I thought if I could just do it I would do it myself.”
(Participant 13, Band 5 Staff Nurse)

Working in the mode 'managing a crisis' out of hours resulted in less medical reviews taking place, and examples were also given where calls to the teams were not answered.

5.5 Values and Beliefs

The participants' professional and personal values regarding caring, teamwork and their own practice also affected how they constructed their experience of caring for a patient who was deteriorating. It influenced the way they carried out their care and their decision-making choices. Providing high quality care and keeping the patients safe was a guiding tenet for these participants. Participant 3 (band 5 staff nurse) describes what she wanted for a critically ill patient she had struggled to get help for throughout her shift:

"She was such a lovely lady and she was only 61 it was kind of like I just want her to go to ITU so they can sort you out coz I can't do any more than I have done".

"Sometimes you get left with patients that should be elsewhere, serious respiratory conditions for instance, on CPAP¹¹ and they will leave you with that. If I know how to deal with it, I will. It means that you have to leave other patients with less serious conditions temporarily. So you'll have patients on the ward that need attention but don't get it, because you're having to deal for a while with patients with more acute conditions and you find you are battling to get those people cared for. That's when you could do with an extra trained nurse on the ward."

(Participant 14, Band 6 Junior Charge Nurse)

All participants gave examples where they became close to a patient and emotionally engaged. Participants became deeply focused on the deteriorating patient over and above the remaining patients in their care. Participant 2 (health care assistant) describes how she felt more able to

¹¹ CPAP is Continuous Positive Airway Pressure, a modality of respiratory support for patients in respiratory failure.

ask probing questions of a patient after building a relationship with her following a period of critical illness:

“At that point I didn’t know her that well. I probably would ask her now, because I do go and chat to her, I just sort of feel a bit, I don’t know, close to her really. Probably would ask her now, I didn’t like to then as I had only just met her”.

An experienced charge nurse discussed how long-standing relationships with his patients influenced his decision-making:

“Some of my long term respiratory patients I know when they are about to come into hospital because they would have come up a couple of days before or they they’ll phone to see if you’re on duty. And then you’re thinking – you’ll be in in a few days.”

(Participant 15, Band 7 Charge Nurse)

The nurses valued the ethos of teamwork. They anticipated a level of commitment from their colleagues and felt frustrated when they perceived this was not forthcoming.

“All doctors are different. I really like the last set, and these are OK. Some of them are abrupt, some of them are arrogant, some of them do half a job.”

(Participant 13, Band 5 Staff Nurse)

They valued being able to care for patients according to their own standards and fought for this to happen when operating within each of the three modes. This included having enough resource to give what they considered good care. This was evident when working out of hours.

“Sometimes we’re short of staff and it gets so busy with the staff nurses that you just get on with it then, and then you come across one that you cannot manage, you call for help.”

(Participant 9, Health Care Assistant)

“I think it is harder at night because generally you’ve only got your junior staff on duty. There is no band 7 on the ward,

band 6s don't do nights, so it is always the juniors that are there at night.” (Participant 15, Band 7 Charge Nurse)

The culture in all these teams was about helping one another, thoroughness in care delivery and empathy with the patient. In some instances, there was also a desire to protect themselves. The participants very much wanted the best for the patient and worked hard to achieve it. They cared for the welfare of other patients in their caseload that were not a worry to them at that moment. The comment below illustrates the values and beliefs held when working in this dimension.

“Today I have just got those 6 patients and that's lovely because I can be with someone and can hear all the others....Normally, I haven't got that luxury. Half my patients aren't in that bay. So that's a bit more stressful because the trachy patient's not always in my eye or earshot and that stresses me out a bit more because I can't always know they're OK.”

(Participant 10, Band 5 Staff Nurse)

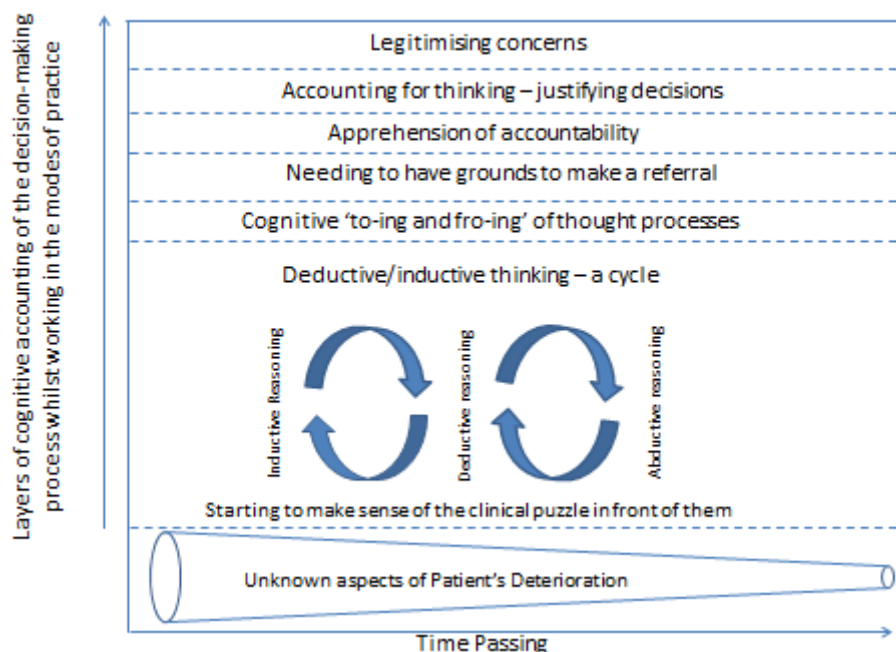
The elementary power of personal values and beliefs is interwoven into many of the comments expressed by participants in this chapter. It is a dimension that represents the expectations the participants have of others. When they articulate a concern about a patient they expect their colleague to reciprocate with a similarly high level of attentiveness and care. Values and beliefs appeared to be the foundation of the nurses' practice and a key motivating aspect in caring for the acutely unwell patient.

5.6 Mind Accounting in Clinical Reasoning

The substantive theory of mind accounting in clinical reasoning emerged from dimensional analysis of the factors that influenced nurses' decision-making when caring for patients whose conditions were deteriorating. The nurses had to 'make sense' of the clinical puzzle unfolding in front of them. They did this by attempting to 'account' for

what they inductively recognised by employing the tool of deductive thinking to confirm their hunches. They searched for evidence to support their clinical judgements and assessments throughout this evolution. There was a cognitive ‘to-ing and fro-ing’ of thought processes supported by actions which they hoped would unearth tangible case-building evidence. The theory of mind accounting in clinical reasoning encompasses this whole process. Mind accounting is perceptible during each of the three modes (routine, escalation and crisis). Figure 5.3 depicts the theory showing the ways nurses attempted to account or justify their reasoning as they worked in the modes of practice depicted in Figure 5.1 to develop a convincing believable case prior to referral.

Figure 5.3 The Theory of Mind Accounting in Clinical Reasoning



The actions explained in figure 5.1 can be layered onto figure 5.3 because the two occurred in tandem. Figure 5.1 can be considered as the cognition and actions in progress, with figure 5.3 depicting the metacognition, or their ‘thinking about their thinking’, working to account for their decisions and actions. As the nurses were working within the

modes, gathering information, checking with colleagues, seeking to gain control as confidence in their findings grew, they engaged in justifying their thinking. They undertook those actions whilst at the same time being motivated by their own apprehension, their need to have enough data to feel credible and the insatiable need to have credible grounds for referral. They sought the right language to use to make a convincing referral, they made use of the PAR score and drew on their knowledge and experience to inform their thinking as they worked to reduce risk to the patient and themselves.

Clinical reasoning was dynamic and lacked a specific format. It appeared erratic but earnest in each of the modes, despite protocols in place to assist and order thinking. As participants built the clinical picture they were able to make sense of the patients' deterioration and marshal their evidence to elicit a response from emergency support / back up teams. The contextual factors influencing the care of deteriorating patients included:

- The level of uncertainty the nurses found themselves working in
- Their perceived professional roles
- Their faith in the credibility of their story and its ability is to convince another professional of the legitimacy of their concerns
- Their values and beliefs.

The three modes of decision-making in deterioration encapsulate the cognitive processes the nurses underwent and what factors influenced this. The findings elucidate the influential nature of the relationship between the decision the nurse takes and the mode in which they are operating, e.g. routine, escalation or crisis. The dimension 'building their case' emerged as the central organising perspective conceptualised as the theory of mind accounting in clinical reasoning. The notion of 'mind accounting' describes how these modes determine the courses of logic and action.

5.7 Summary

This chapter has presented the findings from three phases of data collection and analysis collected from 24 participants. Dimensional analysis was used to develop dimensions which were then conflated and differentiated. A number of explanatory matrices were designed. Different dimensions were assigned as the central organising perspective to test relevance and salience. The literature counter-balanced the developing concepts and resulted in the addition of further dimensions.

The contextual factors that impact on the recognition and response to the deterioration of the unwell patient and influence decision-making when caring for such a patient have been conceptualised as a decision-making model that depicts three modes in which nurses operate. The factors within each mode that influence their reasoning and decision-making have been explored.

The explanatory matrix (Figure 5.1) is presented as the decision-making model which sets out the contextual factors that influence decision-making with deteriorating patients and the resulting actions and care. Figure 5.3 presents the overarching theory which explains how nurses make clinical judgements and reach the decision to refer a patient whose condition is deteriorating by incorporating the elements in the decision-making model. Interview and focus group quotations illustrate and support the explanatory matrix and subsequent theory.

The following chapter will explore and discuss the emerging theoretical underpinnings that have led to the development of this explanatory matrix and the theory of mind accounting. It will examine the psychological and social explanations for the behavior that has been described and observed. These explanations will be framed within the perspective of the theory of negotiated order developed by Strauss et al

(1963) and combined with the current social reality of acute care nursing. The chapter will weave together the literature, methodology, method and findings to explain the phenomena placing it in the context of acute care nursing illuminating the theory's implications for practice. Conclusions will then be drawn that generate a theoretical explanation for decision-making when caring for a declining patient.

Chapter 6 - Discussion

6.1 Introduction

The aim of this study was to understand how nurses reach their clinical decisions while caring for a deteriorating patient and to identify the contextual factors that influence this decision making process. The primary objective was to identify which contextual factors, within a ward environment, promote good quality care for this group of patients. This was achieved through studying the staff, events and practices in their own environment on their own terms. The data were then considered using dimensional analysis methods with the overarching central explanatory phenomenon labelled as “being believable”.

The study revealed a number of contextual factors that are conceptualised within a decision-making model depicting three modes in which nurses operate:

- Ward routine
- Crescendo of care
- Management of crisis

These modes influence the assessments, actions and interventions the nurses undertook. They also illuminate the point at which the nurses make a referral to another professional and how relevant information is prioritised. The ‘*theory of mind accounting*’ emerged as the explanation for how nurses clinically reason and make decisions when caring for a patient whose condition is declining. It is present in every mode.

This theory is revisited throughout this chapter in the light of the findings from the study and through examination of relevant literature. The discussion of the theory has been conceptualised under the following headings:

- Reducing Risk
- Being Human
- The Toolbox of Resources
- The Use of a Reasoning Script
- Reflective Reconstruction.

Negotiating connects the decision-making processes and anchors the apprehension, legitimising of concerns and cognitive 'to-ing and fro-ing' that I have called mind accounting in clinical reasoning. This chapter discusses these concepts and compares them to the literature highlighting the implications for practice. Finally, the limitations of the study are explored and their significance for future research examined.

6.2 Interprofessional Working - Negotiated Order

Caring for patients involves a complex array of interactions both within the team and with the patients. These interactions create meaning shared among those involved in the clinical scenario and relate to how people see themselves. Their views of themselves are built through the interactions they have had, the way they have been perceived and how they have treated one another (Jones 2003, Gray 2004). The essence of caring for the acutely unwell involves layered interactions with multiple members of the multidisciplinary team.

A process of negotiation, bargaining and reciprocity is continually taking place in order to achieve the patient care goal the nurse seeks. The nurses present themselves in particular ways during social encounters in order to create or win the most socially situated and desired outcome

available to them. For these nurses working in acute care the desired outcome is to be perceived as credible, professional and patient-centred practitioners. The theory of mind accounting deciphers these behavioural patterns.

The nurses laid claim to the struggles they experienced when managing deteriorating patients. This struggle created uncertainty, a need to gain control, and a compelling desire to maintain patient safety. This created stress and they sometimes found themselves out of tune with the routine ward environment, with differing priorities and with their locus of control destabilised. Attempts at managing the situation resulted in them practising within one of the three modes depicted in the decision-making model. Until they were absolutely sure of their findings, and therefore believable, they felt at odds with other professionals. In order to achieve a sense of managed social order, i.e. a response from a professional to their concerns, they began negotiations with colleagues, bargaining to achieve their patient care goals. The observed social processes that emerged from the data can be compared with the concept of 'negotiated order' developed explicitly by Strauss et al (1963), Strauss and Brucher (1964) and Strauss (1978) in their study of two psychiatric hospitals.

The Negotiated Order Theory is largely used by sociologists to explain how meaning is created and maintained in organisations focusing particularly on human interactions (Maines and Charlton 1985, Nadai and Maeder 2007). The concept was broadened to include different types of organisations and was published as a consistent theorem in 1978 (Strauss 1978). Strauss claimed that the process of negotiation is at the heart of social order and change; the processes of give-and-take, of diplomacy, of bargaining (Strauss et al 1963, Strauss 1978). He argued that all social order is negotiated order, not accidental, but follows the existing lines of communication and structural conditions of the organisation. In this study the relevant organisation is the acute care setting. He also purports that these are temporal, dynamic changes

which therefore continually revise the negotiated order. The negotiated order approach therefore seems an apt theoretical tool well suited to the rapid and complex interactions necessitated by a clinical team working together with the acutely unwell.

6.2.1 Finding the Middle Ground

In principle, negotiations take place in all areas of a ward. Decisions are made as to how work should be organised, who will do what and when the work will be done. Ward routines with set rules need to be understood by all to ensure duties are properly carried out. Sometimes 'rules' can be tacit rather than explicit, although the shared goal espoused by all the study participants, through their values and beliefs, was wanting the best outcome for the patient. Metaphorically this goal is the symbolic cement that holds the ward together (Strauss et al 1963).

'Rules' only partly explain the interactions and established social norms on a ward. One of the principle ways of people getting things accomplished in an organisation is through negotiating with one another (Svensson 1996). Nurses have a stronger position now than in the past and through the role of the ward manager, define some of the rules for interaction on the ward. They also play a vital role by defining the patients' medical status. The theory of mind accounting explains how nurses' abductive reasoning leads them to take certain actions when managing the sick patient. Their actions included a variety of negotiations with other colleagues prior to referral as part of the 'crescendo of care' mode, and in 'management of crisis' mode where making the referral to the medical team or a specialist nurse.

The three modes of practice demonstrated that nurses developed a negotiating interface through their 'mind accounting' which they then progressed as they moved along the continuum. Negotiations took place with their colleagues via 'collegial verification' and 'authentication'

and out of hours with the medical teams in order to carry out care for the patients they were concerned about. The tools they used as leverage included the PAR score and their reasoning script. Their use of compelling language to enhance their negotiating position and to finally convince the professional to attend was also noted.

In contrast, a breakdown in the ability to negotiate causes conflict, helplessness and betrayal. Contracts become broken and agreements are revoked. According to Strauss et al (1963) this is caused by organisational change, workplace conflict, a transient or temporary workforce and conflicting priorities. Within the context of this study it was evident that nurses were exposed to conflict between colleagues who sometimes did not respond as expected, in line with the policies and guidelines relating to acutely unwell patients. Out of hours care often resulted in medical teams who did not know the patient being asked to review a sick patient, and frequently nurses described the frustration of their request conflicting with the doctor's perceived clinical priorities at the time.

This study's findings showed that in some cases establishing negotiation was fraught with frustrations and required the use of specific tactics to elicit the actions the nurse was seeking through the referral. Stein's (1967) doctor-nurse game theory, where interplay occurred that enabled the nurse to inform and advise the doctor without challenging the doctor's position, was considered during analysis. However such 'medical hegemony' was rejected as a salient dimension in this setting. Stein et al (1990) later revised his theory acknowledging that the two professions had become more mutually interdependent, albeit with some way to go to dispel the myth that the nurse is more subservient than the doctor. Mind accounting suggests the navigation strategies employed by nurses in this study to overcome obstacles, resonated more with the theory of negotiated order than Stein's doctor-nurse game in that they were more deliberate and negotiated than subversive and machiavellian.

Nurses recorded different levels of satisfaction with their other professional relationships, but all asserted themselves and demonstrated tenacity when seeking help for the patient. The nurse's knowledge of the patient at ward level gave them a unique insight and negotiating power. Doctors and specialist professionals spend very little time on each ward. Their working patterns encompass short spans of time reviewing a large number of patients, together with operating duties and outpatient work. This gives the nurse an opportunity to package their referral in credible terms, using the appropriate reasoning script in order to elicit the action they are requesting. This negotiating stance empowers the nurse. Such a valuable advantage needs to be recognised and maximised to benefit patient safety and quality of care. The nurse can argue with force because they have knowledge about the patient's condition which, at that point, the doctor lacks. They can influence decisions which affect the patient and they can drive the norms for interaction imbuing their lone voice with conviction and strength.

These findings are consistent with Svensson (1996) and Allen (1997) which indicated that much contemporary nurse-doctor interaction goes beyond the passive influence described by Stein (1967) and indeed demonstrates a negotiated modified management plan for the patient. In contrast Coombs (2003) reported that the power held by doctors was instrumental in affecting the nursing role. Nurses felt marginalised and spoke of the need to play the doctor-nurse game in order to be heard. She concluded that intensive care decision-making continued to be strongly driven by medical knowledge and authority.

Out of hours care presented additional burdens for the study participants. There were examples of difficulties in getting the doctors to attend the ward when they were busy in A&E for example. Their proximity to the patient gave the participants an unparalleled role in co-ordinating patient care and protecting them from this 'organisational turbulence'. The unavailability of doctors or site practitioners greatly

increased the participants' workload. Nurses routinely undertook a range of activities, from taking blood samples to suggesting potential diagnoses which historically would have been within doctor's remit. It is important to note that the nurses did not undertake any risky practices which they perceived as beyond their role's capabilities. This 'medical gaze' modified the social order that usually prevailed in the ward. An improvement in the preparation of nurses for such scenarios is required. This would enable them to initiate the negotiation processes necessary for referral in a timely fashion reducing the impact on patient care.

6.2.2 Uncertainty

There are factors that predicate the likelihood of negotiations. These are situations characterised by change, uncertainty, ambiguity, disagreement, ideological diversity, newness or inexperience, and problem coordination (Hall & Spencer-Hall 1982). When a nurse noticed something out of the ordinary with a patient, this represented a change in the organisational order and called for a reappraisal or renegotiation with consequential changes in the social order as they moved into 'crescendo of care' mode. The cone of uncertainty that the nurses sought to reduce may have heightened the likelihood of negotiations taking place. This study found that decision circumstances were ambiguous and uncertain leading to debates among staff about a patient's care plan and needs. Not everything was negotiable, and the data revealed that nurses used coercion, persuasion and manipulation to entice a doctor or specialist nurse to review a patient they were concerned about, particularly if they were addressing a perceived superior.

The negotiated order approach places great emphasis upon the 'actors' to meet and argue about working rules and norms (Strauss 1982). Evidence exists that shows when nurses and doctors undergo shared learning their situational awareness improves, thereby suggesting an alteration in the social rules and norms they may have previously be

working within (Endsley 2000). This may have the added benefit of harmonising the social order and enable improved working relationships and responsiveness when caring together for an acutely unwell patient.

Social order is the product of meaningful interaction (or non-interaction) between actors, in this case health care professionals. Allen (1997) argues that rather than social order being thought of as negotiated, as described by Strauss (1978), it could be considered as something that is continuously accomplished. From this perspective negotiation then becomes one of a number of possible processes through which social reality is routinely constituted.

The theory of mind accounting comprises constant interactions, discussions, and communications among the clinical staff to bring about the level of care the participants sought. Framed in the theory of negotiated order, sense can be made of the way nurses reason and make decisions about patients. What is created through the negotiations is a blurring of established professional boundaries. Efforts are made to reduce the turbulence experienced by the participants in an endeavour to keep themselves and the patient safe. The negotiations are shaped by concern for a patient and by the participants feeling they were not being heard or appropriately responded to. The next section further examines the theory of mind accounting and how it endeavours to create negotiated order for the benefit of acutely unwell patients.

6.3 Reducing Risk

The notion of reducing risk and the development of the patient safety agendas have been key drivers in the NHS over the past decade (Odell 2011). The ward based critically ill patient has had a particular focus (NPSA 2007). This focus has been around recognising the deteriorating patient earlier and instigating the correct interventions in a timely fashion. This relies on ward staff effectively undertaking the necessary

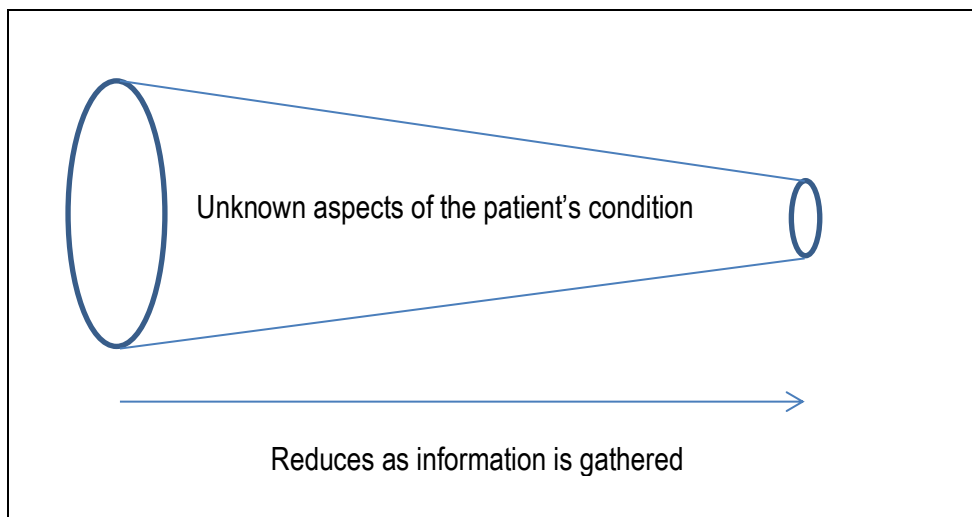
actions. Accurate nursing judgement and decision-making both contribute significantly to the safety and quality of patient care (Lamb and Sevdalis 2011). This research revealed a number of issues that have been conceptualised as reducing risk in the context of the deteriorating patient. The nurses spoke about their professional accountability, keeping the patient safe, and protecting their registration. The actions they took in the mode 'crescendo of care' and 'management of crisis' were largely about reducing the risk of further deterioration to the patient. Other actions concerned self-protection motivated by the fear of getting into trouble and placing their registration at risk. This study illuminated which contextual factors contributed to the risk calculations. These were:

- An ambiguous clinical problem that was often complex and poorly structured
- Time constraints
- Pressure on the decision maker
- Decisions were recognised to have high stakes and dangerous consequences for the both the patient and the nurse.

The findings of this study highlighted the anxiety that nurses often felt when they experienced feelings of uneasiness about a patient's status. This resonates with King and Macleod Clark's study (2002), in which nurses presented cases using strength and persistence. Their goal was to persuade other health professionals to assist them in their identification of the cause of concern and to initiate effective changes to treatment. These participants also responded analytically to their intuitive concern, seeking concrete, measurable evidence to support their suspicion through clinical cues. Once confident in their findings, these participants continued caring for the patient preparing equipment for rapid intervention in anticipation of the doctor's arrival. This is similar to how nurses in this study practised in 'crescendo of care' and 'management of crisis' modes.

The increasing complexity of care delivery demands that nurses make rapid decisions (Currey and Botti 2003, 2006). This poses risks due to the varying levels of the decision maker's knowledge and experience. In ambiguous clinical scenarios conflicting cues are apparent which make the decision more complex. Inexperienced nurses are less able to detect relevant cues and recognise patterns. Few prior studies have explored the multifactorial influences in this context. This research has identified those influences. The emergent decision-making model depicts uncertainty as a major contributor to the risk nurses felt. This is represented as a cone that narrows over time representing decreasing uncertainty as the nurses seek and gain more information.

Figure 6.1 Cone of Uncertainty



While operating in the modes 'crescendo of care' and 'management of crisis', the nurses expended much time and energy building the case in an attempt to reduce their uncertainty (figure 6.1). They were trying to make sense of the clinical picture to build a convincing case for referral. Their reasoning techniques consisted of them inductively building a picture whilst deductively detailing their hunch, seeking evidence to support their concerns; abductive reasoning. Once they believed they had a convincing case they then made the referral. This method of reasoning resonates with some of the seminal works that described a

hypothetico – deductive process where practitioners sought cues, made tentative hypotheses and then sought evidence to support them (Elstein et al 1978, Carnevali et al 1984). However, what is new in this study's findings is that the motivating factor frequently seen in the data was around reducing risk for the patient and the nurse. This is different to the problem-solving toward diagnosis motivation cited in the above studies. Nurses used abductive reasoning to reduce their uncertainty about the patient's condition as well as to develop confidence in what they believed was happening in order to make a convincing referral. The implication for practice is that delays in referral are due to the insistent and recurrent need to obtain a convincing case before referring driven by the need to be believable to others.

6.3.1 Early Warning Systems

The patient safety literature regarding deteriorating ward patients recommended the use of the 'Track & Trigger' scoring system (chapter 1 – section 1.3.2). This system has been widely implemented across the UK. The study site used a version called the Patient at Risk Score (PAR Score) (Appendix 1). This was an integral aspect of the ward routine when undertaking vital sign observations and the data showed that the PAR score was used extensively. Participants often referred to the PAR score as they described the condition of their patient. It appeared to be part of their vocabulary whatever mode they were operating in.

Many studies have attempted to evaluate the efficacy of the PAR score in preventing adverse events for deteriorating patients, but few have considered its role in the decision-making process (McArthur-Rouse 2001, Bright et al 2004, Odell et al 2009, Preston and Flynn 2010). Andrews and Waterman (2005) showed that nurses used the PAR score to legitimise a hunch that they may have had about a patient. Their finding is similar to this study. The PAR score provided a strict protocol that was widely accepted in the Trust and all staff were expected to

adhere to this. Nurses used the PAR score to insist on a doctor attending, it was also used as a legitimate reason to put out an emergency call. It was often the PAR score that led to the transition from operating in 'ward routine' mode to shifting to 'crescendo of care' mode.

Nurses relied heavily on the PAR score to boost their confidence. It assisted their decision-making by providing tangible parameters to suggest new actions, or even actions that they perceived as risky to their reputation. Andrews and Waterman (2005) discuss how this tool offers a language for nurses that resonates with the medical profession. I would argue that medical staff react from a mainly positivist stance: their training and their practice values hard data as a currency worthy of their attention and action. Papathanassoglou and Karanikola (2013) support this notion discussing how physicians rely on scientifically established knowledge, whereas nurses relied mostly on patient knowledge that is more relational and involves understanding of the individual's experience and response to treatment.

The PAR score provides clear parameters and numbers with specific assigned actions. Nurses in this study felt that the PAR score elicited greater reaction from their colleagues than when they communicated using their own words. As Andrews and Waterman (2005) state, nurses 'package' their concerns into language that doctors understand and believe. In this study the PAR score was used as a negotiating tool to convince others. It gave nurses permission to take risks and was worn as a cloak of self-protection with regard to their professional registration. This is a new finding with regard to decision-making using the PAR score.

6.3.2 Sharing the Risk to Manage Uncertainty

Nurses reported frequently feeling anxious and uncertain when in 'crescendo of care' mode, and even more so in 'management of crisis'.

The shift from 'ward routine' to 'crescendo of care' appeared to represent a mountainous transition. When operating in the latter mode nurses attempted to share risk in order to manage their feelings of uncertainty and anxiety. One of the elements in this process involved them seeking assurance from colleagues in the guise of informal advice. They needed to 'account' for their assumed hypotheses. The implications of this are that delays may occur because of their need to be assured rather than seeking timely and appropriate clinical interventions. There is a risk of 'failing to rescue' the patient, which is ironic given the underlying motivation is risk minimisation. This is despite the availability of tools such as the critical care outreach nurses.

Uncertainty is where there is doubt or a 'not knowing' that challenges the nurse's sense of confidence and/or control (Vaismoradi et al 2011). There are several factors that contribute to this feeling:

- i. Lack of available evidence
- ii. Differences in interpretation or
- iii. Disagreement with the evidence (Thompson and Dowding 2001).

These can be due to the practitioner's lack of knowledge of the subject, or limitations in current empirical knowledge or even a difficulty in distinguishing between personal ignorance and limitations of current available knowledge (Thompson and Dowding 2001). Uncertainty poses a dilemma for practitioners. They have to make a decision when faced with the reality of an unclear clinical situation. These scenarios are an unavoidable characteristic of clinical practice, particularly in acute care nursing (Vaismoradi et al 2011).

The mode 'crescendo of care' occurs at the opening of the 'cone of uncertainty' and this study revealed the frantic efforts of nurses to reduce this uncertainty. At this point the nurse was faced with multiple dimensions of uncertainty. This concurs with several other studies where when faced with an emergency situation with vague data, nurses'

anxiety levels rose (Cooper et al 2010, Endacott et al 2012). The researchers entitled this 'performance anxiety' and it was apparent in the majority of their participants with 12% remaining in a state of frozen anxiety. The authors found that as the participants' anxiety levels rose, their performance decreased and they were unable to access and apply their knowledge in some basic assessment tasks during patient deterioration. One example was acting on a single cue based on preliminary data findings rather than waiting to assimilate further data which would have steered them onto the correct decision path.

These findings are similar to Thompson and Dowding's (2001) view on the concept of 'bounded rationality'. They believe that individuals in high stress situations have a limited ability to rationally process information. Practitioners, although, expected to weigh all alternatives, tended to neglect obvious alternatives, and were unaware of their omissions. My study findings differed in that the participants earnestly continued to seek information, focusing on patient safety and continually reassessing whilst deciding when to refer or in the 'management of crisis' phase, after referral while waiting for a respondent. This is similar to Endacott et al (2012). Their study comprised registered nurses from medical and surgical wards in an Australian hospital. Their research showed that uncertainty led the participants to initiate more interventions. Endacott et al (2012) also found that actions taken were 'protocol-led' rather than 'decision-led'. The participants in this study also relied heavily on the PAR score to guide their decision making, but even so, some nurses revealed feelings of uncertainty led to a reluctance to contact the critical care outreach team.

6.3.3 The Speed of Decision-Making

Gobet and Chassy (2008) support the notion that limited thinking time affects performance. Many of the clinical situations the participants faced required fast responses to a rapidly changing clinical picture, particularly in the mode 'crescendo of care'. Furthermore, when the

outcomes are crucial the expert practitioner will deliberate. These deliberations may not be calculative problem-solving but rather reflecting on their intuitions. With ambiguous situations there is little information on which to base judgements (Hancock and Durham 2007). The literature suggests that in these situations there is a tendency for the practitioner to use cues to sift the data as discussed in section 6.4.1. Bucknall (2000) discusses how patient complexity slowed down decision-making. This was also in the face of unfamiliarity, uncertainty and the confidence of the nurse. The practitioner might choose to wait for further deterioration prior to escalating their concerns, again increasing risk to the patient. The series of simulation studies carried out by Kinsman et al (2009), Cooper et al (2010), Endacott et al (2012) showed how nurses can freeze in these situations due to rising anxiety levels. They sometimes, in simulation, do not believe the data they are collecting about the patient, conceptualised as 'ontological doubt', which exacerbates delays in instigating appropriate care. Nurses in this study continued to gather evidence to corroborate their intuitive concerns until they felt certain enough to make the referral. They spoke of feelings of anxiety and stress during this phase. Evidence presented by Gerdtz and Bucknall (2001) found that nurses overestimated risk and had a tendency to make cautious predictions, potentially slowing up the referral process. This was a feature of triage nursing in an Emergency Department (A&E) (Gerdtz and Bucknall 1999). My study did not concur with these theories. I found that once nurses picked up a change in a patient's condition they then described how they focused on gathering data, building a credible selection of data with which to make a referral. The greatest risk lies with the delay inherent in not making an intervention during this phase of working (RCP 2012). This risk occurs despite the availability of appropriate resources.

6.3.4 Mode Risk

This study describes the three modes a nurse operated in when caring for acutely unwell patients. An area of risk not examined in this study,

but worthy of discussion is whether the nurse recognised the correct mode in which they should be working. Although not observed or described by the participants, there is a risk that the nurse continues in 'ward routine' when they should be working at a higher level in 'crescendo of care' or 'management of crisis' employing different reasoning techniques. This may partly explain why we still have evidence of suboptimal care and reports of 'failure to rescue' in the literature. It is imperative that the nurse has the knowledge and clinical education to recognise how they should operate. This study was designed from the perspectives of the participants, who described their view of each scenario but without the ability to comprehend whether their mode of working was a legitimate choice given the intersecting factors. Fieldwork did not reveal a nurse practising in the incorrect mode, but it is difficult to extract from their reported stories if this was always the case. The quality of decision-making in these settings rather than how they reasoned clinically in the field requires further work.

6.4 Being Human

‘Human factors’ is a broad discipline that examines the relationship between human behaviour, system design and safety (NPSA 2012) (Table 6.1 – Main Categories of Non-Technical Skills). These human factors concentrate on individual behaviour, and how changing the patterns of behaviour are key to improving patient safety (Odell 2011).

Table 6.1 Main Categories of Non-Technical Skills

<p>Lack of technical skills can play a part in human error. Human Factors involve seven main categories of non-technical skills:</p> <ol style="list-style-type: none"> 1. Situation Awareness 2. Decision-Making 3. Communication 4. Team Working 5. Leadership 6. Managing Stress 7. Coping with Fatigue
Odell 2011

Situation awareness is defined as a ‘*perception of the state of the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future*’ (Endsley 2000). It comprises 3 levels shown in Table 6.2 overleaf. It is a concept used to understand the causes of decision error and a model for safe decision-making (Stubbings et al 2012).

Table 6.2 The Three Levels of Situation Awareness

Level 1	Perception of data in the current situation The perception of information the person faces
Level 2	Comprehension of the meaning of the current situation Integrating this information and developing an understanding of its meaning
Level 3	Projection of the near future status Based on this understanding, a prediction of future events
Endsley 2000, Kinsman et al 2009	

The theoretical model has been applied to many different areas including aviation, air traffic control, military command and control and emergency services encompassing the care of the critically ill. Its premise is that the practitioner bases their decision on their perception of the significance of their situation. The implications for acute care are that if the nurse's perception or understanding is flawed, a wrong decision could be made that may adversely impact on the patient. In acute care people do not work only as individuals but also in teams so the situation awareness of each team member needs to be effective. The model relates to cognition and perhaps links to how nurses use cues and heuristics in their decision-making. Drawing on cues and '*rules of thumb*' recognised from previous experiences may subjugate their awareness of the current situation.

Cooper et al (2010) found that the situation awareness of the student nurses was poor in simulation with a deteriorating patient. The students' global perceptions of the situation were low and they seemed unable to apply their knowledge and take appropriate action. This phenomenon was neither observed nor apparent from the interview data of this study when the nurses described their care of a specific patient. However, it was not possible to ascertain how other patients fared whilst the nurse prioritised the deteriorating patient. It is a possibility that there was a poor awareness of the rest of the nurse's caseload. However, the prevailing sense was that the participant was aware of other patients' needs and acted to protect and meet them.

The delay found in Kinsman et al (2009) and Cooper et al's (2010) study in getting help could be explained by the findings of this study. Nurses were so focused on improving the credibility of their referral that they delayed calling for help. Time spent in '*crescendo of care*' mode varied across participants, and the implication for practice is to equip nurses to recognise the need to refer as soon as possible, irrespective of their professional self-confidence and personal anxiety levels.

The time spent during 'crescendo of care' on 'collegial verification' and 'authentication' could be attributed to a need for a shared understanding of the patient's condition to increase common situational awareness. However research findings have revealed a cognitive mismatch between different professional groups leading to differing perceptions of situation awareness (Stubbings et al 2012). This has been ascribed to differences in the professional groups' education and training.

Increased tension between staff risks a breakdown in care co-ordination with potential disruptions to patient management. Improvements to situation awareness have been achieved when interdisciplinary teams have been trained together. With shared understanding of patient care goals and situation awareness more cohesive work practices ensue (Papathanassoglou and Karanikola 2013). This appears to be reflected in this study where there were many examples of nurses trying to refer a patient to a doctor who appeared, in their view, not to comprehend the seriousness of the case. In some cases this was because the nurse was using vague data to make the referral, thus poorly articulating their valid concerns, which the medical staff did not appreciate as serious. When nurses used a shared protocol or guideline such as the PAR score, doctors did respond more appropriately. This concurs with the literature on situation awareness in critical care circumstances (Stubbings et al 2012) and is explored further in relation to the differing discourses among professions and the 'script' used by nurses to voice their concerns (section 6.5 – The Use of a Reasoning Script).

Nurses introduced diverse tactics to capture the attention of the doctor. They tended to use forthright open communication rather than the veiled communication reminiscent of the 'doctor-nurse' game described by Stein (1967) and Stein et al (1990). This differs from the findings of Lopez (2009). There, nurses used subtle and cryptic verbal cues to communicate findings. Participants edited information to influence doctors to order treatments consistent with their preferences. My study revealed tactics such as rank, threats to report the doctor and careful

selection of language so as to instil anxiety in the doctor. Some of this related to how confident the nurse felt, with more senior nurses more confident using their rank than more junior staff. These behaviours emerged when the nurse was practising in 'management of crisis' mode and the strategy was reported by participants as largely successful.

The degree of situational awareness is dependent on an individual's experience of 'like situations' relating experience to the concept (Bond and Cooper 2006). It also depends on their ability to continually assess and process data and adapt their behaviour to meet the needs of the situation. In order to improve the response to deteriorating patients it seems important to enhance situation awareness among professional groups collectively so that more anticipatory and effective decision-making can be assured. Inter-professional learning may contribute to this so that communication of information and decision-making structures are improved. As nurses learn to be more assertive, confidence and decision-making autonomy will be fostered (Stubbings et al 2012). This may improve clinical outcomes for patients.

6.4.1 The Use of Cues

The gathering of technical, interactive and perceptual cues begins from the moment of first concern about the patient, reflecting the theories described by Dowie and Elstein (1988). The nurses gathered information developing theories (hypotheses) about what might be wrong with the patient. This cognitive function reflects the information-processing model of decision-making. The nurses continued their inductive reasoning seeking further cues to confirm or refute their initial hypotheses. This abductive fluid movement reflects the Cognitive Continuum theory in the decision-making process. However, this only describes one element of clinical reasoning by the ward nurses. The participants also discussed drawing on previous experience and knowledge gained from previous situations which offered intangible

cues reflecting the intuitive-humanistic approach to decision making (Hancock and Durham 2007).

All of the participants attempted to corroborate their subjective awareness of change with objective evidence, the inductive-deductive cycle of thinking. This was described by Cioffi (2000) and also Smith (1987). Nurses used cues from a variety of sources. These included character changes in the patient, increasing PAR scores and noticeable vital sign alterations. They continued to use cues as they built the clinical picture to develop the credible story prior to referral. They also continued to do this when operating in the 'management of crisis' mode. This differs from the findings of Cooper et al (2010) who found that 3rd year nursing students exhibited decreased performance as the patient's condition deteriorated. They were less likely to note important vital signs, such as respiratory rate. They attributed this to feeling anxious, which they termed '*performance anxiety*'. The participants in this study also felt anxious, but this appeared to be related to the uncertainty of the situation which they worked to reduce through their problem-solving. Their anxiety also seemed to motivate them to seek more assurance and monitor more actively in order to gain some control over the situation.

This study demonstrates that human factors, in particular situational awareness are a valid and explanatory factor in the theory of mind accounting. The real time reactions of the nurse are integral to clinical outcomes for the patient. If the nurse's judgement is flawed then the patient is at an increased risk of harm.

6.5 Toolbox of Resources

The theory of mind accounting in clinical reasoning consists of a toolbox of resources that nurses draw on to inform the three modes of decision-making in which they operate. The selection and use of these tools

influences the interactions, decisions and actions they took. The toolbox enables them to make sense of their thinking. The data in this study revealed the following 'tools' that nurses utilised as they moved between the three modes in the decision-making model. They were:

- Knowing the patient
- Knowledge and experience
- The team.

Each of these will be discussed in the next section.

6.5.1 Knowing the Patient

'Knowing the patient' was a concept that nurses laid claim to when describing their caring experiences. It began when the nurse noticed something different about the patient and began information gathering as they started to build their case. The nurses described a change in the expected trajectory of the patient's recovery. This led to a patterning of data which may also have been developed from their knowledge of other patients with similar conditions and from previous experiences that are recalled when facing similar clinical scenarios. This concurs with the forward and backward reasoning that Arocha et al (2005) conceptualised. Knowing the patient enabled the nurse to respond to subtle changes in their condition (Minick and Harvey 2003) having spent time, even just a few consecutive shifts, with them. The participants gave examples where they detected subtle physical and psychological changes. This concurs with the findings of Cioffi (2000).

However, modern healthcare means patients often have very short stays on a ward e.g. 23 hours is the average maximum visit to a short stay surgery ward (Johnstone et al 2007). Medical Assessment Units admit patients at their sickest point but then transfer them to an on-going ward within 48 hours. In addition many wards operate a long-day

12-hour shift pattern which means a fulltime nurse works a maximum of 3 days per week reducing continuity of care across a span of shifts. Shortened hospital stays, increased patient acuity and advances in technology all require nurses to think quickly to resolve problems (Simmons 2010). The implications are that nurses may struggle to effectively build their case for referral and intervention if important patterns are missed due to the time constraints imposed by today's NHS. This could lead to a greater risk of 'failure to rescue', late recognition and response to deterioration.

6.5.2 Knowledge and Experience

Knowledge in nursing comes in two forms, experiential knowledge and knowledge gained from formalised education. Experiential knowledge is the integration of knowledge and experience (Andrews and Waterman 2005). Theorists' descriptions of a nurse's level of experience and the influence of this on decision-making differs according to their level of practice (Gillespie 2010). For example a novice nurse characteristically uses rule-based thinking with a focus on task completion. In contrast more experienced nurses tend to view patient situations as a whole and within context (Benner et al 1996). This study showed no difference in the way nurses responded to uncertainty and the mode in which they operated was similar across all groups but the more senior experienced nurses elicited different outcomes, such as a more timely response from the doctor. This was because senior staff had no hesitation in seeking help when concerned about a patient, nor any concern for how their persistence would be perceived. Pirret (2007) showed in her study of 27 ICU nurses in New Zealand ICUs a need for clinical educators to work alongside nurses to embed knowledge and provide challenge. This enhanced their ability to capitalise on their skills and articulate, in this case, their respiratory knowledge in their decision-making.

Education programmes, by themselves, are inadequate at producing effective acute care nurses. A clinical environment that enhances

nurses' theoretical knowledge and language needs to be established in order to equip nurses with the tools to describe the cognitive aspects of their practice. This would also augment their standing within a clinical team. Nurses also need to take responsibility for their own professional development. They rely heavily on knowledge gained from or consolidated through clinical experience. A nurse's knowledge and experience, according to Benner (1984) influences the level of expertise at which they practise. Within the theory of mind accounting this 'tool' is available in varying amounts to a nurse when faced with a deteriorating patient.

Benner (1984) and colleagues' seminal works on the link between experience and expertise are still largely considered relevant today and intensely debated (Benner et al 1996). The experienced nurse can assist the novice to recognise the salient aspects of the patient's condition and prioritise them (Baumann and Burbonnais 1983). My study comprised a range of nurses with different levels of experience. Andrews and Waterman (2005) showed that the more knowledge and experience a nurse had, the more likely it was that they had a systematic approach to assessing patients. This differs from Kinsman et al (2009) whose simulation study revealed that an adequate knowledge base did not equate to optimal performance of, in this case, student nurses. It is likely that a greater level of experience mitigates the difficulty of making complex decisions, in particular when making rapid decisions (Currey and Botti 2006). This was observed in this study where although all participants worked in all three modes, the more experienced nurses and those of a more senior rank, such as sisters and charge nurses, achieved quicker outcomes for patients and elicited more prompt actions from doctors when they made their referrals or sought help.

6.5.3 The Team

The role of the team is increasing with decision-making becoming a team task across disciplines as well as within the hierarchy of the ward team, i.e. sister and staff nurse (Lamb and Sevdalis 2011). This requires competent team coordination. When students and novice midwives felt secure with their clinical colleagues, confidence levels increased and they were able to practise with relative ease and fluidity. With an effective mentor supervising they could experiment with judgement and decision-making. Conversely, if they felt anxious or insecure that function was severely compromised and their ability to make or suggest decisions was adversely affected (Young 2011). Decision-making is a socially negotiated activity. Authoritarian behaviour does not promote a healthy working environment and may have a detrimental effect on the progression of decision-making skills. Junior staff can feel undermined. They may acquiesce to colleagues and become reluctant to assume decision-making responsibility.

Tension among the team causes difficulties for team members to feel like they can act independently. This may impact the quality of decision-making as shown in Coombs' study describing an environment of medical hegemony within the ICU (Coombs 2003, Odell 2011). Teams are an integral component of social order with members negotiating that order as perspectives shift. This study saw nurses using different resources to address ambiguity and uncertainty in their thinking, when faced with an unclear clinical picture, such as 'collegial verification' and 'authentication'. This was similar to the findings of Currey and Botti (2006) who found that the quality of nurses' haemodynamic decision-making during the 2-hour recovery period following cardiac surgery was influenced by the degree of decision support by nursing colleagues. Thompson et al (2001) also found that nurses preferred to access evidence from experienced colleagues. This supports a similar finding in this study. Clearly, if experienced nurses are to act as a clinical resource, they require on-going professional development and support

to ensure their thinking is based on current best practice and that this can be clearly articulated to junior staff.

6.6 The Use of a Reasoning Script

Timely referrals are an important patient safety factor of health care (Leonard et al 2004, NPSA 2007). Referrals to other professionals were a key action undertaken by all of the participants in this study. Referrals were often made by telephone in the absence of the doctor. The credibility of this referral was very important to the participants, and why they spent time in 'crescendo of care' mode gathering convincing evidence before making the call. This finding is similar to Smith (1987), Cioffi (2000a) and Andrews and Waterman (2005) who discuss the fear nurses have of being ridiculed through inappropriate referrals. These studies showed that nurses had their concerns first confirmed by an external person, such as a colleague or by comparing their thinking with a protocol. This way of overcoming the fear participants felt I conceptualised as 'authentication' and 'collegial verification'. It legitimised nurses' reasoning and lessening the potential risk of embarrassment. The language used by the participants reflected the protocols in use, namely the PAR score. This too was part of the credibility and legitimising of the call. However, several of the participants in the study spoke of their frustration in communicating their reasoning effectively enough to elicit the required response. This was particularly evident when they were convinced of the need to seek help but unable to articulate why.

Articulation seemed to pose problems for some of the nurses. This is similar to many studies on nurse decision-making. Several explanations have been offered. Nurses have their own professional language they use in their assessments and for communicating those assessments. This has been shown to be the case across other professional groups (Andrews and Waterman 2005, Ajjawi 2007). Flexibility of discourse

and the ability to convey 'grab' is essential to elicit the desired response. Nurses in this research appeared to use a 'reasoning script'. This largely comprised objective patient data and the PAR score. Nurses stated that vague referrals were not effective. They used different strategies to emphasise the importance of their concerns but sometimes felt as though they were not being heard. Their reasoning script was not always effective. The importance of productive succinct referrals was recognised by the NPSA (2007) who proposed the use of a communication toolkit (Institute for Healthcare Improvement (IHI) 2011). Commonly known as SBAR (Table 6.3) the toolkit allows a systematic and consistent way of communicating concerns across professional groups following a comprehensive assessment of the patient. It also allows the development of critical thinking, according to Leonard et al (2004).

Table 6.3 SBAR Toolkit

<p>SBAR (Situation, Background, Assessment, Recommendation) is an effective and efficient way to communicate important information. SBAR offers a simple way to help standardise communication and allows parties to have common expectations related to what is to be communicated and how the communication is structured.</p> <p>S=Situation (a concise statement of the problem – what is the situation?) B=Background (pertinent and brief information related to the situation – what is the clinical background?) A=Assessment (analysis and considerations of options — what you found/think – what is the problem?) R=Recommendation (action requested/recommended — what you want)</p>
<p>(NPSA 2007, Health Military 2009, IHI 2011)</p>

The literature discusses this in relation to nurses drawing on intuitive knowledge rather than concrete data (Andrews and Waterman 2005). However, in this study, even when nurses felt they had a convincing case and concrete data, there appeared to be a difficulty in articulating

their concerns some of the time. They used different strategies to grab attention, such as putting out a medical emergency call when a doctor was not responding, and using their hierarchical status to persuade.

The on-going challenge is how to integrate nurse decision-making with that of the medical staff in a manner that streamlines care and minimises frictions (Lamb and Sevdalis 2011). Learning how to communicate reasoning so that referrals are made with clarity is an important component of nurse education and training. Discussion and articulation of clinical reasoning may raise awareness of reasoning processes that may otherwise remain subconscious. This could provide nurses with the opportunity to interrogate their own reasoning and underlying assumptions, recognising strengths and highlighting weaknesses. It also enables educators and mentors to note reasoning performance and to provide specific feedback and strategies for onward learning (Ajjawi 2007). Observation and constructive feedback of a student-patient encounter is reported to be a powerful stimulus for learning during clinical education (Lindquist et al 2004). Simulation techniques with feedback have also been shown to have the capacity to improve aspects of nursing care associated with the detection and management of patient deterioration with registered nurses (Kinsman et al 2012). Education and training using simulation where mistakes can be made in a safe environment and feedback given outside of the clinical area is worthy of further consideration.

6.7 Reflective Reconstruction

The literature reports extensively on how practitioners use heuristics (subjective probability judgements) to guide their clinical reasoning in uncertain decision-making situations (Pyles and Stern 1983, Benner and Tanner 1987, Cioffi 1997). Given the 'swampy' nature of much nursing practice (Schön 1988), many nurses draw on intuitive approaches to dealing with uncertainty. Gut instinct can be a guiding force with

heuristic strategies partially explaining how nurses arrive at intuitive judgements (Cioffi 1997, Thompson and Dowding 2001). Intuition, as a process of reasoning, has been defined as 'understanding without rationale' (Benner and Tanner 1987). It is characterised by a lack of ability to explain or understand how or why judgements and decisions have been arrived at. It is 'knowing' but not being conscious of the reasoning process and not being able to verbalise this or be able to determine the source of the knowledge. Intuition appears to jump the usual analytical reasoning processes discussed in the literature. This makes it difficult to articulate the basis for these decisions. Intuitive thinking emerged as part of moving from 'ward routine' to 'crescendo of care' and thereafter. Participants told stories of 'just knowing' and used the term 'intuition' in their discourse. Its use has been reported as the first stage of detecting deterioration and something nurses rely on (Andrews 2004). They spoke of noticing differences in a patient, or recognising similar situations from previous patients they had cared for, drawing on pattern recognition. They spoke of 'just knowing' but not necessarily knowing why. Andrews and Waterman (2005a) call this 'intuitive pick-up' and argue that it is a matter of seeing, then remembering, making the connection between knowledge and experience.

Comparing and contrasting as nurses practised was a feature of patient assessment and information gathering in each of the modes, particularly 'ward routine' and 'crescendo of care' modes. Their use of intuition was as a trigger for further investigation, a feature of operating in the mode 'crescendo of care'. They used their 'intuitive pick-up' to work on building their case to become believable. It was not something that led them to automatically make a referral. This finding differs from Andrews and Waterman (2005) who showed in some cases nurses were convinced enough to refer to a doctor.

Traynor et al (2010a) found that registered nurses described intuition through a narrative where nurses positioned themselves as agents at

the centre of events. The nurse-narrator heroically and autonomously solved problems, saved lives, or battled other professionals' bad decisions based on the vague but firm belief that something was wrong and something needed to be done about it. In addition, they did not always have the time or energy to follow their leads. This differed from this study where the participants used their intuitive feelings to continue to work to solve the problem, but not in a heroic way. Intuition formed part of their abductive reasoning process in building a credible case with which to refer.

Authors have said that if a patient looks ill, then they are ill (Andrews and Waterman 2005, Challiner and Smith 2009). The participants in this study discussed examples where they knew a patient was unwell. They told stories of patients they had been convinced were declining and how each time this had been an accurate assessment. However, these case studies were being reflected on, reconstructed and retold. It could be argued that nurses do not always know when a patient is deteriorating and that the re-telling of the case causes them to 'back-fill' the facts as they now know them, thus rebuilding the case using reflective reconstruction. Lamb and Sevdalis (2011) argue that nursing judgement and decision-making are only made visible in retrospect when the practitioner is reflecting on an incident. It is an important concept in the way intuition is used by nurses when re-living experiences and reflecting on them. Using reflection in this way to identify intuitive thinking may help in training for acute care nursing. The implication is that if a nurse is operating in the wrong mode for the situation, they are going to do the wrong things and make the wrong decisions for the patient. This may explain why we still see 'failure to rescue'.

6.8 Appraisal of the Theoretical Stance

This study embraced symbolic interactionism and pragmatism as its theoretical stance. Both are shaped by interactions and viewing reality as multiple, fluid, active and creative (Bryant and Charmaz 2007). Meanings emerge through practical actions to solve problems and through building views of ourselves and others because of the interactions we have had and the way we are perceived. The emphasis is placing the researcher in the world of the participant in order to see things from their perspective.

Clinical reasoning with deteriorating patients is a problem solving activity. It is an inductive process that is a complex social process. Making a referral to another clinician is also a social process. Positioning the research philosophically in symbolic interactionism and the epistemology of pragmatism enabled the perspectives of the participants to be revealed. The theoretical stance harmonised with the complex social process of decision-making and was congruent with the methodology and methods employed to gather the data. Moreover, it gave permission to use a lens through which the cognition and metacognition of the participants emerged, viewing the world from their perspective. Schatzman (1991) stated that this stance reveals '*all that is involved*' in the data. Recognising that this may not be completely possible and some insights may not have emerged, its inductive nature offered a platform for meanings to emerge revealing the theory of mind accounting. Pragmatism is an epistemology that states knowledge is gained through problem solving; its essence is practice related therefore resonating with the research aims and objectives. The theoretical stance in which I positioned the study enabled the complex real world of clinical reasoning to be illuminated.

6.9 Limitations of the Study

There are a number of limitations to consider with the study. Because of the study's interpretative design there is a risk that my interpretation of the data and what the participants reported to me as their experiences may not have wholly represented their world. The participants may not have expressed every aspect of their thinking and decisions. My novice status as a researcher may not have drawn out all their clinical reasoning and decision-making, and some stories were retrospective in nature and may have changed from when they originally took place. Despite the rigour applied their insights may not have been captured correctly. Some insights may have been missed due to not being able to use observations as data. This may have limited the claims this study makes.

The sample was a narrow group of nurses. Fieldwork was undertaken in only two wards that were quite specialist in their casemix. There may have been different insights revealed in other wards and clinical areas where nurses care for deteriorating patients. The Focus Group comprised of mainly junior nurses which perhaps could have influenced the findings. It may also have been interesting to gather data from other professions working with the nurses in the wards. This study does not capture their perspectives. Greater insights may have been revealed if the study had used a setting with more deteriorating patients such as the Emergency Department or the Medical Assessment Unit where patients' conditions are often quite unstable.

The accuracy of judgements made and the quality of the outcomes was not studied here, but represents an important aspect of quality decision-making that requires further investigation in the real world of practice. The challenge with research that examines thought processes and cognition such as in decision-making is that it is only possible to 'infer' through observation and that retrospective accounts are reliant on the

memory of the participant as they tell their story. We cannot 'see' reasoning, a judgement or a decision (Thompson 2011).

There is within the healthcare literature evidence that compares the novice decision maker with the expert decision maker and highlights important differences (Benner 1984, Benner and Tanner 1987, Benner et al 1996, Currey and Botti 2006, Gillespie 2010). Although the comparison of the novice and expert would be illuminating, it was beyond the scope of this study. The perspective of the patient in relation to the way acute care nurses make clinical decisions would also have been an important and enlightening viewpoint; I did not seek to examine this perspective.

I acknowledge that the theory developed in this research is based upon the experiences of a particular group of nurses working in one district general hospital. It is not possible within the interpretive paradigm to produce generalisable results, since a major philosophical position of this paradigm is that there are multiple constructed realities. The prime methodological goal was to investigate in depth the experiences of particular participants in a discrete context, not to sample a population with the intent of generalising findings. Instead, the strategy adopted rests on the position that the tendency to generalise may prevent the development of understandings that remain focused on the uniqueness of human experience (Ajjawi 2007). It is anticipated that readers of this research will consider the applicability and resonance of the findings to their situations. Through such exploration the theory produced by this research can be further tested in different settings.

6.10 Summary

Care of the acutely ill patient involves complicated decisions undertaken rapidly in dynamic fast changing environments. Nurses have to be equipped with the decision-making skills necessary to deliver safe,

effective care and prevent patient complications (Currey & Botti 2003, Hoffman et al 2009). Decision-making takes place within and is to a certain extent governed by the ward's social order. Staff constantly negotiate with one another as well as navigate this social order as they endeavour to build their case. They abductively reason while managing the care of their patients. The three modes in which nurses practise;

- Ward routine
- Crescendo of care
- Management of crisis

reflect the renegotiation, reappraisal, and continual reconstituting of social order. These actions rely on tacit and nuanced understandings between professionals. Mind accounting in clinical reasoning has built a substantive theory to explain the social processes at play as nurses care for patients throughout these three modes and when they are escalating their concerns.

A deeper understanding of nurses' decision-making can yield important benefits including clinical effectiveness, improved ability to work in partnership with patients and a strengthened position within the multidisciplinary team to assert their opinion and have their concerns heard (Buckingham and Adams 2000). This could translate to teaching and learning situations with undergraduate and novice nurses developing their abilities with recognised communication tools such as SBAR. Learners are, in turn, able to evolve their own understanding of the clinical decision-making process, how to communicate their reasoning and, importantly, how to critique their own practice.

The value of simulation training, exposing nurses to rapid decision-making in uncertain conditions with assessment of performance and objective feedback may help nurses with the skills required for these environments (Cooper et al 2010, Buykx et al 2011). This would allow a

transparent view of performance monitoring and systematic goal setting for improvement (Lamb and Sevdalis 2011). This also permits detailed exploration within a safe environment of a range of influences on the decision-making process such as team factors, stress, time pressure and varying amounts of clinical information. Training should include more emphasis on developing and maximising clinical experience and expertise rather the prevalent emphasis on knowledge acquisition (Rattray et al 2011). Consistent with Rattray et al (2011) this research demonstrates that knowledge acquisition alone is insufficient to equip staff with the appropriate skills. Education delivery methods that incorporate or mimic real ward settings such as simulation training may enable the nurses to feel more confident in their decision making and escalation of concerns.

Chapter 7 - Implications

7.1 Introduction

In this final chapter, I reflect upon and confirm how I have met the aim and objectives of the study, offering summaries of the findings and the implications of my study for nursing knowledge and practice. I also make suggestions for further research and discuss my previous and proposed methods of dissemination of my findings. Finally, I make explicit throughout this chapter how this study makes an original contribution to nursing knowledge relating to practice.

7.2 Overview

The international evidence suggests that 'suboptimal care' remains a problem over a decade since the phrase was coined (McQuillan et al 1988). Evidence remains that shows that missed indicators of deterioration, failures in help-seeking behaviour are putting patients at risk (NPSA 2007, NICE 2007, Odell et al 2009, RCP 2012). The casemix of patients in today's NHS comprises patients who are acutely unwell. Nursing staff are responsible for caring for these patients. Their work involves assessing and monitoring the patient's condition and escalating concerns in a timely fashion to a senior professional for help and intervention. Central to a timely referral is the reasoning and decision-making the nurse undertakes and knowing when to make that call.

In acute care, decision-making takes place in a clinical landscape of uncertainty, complexity and ambiguity. The way nurses cope and act when in this situation is poorly understood with decision-making of deteriorating patients in acute care wards sparsely reported on. Traditionally patient deterioration data and decision-making in this context have been gathered in simulation settings, or by retrospective

analysis of patient records and interviews after the event and after input by critical care experts. No research to date has prospectively examined the factors that influence decision-making at the specific point when a patient's condition is deteriorating in the actual ward area. This study examined the factors that affected how nurses made decisions when caring for the deteriorating patient by asking the following research questions:

- i. What are the contextual factors that impact the recognition of and response to the deterioration of the unwell ward patient?
- ii. What influences decision-making when caring for such a patient?
- iii. Which contextual factors promote good quality care (defined as timely intervention) for these patients?

The aim of the study was:

- To understand the interaction between staff, events and practices when clinical decisions were made, the point at which referrals were made and what information was given priority in those decisions.

The primary objective of the study was:

- To generate a theory of decision-making in the presence of clinical deterioration in practice from practice.

Using grounded theory methodology and Schatzman's dimensional analysis (Schatzman 1991) data from interviews, a focus group and memos were collected and analysed. Dimensions were created and challenged through constant comparison. From these, explanations were developed that illuminated the processes in play when caring for a deteriorating patient prior to referral on.

The study revealed three modes of practice. These were:

- Ward routine – customary reasoning
- Crescendo of care – abductive reasoning
- Management of crisis – confirmation reasoning.

The factors that influenced the recognition, response and decision-making when caring for a deteriorating patient were:

- The level of uncertainty the nurses found themselves working in
- Their perceived professional roles
- Their faith in the credibility of their story and its ability to convince another professional of the legitimacy of their concerns
- Their values and beliefs.

Through the three modes nurses reasoned and made sense of the clinical information they picked up with patients they were worried about. They spent time marshalling this data until it served them as a believable credible case with which to refer to another professional in order to receive assistance and then progress the patient's care. This process involved negotiating and bargaining to elicit action for the patient and themselves. Their goals in these actions and interactions were to keep the patient and themselves safe. This was underpinned and motivated by their professional and personal values and beliefs. Throughout the whole decision-making process nurses accounted for every decision and judgement they made until they were convinced and confident in what they believed was happening. They then made the referral to a more senior professional. This was conceptualised as the theory of mind accounting in clinical reasoning.

7.3 The Impact of this Research

Being in the real world with the participants, sensitising myself to their world and exploring the phenomenon from their perspectives new insights into clinical reasoning and decision-making have been illuminated. Using dimensional analysis and the grounded theory paradigm enabled understanding of the phenomenon from the experiences of the participants. This research has developed the theory of mind accounting contributing to the knowledge about clinical decision-making in acute care nursing. This unique contribution is now considered from four perspectives: its impact on policy, practice, education and further research.

7.3.1 Impact on Policy

The patient safety agenda remains a key area of concern at policy level (NPSA 2012). Tools and guides have been published to assist clinical staff and are widely used, such as Track and Trigger systems. Current policy and financial constraints in the NHS have resulted in a higher acuity of patient and shorter lengths of stay. This demands a workforce that is able to respond effectively to these changes. This study revealed new insights of nurses needing to have confidence in their hypothesis prior to seeking help and having to account for their reasoning at every stage in the process. This impacts on education policy development around equipping clinical staff with the skills and competency to be able to make accurate and fast decisions in an increasingly complex environment. Close collaboration between the policy makers and education providers is essential in order to address this issue.

Government policy thus far has advocated 24-hour critical care support for ward staff (NCEPOD 2005, RCP 2012). For some Trusts this has been set up as 24-hour critical care outreach teams (Higgs 2009). This study revealed the vulnerability of patients and staff out of hours with the

greater risk of delays occurring. Many Trusts do not operate outreach teams out of hours (Higgs 2009). Indeed the critical care outreach support offered in this study centre was only operational in 'office hours'. Trusts may need to revisit this provision in order to provide adequate support to ward teams working at night time, weekends and public holidays.

Local policy at Trust level may also need to be reconsidered around shift patterns. For example the 12-hour shift pattern reduces continuity of care across a span of shifts reducing the ability of the nurse to get to know the nuances of changes in a patient's condition and may lessen their sensitivity to subtle changes. Providing a shift pattern with greater continuity such as reverting back to an 8-hour shift pattern day could be considered.

7.3.2 Impact on Practice

This study has illuminated the processes by which clinical decisions are reached when caring for a declining patient. The three modes of practice that nurses use in clinical reasoning are articulated for the first time in this research. The theory of mind accounting in clinical reasoning contributes to the body of practice knowledge by offering more insight into the social interaction of teams and the cognitive process that staff employ when caring for a deteriorating patient. The use of qualitative methods allowed me to capture the experiences and interactions of the nurses from their perspectives; and to gain an understanding of their realities. The features of interpretive research enabled me to explore complex human reactions in the real world of clinical practice where they occurred. This is important as a greater understanding of decision-making enables us to develop practice and appropriate solutions.

The clinical reasoning patterns used by nurses in this study were cyclical and diverse. The processes were largely attributed to the

different perspectives nurses held about a situation that altered their reasoning and actions. The implications on practice are that it is crucial that the nurse holds the correct perspective in order to initiate the right actions. Accuracy in reasoning was not explored in this study but a significant aspect of practice is that nurses need to be able to make clinical decisions quickly albeit in an ambiguous and rapidly changing clinical scenario. This research showed that delays were inherent due to the need of nurses to account for their reasoning before acting, particularly when practising in the crescendo of care mode. Delays may be minimised if nurses developed the skill to recognise when their intuitive concerns for a patient are accurate and then to take corrective action in the absence of 'hard' data to support their hunch. Exploration into how this could be made visible needs to be undertaken. It is essential because if the nurse's judgement is flawed then the patient is at an increased risk of harm.

The research highlighted the importance of being able to clearly articulate and communicate concerns at an early stage using convincing language to enlist help. It also highlighted the internal turmoil, fear and uncertainty nurses experience when they are caring for a sick patient. This is important for education establishments and hospitals who train and mentor students and nurses new to an area of practice. They require the tools to undertake this task effectively and with ease. This study setting did not widely use the communication tools available such as the SBAR Toolkit (IHI 2011). A systematic, consistent method of communication that provides a succinct effective referral should be used and the use of a framework should be considered to aid them.

Making a referral requires social interaction, and involves a process of negotiation in order to achieve the patient care goal the nurse seeks. This study found that debates took place among staff to meet this end. Patient outcomes may be improved when an approach that embraces a shared understanding of the clinical picture and a cognitive 'match' between differing professional groups which increases situational

awareness is developed. This may allow more anticipatory and effective decision-making carried out collectively.

The emerging theory and decision-making model offer an alternative explanation of the way nurses assess and intervene when concerned about a patient. This is significant because timely accurate decision-making is fundamental to providing quality care.

7.3.3 Impact on Education

Having a greater understanding of the cognitive processes, behaviours and values that embody the nurses are highly influential in learning and professional development. This research has shown how clinical decision-making and its communication is a complex, multi-dimensional phenomena that are influenced by various contextual factors. The interpretations generated in this research may be used as frameworks for the design of health professional education curricula or continuing education sessions aimed at promoting the development of clinical decision-making and communication of reasoning. Such educational programs may be designed to target health care professionals at specific stages in their professional lives, from novice to expert, such that learning is optimised to meet their needs. This is important because this study showed that junior nurses sought knowledge from their colleagues. It is imperative that on-going learning and competence development is afforded to the experienced nurses who supervise and mentor new, junior and student nurses on their ward.

Learning in simulation has shown to be beneficial (Kinsman et al 2012). Observation and constructive feedback in a simulation environment allows nurses to hone their assessment and referral skills safely. Given the evidence that teams work better when they undergo shared learning that improves their situational awareness, consideration may be given in the light of these findings to providing this training as interprofessional events. It is clear that knowledge acquisition alone is insufficient, and

educational delivery methods that incorporate or mimic real-ward settings should be encouraged.

7.3.4 Impact on Research

This study examined the world of one acute Trust in the UK. It encompassed the cultural world of one group of staff. Exploring the implications of this substantive theory in other settings in the UK and abroad would be interesting for future research. It would be appealing to explore the way other professions who care for the acutely unwell reason and undertake decision-making. This may enhance our understanding further and may try out the theory's 'fit' across different professional groups. Another area that I did not explore is whether the mode the nurse was practising in was the correct mode for the clinical scenario they were facing. This too requires further investigation and may offer an opportunity to develop the theory. Exploration of how time pressures, stress and having access to varying amounts of information impact on decision-making in acute care may further enhance our understanding of the phenomenon.

The literature discusses situational awareness and effective team working as important factors when caring for sick patients (Stubbings et al 2012). More clinically based real-time studies are required to explore the effect of the working environment on decision-making. These could include investigating what constitutes optimal clinical and organisational effectiveness in this setting.

In depth comparison across nursing roles was not explored in this study. This provides an opportunity for further research to ascertain what specific needs nurses may have according to experience and role. This may inform skillmix discussions within Trusts to maximise patient safety.

7.4 Reflections

I used a number of strategies to maximise a reflexive approach throughout this research. Key to this was endeavouring to remain true to the philosophical underpinnings of dimensional analysis by being mindful of how my perspective integrated with the data and also seeking to '*find all that is involved*' (Schatzman 1991). In section 3.8 in chapter 3, I describe how I managed my reflexive self. I have described in chapter 4 the many resources I used to inform my thinking and how I undertook an audit trail of my methodological decisions to assure credibility. I found as I made memos, developed theoretical explanations and hypotheses my perspectives shifted. My thinking ebbed and flowed enabling me to view the data from different angles. I took into account my experience and used different lenses through which to view the data, such as the metaphor of music. I spent time challenging myself and considering the impact I had on the fieldwork. I used memos and my reflective diary to capture this and then adjust my stance for the next round of data collection and writing. I recognised my initial perspective was as a critical care outreach nurse. I needed to shift that perspective and worked to see the familiar as strange. I did this using the metaphor of music as a conceptual lens which enabled my abductive thinking, 'to-ing and fro-ing' through the interview and focus group data, memos and array of images, pictures and photos to see the familiar as strange.

This process enabled a journey of self-discovery. I challenged myself by asking questions of the data, turning thoughts around to the opposite angle and examining the dimensions, comparing them, realigning them and developing new hypotheses to repeat the process with. Through generating memos I was able to develop concepts and build my abstract thinking. It was a fluid approach that allowed me to create the explanatory matrices and adjust the dimensions, always seeking more

and looking deeper. This was an incredibly creative and stimulating process that developed my abilities to think conceptually.

7.4.1 Dissemination of Findings

Throughout the research process different aspects of the study, such as methodological debates around examining decision-making, reflections on the research process and the study's findings have been presented every year at the University of Brighton's Doctoral student conferences (2006 – 2011). This offered valuable peer review that influenced me in the development, shaping and refining of the study as it progressed. The study findings were also presented at three international conferences as detailed below:

- Presented at the SUADE Conference, University of Brighton, April 2009 entitled - *The Ethical Review: Reflections from Both Sides of the Table*.
- Presented at the South Thames Intensive Care Managers' Group (STICUMUP) Conference - Fighting for Better Patient Care, 14th October 2011, Aurora Hotel, Crawley, Surrey entitled - *Decision-Making in Acute Care Nursing with Acutely Unwell Patients*.
- Presented at the British Association of Critical Care Nurses (BACCN) - 4th International Conference, 10th September 2012, Brighton Dome, Brighton, Sussex entitled - *The Theory of Mind Accounting: Decision-Making in Acute Care Nursing with Acutely Unwell Patients*.

In addition, during the research process I wrote several book chapters in a text book I co-edited on caring for critically ill patients outside of the ITU or HDU entitled '*Ward-Based Critical Care: A Guide for Health Professionals*' (Smith et al 2009). I intend to disseminate the completed

study findings and theory via further conference presentations and papers for peer reviewed journals in the future.

7.5 Summary

The motivation for this thesis stemmed from my concern for patients who suffer untimely deaths due to failures by ward staff in recognising their deterioration. These concerns were formed from my own experience as a critical care practitioner called to attend patients on the ward and discovering other deteriorating patients by chance whose condition was not yet recognised by the ward staff.

At the conclusion of this study, I heard about a young diabetic girl whose life-threatening acidosis was not recognised by acute care nurses, resulting in a delay in referral and treatment. Luckily, unlike the gentleman in chapter 1, this patient responded quickly once the ICU team had intervened and she survived this acute life threatening episode.

Mind accounting in clinical reasoning explains the way nurses assess unwell patients and the interventions they make based on their decisions. These decisions are inextricably linked to the way nurses interact with their colleagues, the complex events they face at work and the cognitive and clinical interventions that they practice during the process. The purpose of making this social process explicit is to help build salient educational programmes to equip the acute care nurses working on the ward with the skills and competencies to recognise and effectively care for deteriorating patients.

This is the first study to illuminate the modes of thinking and the cognitive justification of mind accounting that takes place when caring for a deteriorating patient in an acute care ward. It is the first study to identify the factors that affect this process collected in real time and in

the clinical practice. These previously unrecorded mechanisms within the management of acute deterioration may help to focus educational and quality initiatives to enhance nurses' clinical reasoning and performance when managing the acutely sick patient. It is hoped this explanatory theory will contribute to continuing improvements to readdress the phenomenon of failing to rescue vulnerable, acutely unwell patients.

*'What we call the beginning is often the end.
And to make an end is to make a beginning.
The end is where we start from.'*

(T.S. Eliot, 1942)

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APPENDICES

Appendix 1 - An Example of a Track and Trigger Physiological Early Warning Scoring System

	3	2	1	0	1	2	3
Breaths per min		< 9		9-19	20-29	30-39	>40
O ₂ Saturation	<85%	85-89%	90-94%	>95%			60% O ₂ or more
Heart Rate per min		< 40	40-50	51-100	101-110	111-129	130 or more
Systolic Blood Pressure	Less than 70	71-80	81-100	101-199		200 or more	
Urine output in last 2 hours	<30 mls/hr for 2 hrs	31-40 mls/hr for 2 hrs					> 250mls per hour for 2hrs
Temperature (°c)		35.0 or less		35.1-37.4	37.5-38.4	38.5 or more	
Conscious level	Unresponsive	Responds to Pain stimulus	Responds to Voice	Alert			
Pain		Unrelieved by analgesia	Severe or (7-10 out of 10)				

Instructions for Use

1. The judgement of the person at the bedside is the most important factor in the care of the critically ill.
2. Use the best score for neurological assessment but the worse in your assessment of the other categories.
3. Patients on 60% oxygen with low saturations will score twice in this category.
4. If the patient scores **3 in one category** or a **cumulative score of 5 or more**, or **you have serious concerns** about the patient for other reasons, please contact the Outreach team or the Site Practitioners and the patient's own team urgently.

The purpose of this system is to detect patients whose condition is deteriorating. When routine vital signs are recorded staff are expected to apply a score and take appropriate actions if any of the above factors are evident. It should therefore 'trigger' a response that should result in an early and timely intervention for the patient.

Appendix 2 – Summary of the Strengths and Weaknesses of the Empirical Studies reviewed in Chapter 1.

Reference	Study Description	Strengths	Weaknesses
Andrews 2004 and Andrew Waterman 2005	Both these studies are reporting the results of a grounded theory research into how nurses recognise and detect deterioration.	This was the first study to attempt to place the detection of physiological deterioration within the context of clinical practice and the difficulties faced in making a successful referral. Its strengths include a robust methodology and design that generated useful insights to this area of care.	The study relied on retrospective recall as during the fieldwork no deterioration was observed.
Athifa et al 2010	Exploratory focus groups conducted with registered nurses prior to and 6 months after the introduction of critical care outreach services to explore their perceptions of the service.	Improved communication was reported between members of the multidisciplinary teams enhancing the discharge process from ICU to the ward. The study was conducted on more than one site. This was a large multi-centre study. Chosen method captured rich data and views of the service users.	Only ward nurses' views were sought. Patients, relatives, ICU staff, medical and AHP staff may have added rich data. May not be generalisable across institutions.
Ball et al 2003	The study's objective was to determine the effect of the critical care outreach team on patient survival to discharge	This study was one of the first that statistically described the positive impact of critical care outreach	The study was based in one institution. The baseline readmission rate

Reference	Study Description	Strengths	Weaknesses
	<p>from hospital after discharge from critical care and readmission to critical care. This was a non-randomised population based study.</p>	<p>teams of patient outcomes, in this case, readmission rates.</p>	<p>into ICU was higher than the national average so this may have biased the improvements. A retrospective design where the variables were unable to be controlled. The intervention on the ward may have varied between practitioners</p>
Bellomo et al 2004	<p>A prospective controlled before and after trial exploring whether predefined adverse outcomes would decrease in patients post major surgery with the introduction of and intensive care unit-based medical emergency team.</p>	<p>The results demonstrated benefits to patients. The study compares favourably with similar work.</p>	<p>Only surgical patients studied. Only one institution. Not double-blinded, placebo-controlled, or randomised.</p>
Bristow et al 2000	<p>A prospective cohort comparison study after casemix adjustment to evaluate the effectiveness of a medical emergency team in reducing the rates of selected adverse event.</p>	<p>Findings showed significantly reduced rates of unanticipated ICU HDU admissions at the MET intervention hospital. The performance of the models used were assessed for 'goodness-of-fit'.</p>	<p>One study cannot definitively answer if the MET was the cause of the benefit observed. The calling criteria may not have been sensitive enough. There were differences in each of the hospitals studied: funding; out of hours cover; number of senior staff on duty.</p>

Reference	Study Description	Strengths	Weaknesses
Buist et al 1999	The objective of the study was to investigate the nature and duration of clinical instability (i.e. abnormalities in simple physical observations or laboratory test results) in hospital patients before a "critical event" (a cardiac arrest or unplanned admission to ICU). Retrospective survey of medical records of all patients having critical events over 12 months. Data on hospital and Intensive Care patients were obtained for comparison with the study population.	This study concurred with other work at the time identifying criteria that occurred prior to a critical event. This information informed the debate about the importance of developing ways to recognise and respond to deterioration earlier rather than later to improve clinical outcomes.	The findings are from a single site Australian institution. They are confirmatory rather than new findings. The study was retrospective in nature and relied on clinicians' professional judgement when evaluating patient records.
Buist et al 2002	A non-randomised, population based study before and after the introduction of the medical emergency team (MET). The aim of the study was to determine whether earlier intervention by the MET could reduce mortality from an unexpected cardiac arrest.	The study demonstrated a 50% reduction in the incidence of cardiac arrest. Before and after design strengthens the study. Able to control the major characteristics associated with the hospital (as opposed to comparison across different hospitals). End points of cardiac arrest call and mortality clearly definable.	Data from only one tertiary hospital in Australia. Different time points may have influenced the results if factors that had naturally altered over time had not been recognised. The Hawthorne effect of the MET may have influenced results and the high profile nature of the research project. The research nurse in post may have inadvertently improved the management of patients with clinical instability.

Reference	Study Description	Strengths	Weaknesses
Chaplik & Neafsey 1998	This study retrospectively attempted to identify key variables that lead to a cardiac arrest so that nurses could recognise their occurrence and prevent further deterioration.	This study adds to the body of knowledge around physiological variables that precede deterioration and concurs with similar studies.	Retrospective in design. Relied on the accuracy of note-keeping and the judgement of the reviewers.
Chellel et al 2006	This paper reports on an evaluation of the role and contribution of outreach in the management of the critically ill ward patient. Interviews with outreach nurses and other professionals were used to collect data.	The study revealed the complexity of the outreach service. It showed insights into the world of acute care and highlighted where improvements may be required.	This study was based only in 2 hospitals within UK. It proposes a need to consider nurse and medical training to prepare staff for this work.
Cioffi et al 2009	An exploratory descriptive study using interviews with a purposive sample of 17 nurses to identify cues of potential deterioration nurses used to recognise a patient of concern who is not meeting the calling criteria.	Ten changes of concern were identified that may assist nurses to detect patients at possible risk. Two of these are newly identified	Retrospective approach. Only experienced nurses interviewed who may already be familiar with clinical deterioration in the early stages. No other professions included.
Cioffi et al 2010	This study explored the validity of the criterion 'changes of concern' used by nurses call emergency response teams using a questionnaire. Data were summarised using descriptive statistics.	Assessment underpinned by changes of concern can provide more complete information for clinicians to recognise possible early deterioration. This may guide continuing debate and evidence be used to improve the care of deteriorating patients.	The study is limited as it has only addressed a group of indicators some nurses used to identify patients they are concerned about. Nurses were the only sample set. Other health professionals need to be involved in further

Reference	Study Description	Strengths	Weaknesses
			identification and validation of indicators.
Cooper et al 2010	A study using mixed methods. 51 final-years student nurses attended a simulation laboratory. Students completed a knowledge questionnaire and two video-recorded simulated scenarios (mannequin based) to assess skill performance.	Robust design and methodology The scenarios simulated deteriorating patients with hypovolaemic and septic shock. Simulation is very near to the real world. Relevant to practice.	Set in Australia, so findings may not be comparable with UK settings. Simulation cannot replace reality. Reality is not completely realised simulation
Daffurn et al 2004	Questionnaires were used to determine registered nurses' opinions and knowledge and use of the medical emergency team system.	The study gave insight in to how well nurses may use the MET system. It offers suggestions on what teams may need to consider as they develop METs.	The sample size is small and give only a snapshot of one group of nurses. Not generalisable.
Daly et al 2001	Using logistic regression analyses and modelling data from patients who were discharged from intensive care units, a predictive model to triage patients for discharge to reduce mortality after discharge developed.	Robust design and methodology. Large sample size across many UK ICUs. Results identify patients at risk from inappropriate discharge from ICU which may aid decision-making for clinicians.	The benefits of the model rely on specific ICU computer programme that is now not commonly used.

Reference	Study Description	Strengths	Weaknesses
DeVita et al 2004	A retrospective analysis of mortality and cardiac arrests before and after the increased use of the medical emergency team (MET).	Large study with a large sample size. Findings are beneficial to clinical care suggesting MET use may positively improve clinical outcomes in the deteriorating patient.	Observational study so may have confounding factors that influence the results. Changes in care contemporaneous to increased MET use may have been influential. Retrospective nature of the study makes it difficult to exclude hidden biases. May be applicable to US health care systems only.
Endacott et al 2007	Mixed methods case study design. Aim to identify the cues that ward nurses and doctors used to identify patient deterioration. To examine the assessment and communication of deterioration in patients on acute wards in a regional hospital in Australia.	Important implications for the support of junior staff identified. The importance of effective referral and communication was identified. The study identifies important patient safety issues. Relevant to practice.	The study may not be generalisable to other settings. Single site study.
Fernandez & Griffiths 2005	The objective of this study was to compare the safety and efficacy of the current standard practice for monitoring postoperative observations in one hospital with an	The results of the study have implications for clinicians on the diligence of vital sign recording as part of postoperative care.	The sample size is small of one setting. Potential confounders include the type of surgery, type of

Reference	Study Description	Strengths	Weaknesses
	<p>experimental protocol that comprised more frequent monitoring. A randomised controlled trial.</p>		<p>anaesthesia and ASA classification. The findings are only applicable to this population of patients.</p>
Franklin & Matthew 1994	<p>A review of consecutive patients over a 20 month period who had suffered an in-hospital cardiac arrest to determine the frequency of premonitory signs prior to the cardiac arrest; any patterns in nurse/physician responses to these signs and symptoms; whether cardiac arrests occur more frequently in patients discharged from the medical ICU than in other patients.</p>	<p>The findings contributed to the debate at the time around inaction of staff when a patient deteriorates.</p>	<p>One institution in the US No new data or insights were found that had not already been published. Confirmatory rather than new insights.</p>
Gao et al 2007	<p>A multicentre interrupted time-series analysis the impact of critical care outreach services in England.</p>	<p>Over 350 000 admissions were used in the study sample. 108 ICUs were sampled. This allowed for adequate statistical power. The multicentre time-series approach helps to establish consistency, specificity and temporal relationships.</p>	<p>The observational nature of the study limits its ability to infer causality. But due to the widespread teams a RCT was then infeasible. The variations in the way critical care outreach services have been implemented decreased the ability to analyse and understand impact.</p>

Reference	Study Description	Strengths	Weaknesses
Goldhill & McNarry 2004	The vital sign data was collected on 433 adult non-obstetric patients to identify high-risk hospital patients in a London teaching hospital.	The study demonstrated that an opportunity exists to intervene and improve outcomes for high-risk patients who may deteriorate.	Data may have been subject to measurement and recording error Definition of physiological abnormality was subjective.
Goldhill & Sumner 1998	A 6-month study exploring the impact of a critical care outreach team reviewing patients who the wards have referred using calling criteria was carried out.	The study showed a significant reduction in cardiac arrest calls in patients reviewed by the team. It also suggested those criteria amenable to identifying deterioration early on the wards. This study was key in contributing to the development of the track and trigger systems currently in place on wards in the UK.	The study was one team in one London teaching hospital. The specific arrangements of services in this hospital may have influenced the findings and may not, therefore be generalisable to other institutions.
Goldhill et al 1999	Physiological values and interventions in the 24 hours prior to entry to the ICU were collected prospectively for admissions from hospital wards. The aim was to describe the reasons for admission and to identify physiological values and interventions likely to be associated with patient at risk.	The data obtained from this study and others by Goldhill and colleagues informed the development of the track and trigger scoring systems widely used today.	The study only used data from patients referred to and admitted to the ICU. This leaves a large number of patients who we do not know about. One institution – a large teaching hospital.

Reference	Study Description	Strengths	Weaknesses
Goldhill et al 1999a	<p>The implementation of the 'Patient at Risk' Team was evaluated demonstrating a reduction in cardiac arrest calls and mortality rates.</p> <p>This study is part of a series looking at different aspects of the care of the deteriorating patient and the impact of early intervention by critical care experts.</p>	<p>As part of the series of studies this study added to the body of knowledge beginning to show the efficacy of critical care experts reviewing patients in the ward areas. It was a key study in the development of the critical care outreach service.</p>	<p>The study was carried out in one large London teaching hospital. The findings may not therefore be transferable or generalisable.</p>
Hillman et al 1996	<p>A review of medical records was undertaken to determine the incidence of antecedent factors leading to hospital inpatient cardiorespiratory arrests.</p>	<p>1027 charts reviewed. The signs identified mirror other studies contributing to the early body of knowledge on recognition and response to the deteriorating patient.</p>	<p>One institution. Retrospective review. Five researchers who may have interpreted the data differently. Dependent on the standard of note-keeping.</p>
Hillman et al 2001	<p>This study aimed to document antecedent factors in hospital deaths in an attempt to identify potentially preventative factors. Demographics of all deaths were recorded over a 6-month period as well as antecedent factors present within 0–8 and 8–48 hours of all deaths including vital sign abnormalities, cardiorespiratory arrests and admission to intensive care.</p>	<p>The study contributed to the debate around late recognition of the deteriorating patient. It showed that there is a high incidence of serious vital sign abnormalities in the period before potentially preventable hospital deaths. These antecedents may identify patients who would benefit from earlier intervention.</p>	<p>A retrospective study relying on the professional judgement of the researchers reviewing patients' notes after the event. The study was dependent on accurate note-keeping. Based in one institution in Australia.</p>

Reference	Study Description	Strengths	Weaknesses
Kinsman et al 2009	<p>This study aimed to investigate the relationship between knowledge, skill performance and situation awareness in a simulated environment.</p> <p>51 student nurses were invited to attend a simulation laboratory for 1.5 hours. Participants completed a knowledge questionnaire and two video recorded simulated scenarios to assess skill performance. The scenarios simulated deteriorating patients with hypovolaemic and septic shock.</p> <p>Situational awareness was measured by stopping each scenario at a random time and asking a series of questions relating to the situation. Video review with a clinical expert was undertaken to facilitate participant reflection.</p>	<p>Relevant findings to practice were suggested.</p> <p>Knowledge scores suggested, on average, a satisfactory academic preparation</p> <p>There were significant deficits in students' ability to manage patient deterioration.</p> <p>The need for a systematic approach to patient assessment (such as primary and secondary survey) to be embedded in nursing curricular was highlighted.</p> <p>Simulation techniques appear to be a good way of assessing skill and situation awareness and may improve performance when integrated into curricula.</p>	<p>Simulation cannot replace the real clinical environment and its complexity and team approach. It is possible that the findings relate only to the Australian student nurse population.</p>
Lee et al 1998	<p>This study examined the risk factors of early postoperative emergencies that required an intensive care team Intervention.</p> <p>The design comprised a matched nested case-control study (34 cases and 126 controls).</p>	<p>The study highlighted the need for high dependency units to manage the risk of early post-operative complications.</p> <p>At the time of publication this was a key study that contributed to the UK debate and political policy</p>	<p>Set in an Australian institution. Retrospective note reviews relying on the accuracy of note-keeping.</p> <p>The study concludes that more evaluation is required.</p>

Reference	Study Description	Strengths	Weaknesses
		change to increase critical care funding.	
Ludikhuizen et al 2012	A cross-sectional study using interviews that aimed to describe how nurses and physicians judge their own quality of care for deteriorating patients on medical wards compared to independent experts.	This study demonstrated that the concept 'failure to rescue' was still prevalent despite the critical care support that has been put in place. There was a high response rate of participants who had cared for the patients 12 hours prior to the adverse event eliciting rich interview data. Improving critical self-assessment may enhance the care of the deteriorating patient.	The use of an expert panel may have introduced some bias and may have over or under estimated the presence of delay in recognition. Selective recall of the care providers may be present as the median interview time after the event was 13 days. A Dutch study set in one institution.
McGloin et al 1999	A six-month audit in a London teaching hospital that reviewed patient notes to determine the incidence of unexpected deaths on the wards and whether they were avoidable; and to assess the quality of care on the wards prior to ICU admission.	This audit added to the body of knowledge around suboptimal care on the wards with the deteriorating patient. The identification of avoidable deaths and what should have taken place contributed to the debate and guidance now general practice in hospitals in the UK.	This study was retrospective in nature and relied on the clinical judgement of the researchers to determine the results and recommendations. Data collection was dependent on the quality of the note-keeping. It represents just one institution in London.

Reference	Study Description	Strengths	Weaknesses
McQuillan et al 1998	<p>Examined the prevalence, nature, causes and consequences of suboptimal care before admission to ICUs and suggested possible solutions.</p> <p>A prospective confidential enquiry on the basis of structured interviews and questionnaires. The quality of care of 50 consecutive adult emergency patients prior to their ICU admission in 2 UK centres.</p>	<p>The study identified a range of factors that resulted in suboptimal care. These factors are still acknowledged today and considered key in improving the care of the critically ill. This study was the start of the deteriorating patient recommendations and developments.</p>	<p>The study lacked statistical significance in some areas. Lead time bias may have been present in some cases. Relied on assessor judgement – potential for error or bias. Agreement between the assessor moderate. No objective definition of suboptimal care given. Input from other professions to the clinical care not considered.</p>
Mohammed et al 2009	<p>To determine if the provision of computer-aided scoring could increase the accuracy and efficiency of early warning scoring (EWS) calculations when compared to traditional pen and paper methods.</p>	<p>The study demonstrated the value of hand-held computers in helping to improve the efficacy and efficiency of EWS.</p>	<p>The implications of the study for clinical practice needs to be addressed. The characteristics of the participants are not known nor how this may have influenced the findings.</p>
Moon et al 2011	<p>An audit to determine whether the mortality and the proportion of adult admissions to ICU following a cardiac arrest call had reduced following the introduction of a 24-hour critical outreach service and track and trigger</p>	<p>This study contributes to the body of evidence that demonstrates the efficacy of such systems by reductions in mortality and cardiac arrest calls.</p>	<p>A retrospective comparison was undertaken with the potential to miss changes in disease patterns. The two streams of patients were not parallel undergoing a single</p>

Reference	Study Description	Strengths	Weaknesses
	<p>scoring. A retrospective analysis of prospectively collected data during 2 four-year periods.</p>	<p>Large sample size with accurate patient data from the intensive care databases.</p>	<p>study intervention in a clinical trial that the researchers were blinded to. The cardiac arrest calls were only those logged by switchboard, no record exists of false alarms, or those managed without a call to switchboard. The impact of 'Not for Resuscitation' orders was not factored in.</p>
Rivers et al 2001	<p>The evaluation of early goal-directed therapy before admission to the ICU. A prospective randomised study.</p>	<p>The findings of this study have been embedded in practice, accepted by critical care experts and supported by international sepsis protocols that have improved mortality rates in patients with severe sepsis and septic shock.</p>	<p>In an open randomised partially blinded trial there are unavoidable interactions during the initial period of the study. Patients in the standard-therapy group may have received some form of goal-directed therapy, reducing the treatment effect.</p>
Russell 1999	<p>The study aimed to determine factors that contributed to readmissions to the intensive care unit (ICU) from the general wards in an Australian hospital over a 6 month period. The design was prospective, descriptive,</p>	<p>This study contributed to the body of work at the time exploring antecedents and indicators that result in an intensive care readmission.</p>	<p>Single institution. The design of the study did not explore why these readmissions occurred.</p>

Reference	Study Description	Strengths	Weaknesses
	qualitative, and quantitative.	The study concurred with the thinking at the time around inadequate follow-up care on the general wards.	
Priestly et al 2004	A pragmatic ward-randomised trial design where intervention of critical care outreach was introduced to wards in sequence. Outcome measures were in-hospital mortality and length of stay.	Strong methodology using a randomised design. Important findings on the benefits of critical care support to the wards	In order to have had high enough statistical validity a large number of hospitals would have needed to participate. Confidence intervals were wide. No blinding was possible.
Prytherch et al 2006	The comparison of the speed and accuracy of manually charting the vital signs and calculating the track and trigger score with an electronic device.	First study to describe these findings. Important implications on potential human error that may impact on a deteriorating patient.	One site study using one device. Classroom based study which may limit the conclusions drawn.
Schein et al 1990	The study of 64 consecutive patients who suffered cardiac arrest to determine common clinical features prior to the event.	This study was one of the first to describe and highlight clinical antecedents and their relevance to the management of the deteriorating patient. It is a key publication in the setting up and development of the patient at risk agendas.	This study acts as an initial step to answering the questions around the deteriorating patient at the time. The sample size is small. It reflects the practice in one institution. It required a level of subjectivity

Reference	Study Description	Strengths	Weaknesses
			in the clinical judgement of the researchers and examines one cohort of patients only.
Shearer et al 2012	<p>A point prevalence audit to determine the incidence of abnormal vital signs and the activation of the Rapid Response System (RRS)</p> <p>A prospective audit of all patients experiencing a cardiac arrest, unplanned intensive care unit admission or death over an 8-week period;</p> <p>Structured interviews of staff to explore cognitive and sociocultural barriers to activating the RRS.</p>	Highlighted the continued failure to respond thereby enabling improvements to be implemented.	<p>Low number of interviews</p> <p>Data potentially contaminated by the knowledge in part that the patients had suffered an adverse event.</p> <p>Single organisation.</p>
Smith 2003	<p>A follow up review by a critical care nurse of ward patients recently discharged from ICU was undertaken.</p> <p>Factors such as mortality, readmission rates and incidental findings were reported.</p> <p>Mortality and readmission rates were compared to data prior to the intervention.</p>	<p>Findings suggested improved outcomes.</p> <p>Patients who had abnormal vital signs were referred and seen by the teams.</p> <p>Positive feedback from ward teams</p>	<p>The study did not demonstrate statistical significance.</p> <p>Findings were relevant to one setting in the UK only.</p>
Subbe et al 2007	An assessment of inter-rater and intra-rater reliability of 2 track and trigger scoring	Added to the body of literature developing sensitivity and	Some patient cohorts were not included.

Reference	Study Description	Strengths	Weaknesses
	systems using a prospective cohort design.	specificity of track and trigger systems. Highly skilled critical care researchers tested the tools.	Sample size may not have given reliable results. Retrospective review of notes may not have been a reliable way evaluation.
Wallis et al 1997	The aim of this study was to determine the cause of death of those patients who died on general hospital wards after discharge from an intensive care unit. Data were recorded at discharge from intensive care.	This study contributed to the debate ensuing at the time around ward care. From data recorded at discharge from intensive care over a 5 year period some of the deaths may have been preventable with further intensive care or improved care on wards.	The study relied on information on death certificates which are usually completed by pre-registration house officers. The accuracy of death certification has been questioned.

Appendix 3 – Summary of the Strengths and Weaknesses of the Empirical Studies reviewed in Chapter 2

Reference	Study Description	Strengths	Weaknesses
Aitken et al 2011	<p>The objective of the study was to describe the decisions identified using observation and ‘think aloud’ in the study of decision-making related to sedation assessment and management within the intensive care.</p> <p>The study revealed assessment and management were the most common types of sedation decision made by nurses in the study.</p>	<p>‘Think aloud’ as a method minimises different forms of interpretation as exact verbalisations are provided. Observation followed up with interviewing allowed robust interpretation of the data. Independent data collectors for each of the ‘think aloud’ and data collection method reduced bias.</p>	<p>Some participants found continuous verbalisation difficult. Observation only reveals the visible activities occurring given decision-making is a cognitive activity. This may have resulted in under-reporting of decisions. Sample size was small. The results are not generalisable. The different skills and experience of the nurses may have affected the results.</p>
Ajjawi 2007	<p>A Doctoral thesis from the University of Sydney that explored how physiotherapists learn to communicate reasoning in their practice.</p> <p>The study revealed that the efficacy of the clinical reasoning process relies on the clinician’s reasoning proficiency and the client’s capacity and willingness to participate in clinical decision-making.</p>	<p>The author developed a new model of clinical reasoning depicted as a spiral that describes growing understanding of the practitioner of the client and the problem. It is the first to describe this model of reasoning and alerts the reader to the importance of metacognition – the thinking about</p>	<p>The study is limited to the profession of physiotherapy rather than being applicable to nursing thereby limiting its generalisability. A potential weakness is that the researcher was of the same profession as the participants which may have bias the findings</p>

Reference	Study Description	Strengths	Weaknesses
		thinking.	
Benner 1984 Benner and Tanner 1987 Benner et al 1996	<p>These ethnographic studies describe a model of practice knowledge as interpreted by Dreyfus that uses different levels of practice based on experience and expertise skill acquisition.</p> <p>Benner and colleagues' position is that they argue the distinction between 'knowing how' and 'knowing that'. They describe a move from novice to expert characterised by the transition from explicit rule-governed behaviour to intuitive contextually determinate behaviour. Critical incident technique was used to elicit domains of nursing knowledge.</p>	<p>Benner's work is seminal to the nursing body of knowledge. Her theory is widely accepted, used and cited in the nursing literature. Although often challenged, Benner's work raised the notion of intuitive practice to a place of recognition and importance in subsequent studies. Nothing to date has replaced this theorist's important contribution to the nursing decision-making literature.</p>	<p>The coding team comprised an anthropologist and psychologist as well as a nurse. Expert practice being decided by non-nurses may have weakened the findings.</p> <p>The model of nursing does not acknowledge the issues of power and their influence on knowledge generation</p>
Bucknall 2000	<p>This Australian study reports the 2-hour observation of critical care nurses in the clinical setting. The purpose of the study was to observe and describe the decision-making activities of critical care nurses within natural clinical settings. Decision frequencies were linked to nurses' critical care experience, appointment level, and location, as well as nursing shifts.</p>	<p>A number of factors were identified that influence decision-making that may inform clinicians and researchers in the future. The findings supported current evidence at the time. This observational study carried out in the clinical area adds strength to the study compared to</p>	<p>Observational studies have several shortcomings. Importantly, there is potential for observational bias such as the Hawthorne effect, which elicits behavioural changes in the subjects (Seaman, 1987) or Rosenthal phenomenon of researcher bias, such as</p>

Reference	Study Description	Strengths	Weaknesses
		laboratory based research previously reported.	attitudes, emotions and personal interest, influencing the outcome.
Bucknall 2003	This study aimed to investigate environmental influences on nurses' real decisions in the critical care setting. The study comprised observations and semi-structured interviews with 18 critical care nurses.	The study described how clinical decisions were strongly influenced by the context in which the nurses were working. The study informs the clinical decision-making debate by suggesting it is important to measure the impact of contextual variables on decision-making in order to improve health care outcomes.	The study design and sampling technique inhibited transfer of the findings beyond this study population. The Hawthorne effect and Rosenthal phenomenon may have influenced the outcome.
Bucknall and Thomas 1997	This study reports a survey of 230 Australian critical care nurses in response to set of structured questions concerning various difficulties in making decisions. 56% of the respondents reported experiencing difficulties on a weekly or more frequent basis.	The study gave insight into some of the difficulties nurses experienced when making decisions. This allowed an opportunity to address those areas improve their experience within this context.	The authors concluded that further exploration using in-depth interviews is required to understand the issues and themes found in this research.
Carnevali et al 1984 Carnevali and Thomas 19	Carnevali and colleagues wrote extensively about nurses' decision-making. The developed the seven-stage linear	The seven-stage linear model is widely referred to and used in research and reviews of decision-	A criticism of this model is its linear nature and the fact that it doesn't not appear to account

Reference	Study Description	Strengths	Weaknesses
	<p>model that built on the seminal work of Elstein and colleagues. These authors discuss the way nurses cluster and 'chunk' cues to help them build a picture of the clinical scenario as they make their decisions or judgements.</p>	<p>making models. It resonates with clinical practice and it refers to nursing practice observed and evaluated in practice.</p>	<p>for the complexities of real world clinical practice. Contextual factors such as team dynamics, the urgency of the decision, the specialty in which the decision is being made are not fully accounted for.</p>
Cioffi 2000	<p>This descriptive study explored the experiences of Registered Nurses when making decisions to call emergency assistance to their patients. The study used unstructured interviews.</p>	<p>These experiences have not been described before. The study contributes to the body of knowledge revealing the use of feelings that something is wrong rather than empirical evidence. Knowledge of the patient and prior experience were cited as key. The importance of not devaluing concerns is important.</p>	<p>Although the study captures nurses' experiences of calling emergency assistance, it does not take into account the specific details of the medical emergency teams and the clinical details of the cases that the calls were made for. The study relied on subjective data to recognise patients in the early stages of deterioration. An interpretative study that may not be able to be generalisable.</p>
Cooper et al 2012	<p>In a simulated setting the researchers' objective was to assess student midwives' ability to assess, and manage maternal</p>	<p>This study contributed to the emerging evidence around 'failure to rescue' in a different group of</p>	<p>The study is limited by the small sample size. The sample was predominantly</p>

Reference	Study Description	Strengths	Weaknesses
	deterioration using measures of knowledge, situation awareness and skill, performance. The participants completed a knowledge questionnaire and two video-recorded simulated scenarios.	staff. Its findings have important implications for the education, support and training of student midwives in Australia.	white Caucasian Australian students from a single region in Australia. The authors state that further work is required to develop the rigor of clinical assessment.
Currey and Botti 2006	The aim of this study was to describe variability of nurses' haemodynamic decision-making in the 2-hour period after cardiac surgery as a function of interplay between decision complexity, nurses' levels of experience, and the support provided. Data were collected using non-participant observation and a follow-up interview. Two factors specifically influenced decision-making quality: utilisation of evidence for practice and the experience of the nurses and their colleagues.	The findings have important implications for skillmix arrangements, post-operative patient management and nurses' professional development and education requirements.	The findings are not generalisable. There requires further exploration to identify modifiable sources of variability of decision-making that may impact on patient outcomes.
Elstein et al 1978 Doubilet and McNeil 1988 Fischhoff and Beyth-Marc 1988	These authors were the early researchers of decision-making and clinical judgement. Their work described the hypothetico-deductive models commonly referred to today. Their studies were laboratory based, used	The theories these seminal authors presented to the body of knowledge are what researchers since have built on. Their theories have relevance today although are constantly being refined and	None of the studies were with the nursing profession. Many were in simulation and not in the clinical area. They were largely quantitative in design thereby not capturing the

Reference	Study Description	Strengths	Weaknesses
	simulation and complex mathematical models to examine the decision-making processes used by the medical profession in the 1970s and 1980s	developed as practice moves forward.	cognition in play with decision-making. More recent research has built on these theories developing their findings.
Forneris and Peden-McAl 2007	Using a small case study of 6 students/preceptors in the USA the study aimed to determine if a reflective contextual intervention would improve nurses' critical thinking skills during the first 6 months of their practice. The participants kept a journal undertook interviews and attended discussion workshops. The authors found that development of the contextual and reflective nature of critical thinking took place.	The study shows that this reflective contextual intervention offered an educational element to their practice. It enabled greater criticality to their practice which may be important to novice nurses. This may be a model of clinical learning that others can consider.	The study was an intensive examination of an intervention in one institution. Others may yield different results. These findings are not generalisable.
Franklin et al 2011	The goal of this research was to develop a taxonomy that elucidated the types of decisions made by physicians as they balance situational factors, system-wide decisions and the care of individual patients. The study used grounded theory. It comprised observations of 5 physicians for 4-8 hours during a shift in an Emergency	These findings suggested that the implementation of information displays (i.e. clinical dashboards) may allow physicians to better manage both immediate/intermediate goals as well as longer term planning through greater awareness of over	The findings are not generalisable as they relate to physicians only and ED working

Reference	Study Description	Strengths	Weaknesses
	<p>Department using 'think aloud' narration. The findings were that physicians focused on task transition, when selecting pending goals as opposed to pure patient treatment.</p>	<p>all needs. This has implications on practice. The study gives an insight to medical decision-making in an ED.</p>	
Gerdzt and Bucknall 2001	<p>A survey of 172 Australian triage nurses was undertaken to describe their scope of practice, educational background and to explore the self-reported influences perceived to impact on their decision-making. The survey results reveal variability in the educational requirements for nurses to triage. Additionally, substantial inter-respondent variations in nurses' self-reported participation in a range of decisions to expedite emergency care were identified. Analysis revealed significant associations between demographic characteristics of the triage service, levels of nurse autonomy and the nurses' self-reported participation in a number of triage decisions.</p>	<p>The findings of this study have implications for emergency nurse education and the development and evaluation of triage practice guidelines. The study gave insight to the types of decisions and frequency of decision-making with an Emergency Department.</p>	<p>The study did not illuminate rationale for decisions made or whether those decisions were good decisions or not. The study is not generalisable to other clinical areas. Participants may have under or over-estimated their participation in decision-making. Additionally, some of the issues raised around autonomy in this paper may relate to the nurses' view of what constitutes a triage decision. This may have influenced nurses' reports of the participation.</p>
Hamm 1988	<p>Cognitive Continuum Theory These characteristics of a particular task</p>	<p>May guide practitioners in how they may best make a decision in</p>	<p>The model does not address the quality of the decision.</p>

Reference	Study Description	Strengths	Weaknesses
	induce a particular mode of cognition in the decision maker along a continuum.	order to get the best result	There may be flaws in the intuitive judgement of the decision-maker resulting in a wrong decision.
Hancock and Easen 2006	<p>This ethnographic study examined the decision-making of nurses when extubating patients following cardiac surgery. Participant observation and semi-structured interviews were conducted over an 18 month period within a cardiothoracic intensive care unit in the UK.</p> <p>The study revealed a complex process of decision-making where factors other than best evidence were significant in the nurses' decision-making. These factors included relationships, hierarchy, power, leadership, education, experience and responsibility.</p>	<p>The study revealed critical contextual and individual issues that impact on decision-making. The study brought into question the linear decision-making models presented in the literature. These factors have important implications for policy makers, educators, managers and clinicians and for the continued professional development of nursing.</p>	<p>This study may only be applicable to the setting and speciality in which it was conducted. The authors acknowledge the methodological issue of imposing order on qualitative data that remained problematic for them. They also acknowledge their influence on the data collection and analysis.</p>
Hancock and Durham 2007	The decision-making process of a critical care consultant nurse is analysed through a collaborative reflective account of a case study. The practitioner's thinking is described and compared to existing decision-making theories.	<p>The paper makes visible the nurse consultant's thought processes and actions as the case proceeds. This may be helpful to other practitioners when faced with similar clinical scenarios. The application of a number of</p>	The paper is limited to one person of one speciality in a single clinical situation. This may affect its applicability to other settings and scenarios.

Reference	Study Description	Strengths	Weaknesses
		decision-making theories are made explicit and may aid learning and enhance practice.	
Hoffman et al 2004	The study investigated the contextual factors influencing clinical decision-making. Its aim was to determine relationships between occupational orientation, educational level, experience, area of practice, level of appointment, age and clinical decision-making in Australian nurses. Valuing their role was the most significant predictor. A model describing variability was developed.	The findings contrasted to other studies as education level and experience were not found to influence decision-making strongly. Implications on practice were identified through education requirements to enable student nurses and registered nurses to develop a professional outlook given that value of role was the most significant predictor	Generalisability may have been affected given that the study was undertaken with a sample from one area health service only. The sample size was smaller than required for power calculation. A convenience sample was used rather than a random sample thereby limiting the value of the study. The model developed only accounted for a low amount of variability in decision-making.
Kataoka-Yahiro and Saylor 1995	These authors proposed a Critical Thinking Model for Nursing Judgment, which specifies five components: specific knowledge base, experience, competencies attitudes, and standards. The model has three levels of critical thinking: basic,	The model may provide a basis for future research and educational strategies. The components and levels can be used by researchers to develop reliable and valid instruments, operationalise	Further discussion of the model is essential to facilitate the understanding of the critical thinking process. The authors do not provide evidence of the model in

Reference	Study Description	Strengths	Weaknesses
	<p>complex, and commitment. It provides a definition and conceptualization of critical thinking based on a review of the literature and input from nurses and nurse educators. model provides a first step for development of further research and educational strategies to promote critical thinking as an essential part of autonomous, excellent nursing practice.</p> <p>The model was presented to focus groups for critique of face validity.</p>	<p>definitions, and examine relationships within the model. In addition, the model may provide nurse educators with a framework for developing teaching strategies and assessing students' potential for critical thinking. This conceptualisation lays a foundation for nurses and nurse educators to promote critical thinking abilities within nursing.</p>	<p>practice, it remained theoretical.</p>
King and Macleod Clark 2	<p>The aim of this study was to explore and identify nurses' clinical expertise in surgical ward and intensive care settings in England. Its objective was to explore these nurses' understanding and use of intuition in the context of their practice. Nonparticipant observation and semi-structured interviews were used.</p> <p>The findings highlighted the most fluent and effective use of intuitive and analytical components of decision-making was found in the expert group.</p>	<p>The findings added to the steadily growing body of knowledge at the time around the integral nature of intuitive feelings in decision-making. It heightened the importance of intuition and that it enhances logical thought and therefore should be responded to and not ignored in practice. There may be a benefit for skilled experienced nurses to share their thoughts during decision-making with less experienced nurses to enable them to learn.</p>	<p>The study findings are limited to the time and place in which they took place. The potential to explore each nurses' expertise and use of intuition over time was restricted by this process and the study might have benefitted from a more longitudinal research approach.</p>

Reference	Study Description	Strengths	Weaknesses
McCallum et al 2011	<p>The aim of this study was to explore nursing students' decision-making skills through the use of a 3D virtual environment using Avatars. A convenience sample of five third year student nurses entered a simulated world environment where they cared for six patients over 1 hour. Following the activity the students were encouraged to reflect on their experience through a one to one, semi-structured, tape-recorded interview.</p>	<p>Simulation as a method allows the researchers to manipulate the scenario in order to ensure an appropriate clinical situation. The study concurred with a variety decision-making theories thereby adding to the body of knowledge on the strategies nurses use and the types of decisions they make.</p>	<p>Simulation is not the real clinical arena, so therefore may not depict reality. The participants had to type their conversations rather than verbalise them which may have caused a barrier to revealing everything that they were considering as they made their decisions.</p>
Martin 1999	<p>This study explored the influences on clinical judgement of nurses in a mental health setting using grounded theory. Two periods of participant observation were undertaken. Interviews were carried out with 15 participants and from these a questionnaire was developed which was distributed to 180 mental health nurses. The findings indicated that clinical judgements made by mental health nurses are time and situation dependent and consequently are unique.</p>	<p>This study contributed to the body of knowledge around approaches used when making clinical judgements. A matrix was proposed to conceptualise the findings and accords with the observations of other researchers at the time. Implications for practice are evident in the findings and relate to nursing curricula and enabling students to explore the basis of clinical judgements to become more self-aware.</p>	<p>The findings do not offer the answers and the matrix model of clinical judgement is irreducible in that it does not offer a 'kit' from which practitioners can construct 'good' clinical judgements. The observations in practice are not presented. Further exploration is required.</p>

Reference	Study Description	Strengths	Weaknesses
Minick and Harvey 2003	The primary focus of this study was to describe the phenomenon of early problem recognition among medical-surgical nurses. The authors used groups of 2 – 4 nurses who were asked to describe a patient-care experience in which they felt they had recognised a patient problem early. The importance of knowing the patient was a key theme and knowing when something was not as expected based on previous experience was also revealed as a theme.	This study revealed another perspective of nurses' decision-making that may help us to understand what may promote early and timely recognition of changes in a patient's condition. This may lead to safer care.	This is a very small study and not generalisable to other settings. It does not reveal anything new but does add to the knowledge base that was already evolving at this time.
Pyles and Stern 1983	This study explored how critical care nurses determine if a patient is developing cardiogenic shock. It examined what assessment and decision-making processes they used, and how they learn them. In-depth interviews were conducted with 28 critical care nurses during a study that investigated the practice of critical care nurses in the early detection and prevention of cardiogenic shock in patients with acute myocardial infarction.	The study developed the 'Gray Gorilla Theory' and described the cognitive processes used by critical care nurses. The study highlighted the importance of mentoring which has important implications for education and nursing supervision and practice.	The study examined only critical care nurses who have a very different training and skill set to general nurses. It also only focused only on decisions around patients suffering a heart attack, so may be limited in its generalisability.
Ramezani-Badr et al 2009	This qualitative descriptive study aimed to explore the reasoning strategies and	The study offered deeper understanding of how nurses made	This study was not intended to be generalisable, but can only

Reference	Study Description	Strengths	Weaknesses
	<p>criteria for clinical decision-making by Iranian critical care nurses. These included intuition, recognising similar situations and hypothesis testing. The cause for using different strategies was unclear but may have related to previous experiences, professional relationships and the kinds of decisions.</p>	<p>decisions in the critical care unit. This provided useful information to facilitate making more efficient decisions as well as promoting the outcomes of independent and collaborative nursing care interventions.</p>	<p>be considered in the context and setting it was conducted in. The culture of Iranian working may have posed limitations on the ability to explore deeply the decision-making processes as Iranian nurses do not make the final decisions on patients; the medical staff undertake this.</p>
Ratray et al 2011	<p>The primary objective of the study was to determine which professional, situational and patient characteristics predict nurses' judgements of patient acuity and likelihood of referral for further review. A secondary aim was to test the feasibility of the factorial survey method in an acute area. Participants were registered nurses working in acute areas excluding intensive care and theatre. Ninety nine participants responded resulting in 1940 completed vignettes.</p>	<p>This study has several implications for practice. The emergence of an early warning scoring system as a significant individual predictor supports the use of such systems. Educational provision might focus not just on knowledge acquisition but include educational delivery methods that incorporate or mimic real-ward settings.</p>	<p>Recruitment from a single NHS organisation limits the generalisability of the findings. There was also a poor response rate that may have resulted in a sample bias. Furthermore, there were several initiatives within the NHS Board participating in this study that might have contributed to these findings with both pre- and post-registration programmes in place.</p>

Reference	Study Description	Strengths	Weaknesses
Reischman and Yarandi 2	<p>The critical care cardiovascular (CCCV) nursing diagnostic expertise was the focus of this research. The purpose of the study was to compare diagnostic cue utilisation between expert and novice CCCV nurses. Five CCCV written simulations served as instruments in the study.</p> <p>Diagnostic content areas included left ventricular dysfunction, cardiac tamponade, sepsis, right ventricular failure, and hypovolemia related to internal abdominal haemorrhage. The sample was composed of 23 expert and 23 novice nurses. After reading each simulation, participants were asked to verbally recall the simulation, give an impression of the predominant problem or diagnosis, and give a diagnostic explanation. Verbal recalls were audio-taped for protocol analysis. Experts recalled a higher proportion of highly relevant cues than novice nurses.</p>	<p>This study gives insight into how differently experienced nurses used cues when making decisions. It supports the theories that were being published at the time adding to that body of knowledge.</p>	<p>Methodological limitations included lack of established criteria for defining novice and the expert participants and the use of a small and non-random sample.</p> <p>Further, because expertise is influenced heavily by experience, it would have been helpful in interpreting ambiguous results to know whether participants had specific experience with the types of clinical problems presented. How common encounters with these types of clinical problems were for these specific participants may have been valuable information.</p>
Scholes and Moore 1997	<p>Using video recording and observational techniques in the intensive care environment, this study explored the way</p>	<p>This study revealed new insights into how intensive care nurses think they use intuition when</p>	<p>The study findings are limited to the critical care environment and to the UK.</p>

Reference	Study Description	Strengths	Weaknesses
	<p>intensive care nurses interacted with their environment as they cared for the critically ill patient. It explored how they gathered information about the patient in order to undertake the required care.</p>	<p>caring for a patient but in actual fact do not. It described a number of concepts that are still referred to today contributing to the body of literature around the cognition of nurses in the critical care environment. This offers the opportunity to consider how best to help nurses recognise these aspects of thinking to improve patient care further.</p>	
Shin et al 2006	<p>A longitudinal design was used in this study to investigate the critical thinking disposition of students enrolled in a baccalaureate nursing programme at a University in Korea. The California Critical Thinking Disposition Inventory was administered to measure disposition to critical thinking using a questionnaire administered four times per participant.</p>	<p>Insight into how critical thinking disposition improved statistically significantly as students progressed to the next academic year. This concurred with other studies. The findings inform the debate that teaching critical thinking skills is an important component of nurse training and education and should be nurtured.</p>	<p>The use of a convenience sample limits the ability to generalise the results. The authors recognise that Korean culture may have influenced the results in that there is less opportunity to critically question and demonstrate conflicting views. A research instrument that reflects the cultural characteristics of Korea is</p>

Reference	Study Description	Strengths	Weaknesses
			recommended by the authors.
Smith 1987	This is a phenomenological study that examined the decision-making of a nurse caring for a deteriorating patient. The findings demonstrated that the practitioner used published decision-making theories of that time.	The study contributed to the building of a body of knowledge at that time and was one of the first published works in the nursing press in the UK that examined these processes.	The study comprised one participant who was in a senior position. It presents itself more of a story than a research piece.
Smith et al 2007	<p>This study asked: What factors influence the decision making of cardiorespiratory physiotherapists in acute care? How do cardiorespiratory physiotherapists manage multiple factors in their decision making? Data were collected using observations and semi structured interviews.</p> <p>14 participants each observed for 2 separate days (5-8 hrs) and interviewed. Decision-making was identified as a dynamic, complex, and multidimensional process influenced by multiple factors. Three types of factors were identified by the participants:</p> <ol style="list-style-type: none"> 1. Factors related to the nature of the decision itself 2. Factors related to the context in which the decision occurred 	This study revealed that clinical decision making by the cardiorespiratory physiotherapists involved in this study was influenced by multiple factors related to the physiotherapist and to the nature and context of the decision. The findings support the growing understanding that clinical reasoning is a complex and multidimensional phenomenon that is contextually dependent and task dependent. The nature of factors influencing decision making in cardiorespiratory physiotherapy practice and how physiotherapists manage these multiple factors has not been described previously.	The findings from this study represent the words and actions of fourteen physiotherapists working in three metropolitan hospitals in Australia. Due to the nature of qualitative research, these findings cannot be generalised to a wider population; readers need to determine the extent to which the findings are transferable to their own setting.

Reference	Study Description	Strengths	Weaknesses
	<p>3. Factors related to the Physiotherapists themselves.</p> <p>The study revealed the impact of experience on ease of decision-making.</p>		
<p>Thompson et al 2000 (full report) Thompson et al 2001 (published paper)</p>	<p>The study aimed to examine those sources of information which nurses found useful for reducing the uncertainty associated with the clinical decisions.</p> <p>Cross-case analysis involving qualitative interviews, observation, documentary audit and Q methodological modelling of shared subjectivities amongst nurses was used. The case sites were three large acute hospitals in the north of England, One hundred and eight nurses were interviewed, 61 of whom were also observed for a total of 180 hours and 122 nurses were involved in the Q modelling exercise.</p> <p>Despite isolating four significantly different perspectives on what sources were useful for clinical decision-making, it was human sources of information for practice that were overwhelmingly perceived as the most useful in reducing the clinical uncertainties</p>	<p>The findings of this study have important implications for practice in that it revealed it was not research knowledge <i>per se</i> that influenced clinical decisions, but the medium in which the knowledge is delivered such as entrusted clinical credible colleagues.</p> <p>Based on these findings, it would appear that the challenge for policy makers, practice developers, educationalists and researchers is either to give nurses the skills, resources and motivation to make information technologies more useful or to explore alternative ways of presenting quality research information ± possibly by harnessing the power</p>	<p>This study is applicable to this group of nurses. The authors have since explored the phenomenon in the primary care setting to test out their theory and make comparisons. The MEWS Score does not constitute a wholly accurate predictor of critical events. Thus, possibility exists that nurses' judgements, while not corresponding with the MEWS predicted state, may nevertheless prove accurate in clinical practice.</p> <p>It is reasonable to ask if the simulated cases reliably captured the weightings of the nurses. Judgement tasks that rely heavily on perceptual or sensory information cues (such</p>

Reference	Study Description	Strengths	Weaknesses
	of nurse decision-makers.	of those who embody the clinical specialist or nurse consultant role.	as touch, colour or smell) may not be well served via paper based scenarios.
Thompson et al 2009	<p>The aim of this study was to explore and explain nurses' use of readily available clinical information when deciding whether a patient is at risk of a critical event. A double system judgement analysis using Brunswik's lens model of cognition was undertaken with 245 Dutch, UK, Canadian and Australian acute care nurses. Nurses were asked to judge the likelihood of a critical event, 'at-risk' status, and whether they would intervene in response to 50 computer-presented clinical scenarios in which data on heart rate, systolic blood pressure, urine output, oxygen saturation, conscious level and oxygenation support were varied. Nurses were also presented with a protocol recommendation and also placed under time pressure for some of the scenarios.</p> <p>Despite receiving identical information, nurses varied considerably in their risk assessments.</p>	<p>The findings in this study revealed nurses underestimate the risk associated with the patient's presenting condition. It also showed that there was no relations between experience and use of intuition. There was an inconsistency in practice and estimation of risk. This has important relevance to clinical practice. Practice developers and educators need to pay attention to the quality of nurses' clinical experience as well as the quantity when developing judgement expertise in nurses. Intuitive unaided decision making in the assessment of risk may not be as accurate as supported decision making. Practice developers and educators should consider teaching nurses normative rules</p>	<p>Some participants felt that the representation of the judgement decision task was too simple.</p>

Reference	Study Description	Strengths	Weaknesses
		for revising probabilities (even subjective ones) such as Bayes' rule for diagnostic or assessment judgements and also that linear ways of thinking, in which decision support may help, may be useful for many choices that nurses face.	
Traynor et al 2010	<p>The aim of this study was to examine how nurses represent professional clinical decision-making processes. Three focus groups with qualified nurses attending post-qualifying courses at a London university were held in 2008. Participants were asked to talk about influences on their decision-making. The discussions were tape-recorded, transcribed and subjected to discourse analysis. Participants described their decision-making as influenced by both indeterminate and technical features. They acknowledged useful influences from both domains, but pointed to their personal 'experience' as the arbiter of decision-making. Their accounts of decision-making created</p>	<p>This study offers new insights to the body of knowledge particularly when considering decisions nurses may find difficult. It offers a window into how nurses manage these types of decisions which may enable ways to help them be developed.</p> <p>Pre- and post-registration nurse education could encourage robust discussion of the definition and roles of 'irrational' aspects of decision-making and how these might be understood as components of credible professional practice</p>	<p>These findings only give insight into nurses actively involved with professional development programmes. They are likely to be different from those who are not, and are possibly more familiar with professional discourses. There was only one group from each speciality and therefore it is hazardous to talk about differences between them. In addition, richer data might have been obtained from longer sessions. The authors state that the quality of the sound recording was occasionally poor making transcription uncertain</p>

Reference	Study Description	Strengths	Weaknesses
	a sense of professional autonomy while at the same time protecting it against external critique.		in places. They state that their conclusions, therefore, are tentative.
Watson 1994	This study explored decisions-making in the clinical area of a medical ward. It used observation, interviews, simulation and 4 decision framed questions that were used as comparative tools. Experience was highlighted as a key factor influencing decision-making.	The study gave insight into how nurses make decisions and highlighted a number of influencing factors thereby adding to the body of knowledge. The methods and methodology allowed some probing into the thought processes of the participants illuminating the process.	Less decisions were made during the data collection time than anticipated. More data may have been collected if this had been for a longer time. The participants found verbalising their thoughts difficult reducing the amount of data collected for the simulations and problems.

Appendix 4 – REC Approval Letter

East Kent Local Research Ethics Committee

South East Coast SHA
Preston Hall
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Kent
ME20 7NJ

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05 February 2009

Mrs Sally Ann Smith
Consultant Nurse, Critical Care Outreach
Maidstone & Tunbridge Wells NHS Trust
Outreach Office, c/o ICU,
Kent & Sussex Hospital Mount Ephraim
Tunbridge Wells, Kent
TN4 8AT

Dear Mrs Smith

Full title of study: **The cultures affecting the recognition and response to deterioration of the unwell ward patient.**
REC reference number: **08/H1103/91**

The Research Ethics Committee reviewed the above application at the meeting held on 10 December 2008.

Ethical opinion

The committee discussed the proposal and discussed the following points.

1. The committee sought clarification to what the researcher was trying to find out, what decisions the researcher is going to be looking for.
2. The committee wanted to know how the researcher was predicting that she will see 20 deteriorating cases.
3. The committee required clarification on what cultures the researchers would be looking for.

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Ethical review of research sites

The Committee agreed that all sites in this study should be exempt from site-specific assessment (SSA). There is no need to submit the Site-Specific Information Form to any Research Ethics Committee. The favourable opinion for the study applies to all sites involved in the research.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission at NHS sites (“R&D approval”) should be obtained from the relevant care organisation(s) in accordance with NHS research governance arrangements. Guidance on applying for NHS permission is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

The Committee agreed that there were no other ethical issues and gave the study a **favourable opinion with conditions** provided that the following points would be changed.

1. The sample size should be reduced and reduce the focus groups.
2. The researcher should formulate questions of what they are interested in finding out from staff.
3. The primary objective of to develop and creating a new system of cultures should be removed.
4. The interviews should be the main focus of the study and the observations are just the background to the study.
5. During the observations the researcher should remain passive at all times unless the situation becomes life threatening.

Approved documents

The documents reviewed and approved at the meeting were:

<i>Document</i>	<i>Version</i>	<i>Date</i>	
Letter of Indemnity			
Information Leaflet - Visitors	1.1	29 October 2008	
Information Leaflet - Staff	1.1	29 October 2008	
Information Poster - visitors & Patients	1.1	29 October 2008	
Information poster - staff	1.1	29 October 2008	
Participant Consent Form	1.1	29 October 2008	
Participant Information Sheet	1.1	29 October 2008	
Interview Schedules/Topic Guides	1.1	29 October 2008	
Letter from Sponsor		04 November 2008	
Covering Letter		29 October 2008	
Protocol	1.1	29 October 2008	
Investigator CV			
Application			

Membership of the Committee

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees (July 2001) and complies fully

with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Now that you have completed the application process please visit the National Research Ethics Website > After Review

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

The attached document “After ethical review – guidance for researchers” gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

We would also like to inform you that we consult regularly with stakeholders to improve our service. If you would like to join our Reference Group please email referencegroup@nres.npsa.nhs.uk.

08/H1103/91

Please quote this number on all correspondence

With the Committee’s best wishes for the success of this project

Yours sincerely

Dr Ray Godfrey
Chair

Email: Hollie.Brennan@nhs.net

*Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments
“After ethical review – guidance for researchers” [SL-AR2 for other studies](#)*

Copy to: Mrs Jayne Ingles

East Kent Local Research Ethics Committee

Attendance at Committee meeting on 10 December 2008

Committee Members:

<i>Name</i>	<i>Profession</i>	<i>Present</i>	<i>Notes</i>	
Dr. Jim Appleyard	Retired Paediatrician	Yes		
Mrs Beverly Donaldson	Midwife	Yes		
Mrs Rebecca Kent	Agricultural Development Researcher	No		
Dr. Bill Plummer	Consultant Psychiatrist	Yes		
Mr. John Skilton	Senior Biomedical Scientist	Yes		
Mr. Michael Tatlow		No		
Dr. Catherine Thompson		No		
Dr. Kate Woolf-May	Exercise Physiologist	No		

Also in attendance:

<i>Name</i>	<i>Position (or reason for attending)</i>	
Mr Jonathan Austin-Jones	Barrister	
Miss Hollie Brennan	Co-Ordinator	
Rev Keith Fazzani	Chaplan	
Dr Ray Godfrey	Educational Statistician	

Appendix 5 – Participant Information Sheet – Shadowing and Interview



University of Brighton



Clinical Research Centre
For Health Professions
Aldro Building
49 Darley Road, Eastbourne BN20 7
Telephone 01273 643647
Fax 01273 643944

Director: Professor Ann Moore www.brighton.ac.uk/sohp/research/

Title of Project: The contextual factors affecting the recognition and response to deterioration of the unwell ward patient'

Dear Colleague,

I wish to invite you to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish.

Part 1 tells you the purpose of this study and what will happen to you if you take part.

Part 2 gives you more detailed information about the conduct of the study. Please ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

I want to understand what caring for an unwell patient is like from your perspective as a member of the multidisciplinary team and what influences the decisions you may make. I think this will help to understand the role of nurses, doctors and other healthcare workers who work in ward environments of this kind.

I would like to hear from you how this feels, what you are thinking when you look after sick patients, and see what you do, what you need and what activities occur at this time.

I am interested in discovering what influences the decisions you make when you are looking after a patient whose condition you are worried about.

I'd like to know what happens before help comes so that ways of making this easier and better for staff and patients can be sought. This may be in the form of a clinical pathway, or educational package that could be developed.

I'll be writing up my study as a description of how healthcare teams look after sick patients. It is part of a research degree that I am undertaking at the University of Brighton.

As a University student myself, I am learning how to interview and discover things from your point of view. I am writing a thesis on what you and other team members do when a patient's condition worsens in a general ward.

Why have I been chosen?

I would like to invite you to take part because you are a team member who cares for unwell ward patients everyday. I feel you will be able to help me to understand what it is like being in your position at these times. I shall also be approaching other people who work on this ward.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part will not affect your role.

What will happen to me if I take part?

I will come to the ward to do 3 things. Sometimes, I shall come along and see what happens on a normal day. This will involve watching all the activities going on in the ward, and I may also ask informal questions. I shall try to keep out of your way.

The second thing I shall do is come along to interview you about your experiences of caring for sick patients. This interview will be taped recorded. Should you agree to be interviewed, the interview will take no longer than an hour and will be arranged at a time to suit you. I shall also take notes during the interview. I may use quotations from what you say when I write up the report. All information I gather from you will be anonymised and your confidentiality will be maintained at all times. I will later write up the interview from the tapes.

The third thing I may do is set up a focus group. This is where a group of you meet with me to discuss what it is like looking after sick patients in this ward. Again, these discussions will be tape-recorded and will take no longer than an hour arranged at a time to suit you. I shall also take notes during the discussion. I may use quotations from what you say when I write up the report. All information I gather from you will be anonymised and your confidentiality will be maintained at all times. I will later write up the discussions from the tapes.

Once the research is complete I shall destroy the tapes and also the written interview and discussion notes.

I anticipate that you may see me over a period of approximately 6 months. I may request to shadow and interview you more than once, should you agree to that.

You do not have to agree to take part in all parts of the study. For example you may prefer to only be interviewed. The consent form will

have separate boxes to sign for each part making it clear to me what you have agreed to take part in.

What do I have to do?

I would be grateful if you would allow me to shadow you for a part of the shift whilst you care for the patients. The interview will take an additional hour at your convenience. The focus group will also be no longer than an hour.

What are the possible disadvantages and risks of taking part?

Being shadowed at work may make you feel a little uncomfortable. I am interested in the activities of the ward. During the interview we will discuss what happened on the day I was shadowing. There are no right or wrong answers to this; I am interested in your opinions and personal experiences. You may feel a little uncomfortable to tell me this. You can contact me at any time following your participation if you wish to talk through anything that perhaps at a later date bothers or upsets you. My contact details are at the end of this information sheet. I have also arranged for a counsellor to be available for you if you feel you would benefit from their help. The contact details are: 'Time 2 Talk', Cobden Road Centre, Cobden Road, Sevenoaks, Kent, TN13 3UB. Telephone: 0845-3452499.

Email: Time2Talk@bott40.freeserve.co.uk

Please ask me for a referral form if you wish to use this service.

What are the possible benefits of taking part?

I am hoping to get an understanding of how the teams work together, and what helps them to work well. This may benefit you in the future.

What happens when the research study stops?

When the study stops, it will be written up as a thesis for my degree. It may also be published in nursing journals and presented at conferences. I shall destroy all tapes and interview transcripts and make sure all those taking part remain anonymous.

What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

Will my taking part in this study be kept confidential?

Yes. I will follow ethical and legal practice and all information about you will be handled in confidence. The details are included in Part 2.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2

What will happen if I don't want to carry on with the study?

Even if you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part will not affect your role.

What if there is a problem?

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, the normal NHS complaints mechanisms should be available to you. You may write contact:

Mrs Sue Prime, Senior Nurse Practice Development at Darent Valley Hospital. Telephone 01322 428878. Email address:

sue.prime@dvh.nhs.uk, who will address your concerns or complaint.

If you any concerns about the conduct of the research, please contact: Professor Julie Scholes, Mayfield House, Village way, Falmer, Brighton, BN1 9PH. Telephone: 01273 644078. Email: J.Scholes@bton.ac.uk

Will my taking part in the research be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you which leaves the hospital will have your name and address removed so that you cannot be recognised from it. Any information that I gain as part of the research will not be passed on, however, I am duty bound, should a rare situation arise where there is real danger, then I would need to follow Trust procedures to manage that situation.

All information I collect will be kept on a password-protected computer and written information and audio recordings in a locked filing cabinet with my locked office at work. It will all be destroyed after 7 years, as per the University of Brighton research guidelines.

What will happen to the results of the research study?

When the study stops, it will be written up as a thesis for my degree. It may also be published in nursing journals and presented at conferences.

Who is organising and funding the research?

The research is being sponsored (supported) by the Trust and the University of Brighton. Some costs associated with the research have been met by the Trust I work in, all others, such as postage have been met by me as researcher. No participants will receive any payment for their participation in this study.

Who has reviewed the study?

The study has been reviewed and given a favourable opinion by the Ethics Committee at the University of Brighton and also the East Kent

Original in colour

Research Ethics Committee to protect your safety, rights, well-being and dignity.

Contact for Further Information

Please do not hesitate to contact me for further information at:

For further information please contact:

Sally Smith
Student Researcher
C/o Professor Julie Scholes
Centre for Nursing and Midwifery Research
University of Brighton
Mayfield House, 1st Floor
Village Way, Falmer
Brighton, BN1 9PH

Telephone: 01892 545969
Email: sally.smith2@nhs.net

Thank you for considering whether to take part in this research.

Appendix 6 – Participant Information Sheet – Focus Group Only



University of Brighton



Clinical Research Centre
For Health Professions
Aldro Building
49 Darley Road, Eastbourne BN20 7
Telephone 01273 643647
Fax 01273 643944

Director: Professor Ann Moore www.brighton.ac.uk/sohp/research/

Title of Project: The contextual factors affecting the recognition and response to deterioration of the unwell ward patient'

Dear Colleague,

I wish to invite you to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish.

Part 1 tells you the purpose of this study and what will happen to you if you take part.

Part 2 gives you more detailed information about the conduct of the study. Please ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

I want to understand what caring for an unwell patient is like from your perspective as a member of the multidisciplinary team and what influences the decisions you may make. I think this will help to understand the role of nurses, doctors and other healthcare workers who work in ward environments of this kind.

I would like to hear from you how this feels, what you are thinking when you look after sick patients, and see what you do, what you need and what activities occur at this time.

I am interested in discovering what influences the decisions you make when you are looking after a patient whose condition you are worried about.

I'd like to know what happens before help comes so that ways of making this easier and better for staff and patients can be sought. This may be in the form of a clinical pathway, or educational package that could be developed.

I'll be writing up my study as a description of how healthcare teams look after sick patients. It is part of a research degree that I am undertaking at the University of Brighton.

As a University student myself, I am learning how to interview and discover things from your point of view. I am writing a thesis on what you and other team members do when a patient's condition worsens in a general ward.

Why have I been chosen?

I would like to invite you to take part because you are a team member who cares for unwell ward patients everyday. I feel you will be able to help me to understand what it is like being in your position at these times. I shall also be approaching other nurses who work on similar wards.

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part will not affect your role.

What will happen to me if I take part?

I am holding a focus group where a group of you meet with me to discuss what it is like looking after sick patients in this ward. These discussions will be tape-recorded and will take no longer than an hour. I shall also take notes during the discussion. I may use quotations from what you say when I write up the report. All information I gather from you will be anonymised and your confidentiality will be maintained at all times. I will later write up the discussions from the tapes. Once the research is complete I shall destroy the tapes and also the written interview and discussion notes.

What do I have to do?

I would be grateful if you would allow me to interview for you as part of a group. The focus group will be no longer than an hour.

What are the possible disadvantages and risks of taking part?

During the focus group we will discuss times when you were caring for a sick patient on the ward. There are no right or wrong answers to this; I am interested in your opinions and personal experiences. You may feel a little uncomfortable to tell me this. You can contact me at any time following your participation if you wish to talk through anything that perhaps at a later date bothers or upsets you. My contact details are at the end of this information sheet. I have also arranged for a counsellor to be available for you if you feel you would benefit from their help. The contact details are: 'Time 2 Talk', Cobden Road Centre, Cobden Road, Sevenoaks, Kent, TN13 3UB. Telephone: 0845-3452499.

Email: Time2Talk@bott40.freeserve.co.uk

Please ask me for a referral form if you wish to use this service.

What are the possible benefits of taking part?

I am hoping to get an understanding of how the teams work together, and what helps them to work well. This may benefit you in the future.

What happens when the research study stops?

When the study stops, it will be written up as a thesis for my degree. It may also be published in nursing journals and presented at conferences. I shall destroy all tapes and interview transcripts and make sure all those taking part remain anonymous.

What if there is a problem?

Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

Will my taking part in this study be kept confidential?

Yes. I will follow ethical and legal practice and all information about you will be handled in confidence. The details are included in Part 2.

If the information in Part 1 has interested you and you are considering participation, please read the additional information in Part 2 before making any decision.

Part 2

What will happen if I don't want to carry on with the study?

Even if you decide to take part you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part will not affect your role.

What if there is a problem?

If you are harmed by taking part in this research project, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you have grounds for a legal action but you may have to pay for it. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, the normal NHS complaints mechanisms should be available to you. You may write contact:

Mrs Sue Prime, Senior Nurse Practice Development at Darent Valley Hospital. Telephone 01322 428878. Email address:

sue.prime@dvh.nhs.uk, who will address your concerns or complaint.

If you any concerns about the conduct of the research, please contact: Professor Julie Scholes, Mayfield House, Village way, Falmer, Brighton, BN1 9PH. Telephone: 01273 644078. Email: J.Scholes@bton.ac.uk

Will my taking part in the research be kept confidential?

All information which is collected about you during the course of the research will be kept strictly confidential. Any information about you

which leaves the hospital will have your name and address removed so that you cannot be recognised from it. Any information that I gain as part of the research will not be passed on, however, I am duty bound, should a rare situation arise where there is real danger, then I would need to follow Trust procedures to manage that situation.

All information I collect will be kept on a password-protected computer and written information and audio recordings in a locked filing cabinet with my locked office at work. It will all be destroyed after 7 years, as per the University of Brighton research guidelines.

What will happen to the results of the research study?

When the study stops, it will be written up as a thesis for my degree. It may also be published in nursing journals and presented at conferences.

Who is organising and funding the research?

The research is being sponsored (supported) by the Trust and the University of Brighton. Some costs associated with the research have been met by the Trust I work in, all others, such as postage have been met by me as researcher. No participants will receive any payment for their participation in this study.

Who has reviewed the study?

The study has been reviewed and given a favourable opinion by the Ethics Committee at the University of Brighton and also the Kent Research Ethics Committee to protect your safety, rights, well-being and dignity.

Contact for Further Information

Please do not hesitate to contact me for further information at:

For further information please contact:

Sally Smith
Student Researcher
C/o Professor Julie Scholes
Centre for Nursing and Midwifery Research
University of Brighton
Mayfield House, 1st Floor
Village Way, Falmer
Brighton, BN1 9PH

Telephone: 01622 227079

Email: sally.smith2@nhs.net

Thank you for considering whether to take part in this research.

Appendix 7 – Leaflets for Participants

Introduction

Thank you for taking the trouble to read this information about my research that I have been carrying out in the hospital. I hope this leaflet helps you to make an informed decision as to whether you wish to take part.

On the back of this leaflet are my contact details should you wish to know more or have any questions you wish to ask me.

The Purpose of the Study

I wish to understand what caring for an unwell patient is like from your perspective. I would like to hear from you how this feels, what you are thinking when you look after sick patients, what you need and what activities occur at this time.

I am interested in discovering what influences the decisions you make when you are looking after a patient whose condition you are worried about. I'd like to know what happens before help comes so that ways of making this easier and better for staff and patients can be sought. This may be in the form of a clinical pathway, or educational package that could be developed.

I'll be writing up my study as a description of how healthcare teams look after sick patients. It is part of a research degree that I am undertaking at the University of Brighton. As a University student myself, I am learning how to interview and discover things from your

point of view. I am writing a thesis on what you and other team members do when a patient's condition worsens in a general ward.

Why is this Important?

This is an area of nursing we don't know very much about. We don't actually know very much about how nurses and doctors look after these patients before a senior person or critical care nurse or doctor gets involved and what influences the decisions they make.

Most of the literature and evidence available to us at present has been carried out in specialist areas such as A&E, CCU or ICU, or about patients who were admitted to those areas. It seems timely to investigate how staff experience caring for those who become ill but do not reach or require these areas due to the effective care they receive.

What will taking part involve?

I would like to invite you to join me for an hour as part of a focus group with a few other colleagues who work in the Trust, no more than 10 people in total. This is so that I can learn about your experiences when caring for someone who you are worried about. I'll be asking you about how you felt, what affected the way you did things and generally your experience looking after an unwell patient. There are no right or wrong answers to this; I am interested in your opinions and personal

experiences. I won't keep you for longer than an hour for the focus group.

You can contact me at any time following your participation if you wish to talk through anything that cropped up in the focus group. My contact details are at the end of this information sheet.

Information I shall collect

I plan to tape the focus group and transcribe what people say. All this information will be anonymised so that you will not be recognised, and will be kept confidential. The information (data) will be stored on a password-protected computer or in a locked cabinet within my locked office at my workplace. It will be destroyed when the study is completed. You need to know I may use quotations that you have said in my write up – but these will be made unrecognisable as coming from you.

If you change your mind

You don't have to take part at all. If you decide you wish to there is a consent form to sign on the day.

Even if you give consent to take part you are free to change your mind at anytime and withdraw. Just let me know. This will have no affect at all on you and your work within the ward.

Thank you for taking time to read this leaflet.

Original in colour



University of Brighton



Clinical Research Centre
For Health Professions
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Telephone 01273 643647
Fax 01273 643944
Director: Professor Ann Moore
www.brighton.ac.uk/sohp/research/

For further information please contact:

Sally Smith
Student Researcher
C/o Professor Julie Scholes
Centre for Nursing and Midwifery
Research
University of Brighton
Mayfield House, 1st Floor
Village way
Falmer
Brighton
BN1 9PH

Telephone: 01622 227079
Email: sally.smith2@nhs.net

**Information about the Research
Study entitled:**

**The contextual factors affecting the
recognition and response to
deterioration of the unwell ward
patient**

A Doctoral Study for part fulfilment of a
Professional Doctorate in Nursing at the
University of Brighton

Introduction

Thank you for taking the trouble to read this information about my research that I have been carrying out in the hospital. I hope this leaflet helps you to make an informed decision as to whether you wish to take part.

On the back of this leaflet are my contact details should you wish to know more or have any questions you wish to ask me.

The Purpose of the Study

I wish to understand what caring for an unwell patient is like from your perspective. I would like to hear from you how this feels, what you are thinking when you look after sick patients, what you need and what activities occur at this time.

I am interested in discovering what influences the decisions you make when you are looking after a patient whose condition you are worried about. I'd like to know what happens before help comes so that ways of making this easier and better for staff and patients can be sought. This may be in the form of a clinical pathway, or educational package that could be developed.

I'll be writing up my study as a description of how healthcare teams look after sick patients. It is part of a research degree that I am undertaking at the University of Brighton. As a University student myself, I am learning how to interview and discover things from your point of view. I am writing a thesis on what you and other team members do when a patient's condition worsens in a general ward.

Why is this Important?

This is an area of nursing we don't know very much about. We don't actually know very much about how nurses and doctors look after these patients before a senior person or critical care nurse or doctor gets involved and what influences the decisions they make.

Most of the literature and evidence available to us at present has been carried out in specialist areas such as A&E, CCU or ICU, or about patients who were admitted to those areas. It seems timely to investigate how staff experience caring for those who become ill but do not reach or require these areas due to the effective care they receive.

What will taking part involve?

I would like to invite you to join me for an hour as part of a focus group with a few other colleagues who work in the Trust, no more than 10 people in total. This is so that I can learn about your experiences when caring for someone who you are worried about. I'll be asking you about how you felt, what affected the way you did things and generally your experience looking after an unwell patient.

There are no right or wrong answers to this; I am interested in your opinions and personal experiences. I won't keep you for longer than an hour for the focus group.

You can contact me at any time following your participation if you wish to talk through anything that cropped up in the focus group. My contact details are at the end of this information sheet.

Information I shall collect

I plan to tape the focus group and transcribe what people say. All this information will be anonymised so that you will not be recognised, and will be kept confidential. The information (data) will be stored on a password-protected computer or in a locked cabinet within my locked office at my workplace. It will be destroyed when the study is completed. You need to know I may use quotations that you have said in my write up – but these will be made unrecognisable as coming from you.

If you change your mind

You don't have to take part at all. If you decide you wish to there is a consent form to sign on the day.

Even if you give consent to take part you are free to change your mind at anytime and withdraw. Just let me know. This will have no affect at all on you and your work within the ward.

Thank you for taking time to read this leaflet.

Original in colour



University of Brighton



Clinical Research Centre
For Health Professions
Aldro Building
49 Darley Road, Eastbourne BN20 7
Telephone 01273 643647
Fax 01273 643944
Director: Professor Ann Moore
www.brighton.ac.uk/sohp/research/

For further information please contact:

Sally Smith
Student Researcher
C/o Professor Julie Scholes
Centre for Nursing and Midwifery
Research
University of Brighton
Mayfield House, 1st Floor
Village way
Falmer
Brighton
BN1 9PH

Telephone: 01622 227079
Email: sally.smith2@nhs.net

**Focus Group Information about the
Research Study entitled:**

**The contextual factors affecting the
recognition and response to
deterioration of the unwell ward
patient**

A Doctoral Study for part fulfilment of a
Professional Doctorate in Nursing at the
University of Brighton

Appendix 8 – Information Poster

You are Invited

to be part of a research project.

I am interested in looking at ward activities that staff engage in when caring for unwell patients.

Volunteers requested!

I shall be undertaking short periods of observation of the daily activities and routines in the ward. I shall be approaching people to ask if they mind my shadowing them and interviewing them on their personal experiences and opinions about these activities.

This is part of my research degree at Brighton University.

Please find attached information on this project and don't hesitate to contact me on the number below for further information.

Thank you!

**Please contact: Sally Smith on:
Tel: 01892 632300/01622 224392
Email: sally.smith2@nhs.net**

NB: A box containing copies of the PIS will be placed below this poster.

Appendix 9 – Consent Form – Fieldwork, Interview and Focus Group



University of Brighton



Clinical Research Centre
For Health Professions
Aldro Building
49 Darley Road, Eastbourne BN20 7
Telephone 01273 643647
Fax 01273 643944

Director: Professor Ann Moore www.brighton.ac.uk/sohp/research/

Study Number: 08/H1103/91

CONSENT FORM

Title of Project: The contextual factors affecting the recognition and response to deterioration of the unwell ward patient'

Name of Researcher: Sally Smith

Please initial box

- | | |
|--|--------------------------|
| 1. I confirm that I have read and understand the information sheet dated April 2009 version 2 for the above study and have had the opportunity to ask questions. | <input type="checkbox"/> |
| 2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my rights being affected. | <input type="checkbox"/> |
| 3. I agree to take part in being shadowed. | N/A |
| 4. I agree to take part in an interview. | <input type="checkbox"/> |
| 5. I agree to take part in a focus group. | N/A |
| 6. I agree to the use of anonymised quotations in publications and presentations | <input type="checkbox"/> |

_____	_____	_____
Name of Participant	Date	Signature

_____	_____	_____
Researcher	Date	Signature

1 for participant; 1 for researcher

Appendix 10 - Consent Form Interview Only



University of Brighton



Clinical Research Centre
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Study Number: 08/H1103/91

CONSENT FORM

Title of Project: The contextual factors affecting the recognition and response to deterioration of the unwell ward patient'

Name of Researcher: Sally Smith

Please initial box

- | | |
|--|--------------------------|
| 1. I confirm that I have read and understand the information sheet dated April 2009 version 2 for the above study and have had the opportunity to ask questions. | <input type="checkbox"/> |
| 2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my rights being affected. | <input type="checkbox"/> |
| 3. I agree to take part in being shadowed. | N/A |
| 4. I agree to take part in an interview. | <input type="checkbox"/> |
| 5. I agree to take part in a focus group. | N/A |
| 6. I agree to the use of anonymised quotations in publications and presentations | <input type="checkbox"/> |

_____	_____	_____
Name of Participant	Date	Signature

_____	_____	_____
Researcher	Date	Signature

1 for participant; 1 for researcher

Appendix 11 – Excerpts of Field Notes & Reflective Diary

The following excerpts have been transcribed from my handwritten field notes, memos and reflective diary to illustrate the audit trail, theorising and operationalising reflexivity throughout the data collection periods as well as the data analysis, including the writing up of the thesis.

Example of notes taken as analytical memos during fieldwork. These memos formulated the interview questions to generate data.

General Observations	Memos – questions for interview	Reflections
<i>Junior Sister – commenced at 0800. Saturday Drug round at 0815 26 bed ward – extra window bed in place.</i>	<i>Leadership role How does Saturday change things?</i>	<i>People looking quizzically at me</i>
<i>Interrupted by domestic regarding a query over a patient.</i>	<i>Extra bed – impact on caring and noticing Bed management pressures – impact of this on caring for the ill?</i>	<i>Was there the Hawthorn effect?</i>
<i>Communication to Dr – giving overview of patients: Observation of jaundice – planned investigations for the day Guiding Drs with patients who have been reviewed by other teams – to discuss before making diagnosis Nebuliser on patient – advising Dr to put as ‘regular’ rather than ‘prn’</i>	<i>Power relationships? Knowing the patient or not with regard to continuity of care.</i>	<i>Wanting so badly to assist in care!</i>
	<i>What strategies, if any did she use to persuade or convince? How did this feel?</i>	<i>In interview – very naïve asking simple questions. Am I influencing their response from my questioning style – be aware - ??better use of topic guide??</i>
	<i>What was she using her piece of paper/notebook for?</i>	<i>** Do conceptual framework to help situate myself and theoretical stance</i>
	<i>Role on ward round – how perceived?</i>	

The above is a very short example of many notes taken during the fieldwork sessions and interviews. The interview data led to further memos and conceptualising informing the on-going sessions.

Excerpt from Reflective Diary

My Reflective Diary was written as a Word™ document following times of data collection, analysis, action learning and meetings with Prof Doc colleagues.

September/October 2005

Following the first 2 study days at Eastbourne, my motivation has been to read around much of my old MSc work on reflection. I have also read around critical thinking in the work place, critical reasoning, and have been thinking about professional judgement and decision-making.

The urge from the tutors has been to find your 'disturbance'. The thing within practice that has been a perennial problem, puzzlement, problem, issue that has not been resolved.

The emphasis has been to describe this, rather than apply a theory or solution to it.

In order to do this, I have read about reflection. This has led me to Donald Schon with his reflection in action – quick reflex decisions and reflection on action, the post mortem of what actions were taken in practice.

I have also been thinking about the ways we know things in practice, looking at Carper's patterns of knowing, and relating this to John's model of structured reflection.

In addition I have also been reading around epistemology and ontology via the Crotty book.

The latter 2 days 20th and 21st Oct have been even more enlightening with the pictorial mind mapping and written mind mapping of my disturbance. This has been focussing on the perspective of the patient becoming ill, and what it is like for them. Also focussing on why nurses are still not acting on observations on patients that are clearly abnormal.

Discussion with AC (Consultant Anaesthetist)

Informal chat with him around suboptimal care. Was it there before but we didn't know? We weren't measuring it. We weren't aware of it.

Thoughts

This is a nursing research project – look at the nursing perspective.

Look at research philosophies to represent the ways of knowing in the work place.

Reflection of shift on the 30th December 2005.

The patient was identified as sick, but actions to remedy this were not fast enough. Monitoring was not forthcoming. Fluid chart had not been kept. Wrong oxygen mask on the patient. When reviewed, fluids written up were not fast enough at 125mls/hr. She may have benefited from a fluid challenge.

2nd January 2006

On discussion with Laura – the key problem is recognition of these patients. Thoughts about comparisons with Benner.

2007 – Planning Study

Interaction with a colleague from a neighbouring Trust



I made a fatal mistake!

I approached P in the atrium of the hospital after a meeting and very clumsily asked if he would consider me doing the study with his outreach staff. He asked what it was about and I said suboptimal care. He expressed concern that I would be out to 'pick holes' in the work of the nurses. I floundered. He graciously agreed to consider this, asked for a summary of the protocol, but looked very very unsure.

The learning from this, supported by discussion at the ALS and cohort much later was that a speech needs to be prepared when researchers are approaching potential participants and negotiating access.

September 2007

The design of the study is the thing to crystallise.

ALS was very helpful in helping me to think about this. I shall develop an approaching participant speech.

I shall pilot the PIS. Friends A and AN Wilson have agreed to use.

A has also kindly agreed to let me practice interviewing on her.

I need to pilot participant observation as well. I shall seek ethical approval for this.

2008 – Autumn

Gaining Access

This has been easy and hard. I have been amazed at how friendly and obliging MB in R&D has been in helping me.

Meeting the XX was very interesting. She wanted me to use my research to unpick an SUI she had. This left me feeling very uncomfortable as it was not the purpose of my research. It made me feel that I could lose the trust of the participants if they thought I was spying on them. However I had an overwhelming urge to help and to reciprocate.

Ethics Form

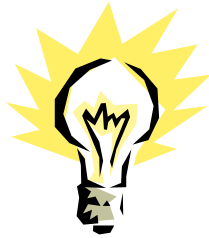
This has taken all year to finalise. FREGG was pretty painless, minor amendments to the consent form and I had approval.

REC Meeting

Have just got home after a challenging experience at the Ethics Committee. It has been approved provisionally with amendments – but the amendments were so drastic my study is no longer ethnography, with no longer the same title, or objectives or methods.....

During the Data Collection and Analysis periods – 2009-2010

Struggling to see the familiar as strange. Met with AP today in Canterbury's library. We sat, high up on floor 5, looking at the cathedral. In supervision Ruth and Julie suggested using music as a metaphor. With AP's help we developed this using my data.



Wow – A breakthrough! It now makes more sense.

Metaphor of music:

The orchestra

Who are the players?

Who is the Conductor?

Who is the soloist?

Who is in tune, or out of tune?

Who or what is the quiet silent triangle?

September 2010

Chatting to a friend – so difficult to do 'abstraction'.

She suggested the psychological literature.

Chatted to KT (Prof Doc colleague) – positioning theory? A concept to use?

Google images – excellent – images of control, musical metaphors, uncertainty and much more.

Consider locus of control, collegial verification, authentication, good concepts and labels – thank you KT for the insights!

Continued.....

Much of the memoing and reflections were captured and organised through the analytical tables and explanatory matrices from here on. Examples are given in Figure 4.5 and 4.6, chapter 4.

Appendix 12 – Interview and Fieldwork Topic Guides

Topic Guide for the Semi-Structured Interviews

Introducing myself: a list of self-instructions

1. Greetings and Thanks
2. Explain the purpose of the interview, and that it will last approximately 45 minutes and no longer than an hour.
3. Explain the purpose and nature of the study in everyday language, telling how and why he/she has been selected.
4. Give assurance that they will remain anonymous in any written reports growing out of the study, and that his responses will be treated in strictest confidence. Explain that direct quotations may be used in the written report.
5. Indicate that I might ask what seem silly or far-fetched questions (in an effort to not be blinded by familiarity as an insider), and that some may be difficult to answer. Explain that since there is no right or wrong answer, they are not to worry about these, but do the best they can with them. Reassure that I am only interested in his opinions and personal experiences.
6. They are free to interrupt, ask clarification of me, criticise a line of questioning etc.
7. I will tell them my background, training and the interest I have of this enquiry.
8. I will ask permission to tape record the interview and explain why I wish to do this.
9. I will explain that I may also take notes.

(Adapted from Robson 2002)

I will use this part of the interview to seek refresh consent, and check they are still happy to take part.

Possible Interview Schedule – Staff Member

Thank you for being willing to take part in a follow-up interview to the previous shadowing. Can I first assure you that you will remain completely anonymous and no records of the interview will be kept with your name on them. I also wish to assure that the tape recordings will be destroyed, including the transcriptions of them once the research is written up.

1. Can I first ask you what your post is?
Take details of
Job
Rank
Specialty
2. General 'grand tour' topic guide
A description of what was happening
What did they feel their role was whilst caring for the patient?
What were they thinking?
What led them to call an Outreach Nurse?
What led them to call a doctor?

Why did they think this patient is deteriorating?
What were the clues and cues they used?

3. 'Mini tour' questions structural and contrast questions
What did they notice about the patient?
How did certain actions by others make them feel?
How have past recent experiences affected them? (May have had similar case that influenced how they were feeling, for example).
How did their interaction with others affect how they acted and felt?
How did these things affect their decision-making?
Try to unpick intuitive thinking
4. End the Interview
Move the subject to a lighter topic to finish.
Offer a chance for the researcher to offer me feedback on how the interview went.
Ask them if they have any questions.
Explain that they can contact me at any time, and how, if later there is something they have said that they may want to talk about again, (or even retract).
Thank the participant and explain that they will receive a transcript of the interview to check for accuracy

Possible Interview Schedule – Patient

I plan to ask patients questions about how they felt throughout the episode.

I will ask them what they noticed when being cared for by the nursing team at that time.

I may ask specific things about the incident prompted from my own observations and interviews with staff.

The purpose of these interviews, should they occur, is to gain cultural information from the perspective of the patient in order to illuminate emerging themes.

This topic guide is very general due to the inductive nature of the research.

Proposed Fieldwork Schedule

Broad Observations

Placing myself in the general ward area, making notes of the surroundings, what is positioned where, what people are doing as routine ward activities.

I will be describing where people place themselves, what activities are taking place, what people use to undertake those activities, and how long they spend doing different things.

This is to get a general feel of what a normal day is like on the ward. Who comes and goes, and what the routines are.

Shadowing Staff

Shadowing a ward nurse in a 'bay' or area where he/she is working and watching what is going on.

This will include observing interactions with other members of the team, what the nurse uses and does when caring for the patients, who comes and goes, who is involved, and the influence they have on the situation.

As time goes on I will probably chat to the nurse about what they are doing and how they feel about this, and possibly what their goal is as they are carrying out their tasks.

Working with Staff

I envisage that I will be able to assist with some tasks. I will be able to help the nurse, say, reposition a patient, fetch equipment, relay messages etc. I will try to keep out of the way, but anticipate that it may be helpful to be of some use, in part by way of reciprocation for their willingness to assist me with the study.

Documents

I will be looking at documents in the ward. These may be posters and notices that I will describe in my fieldnotes. By virtue of the type of fieldwork I will be doing, I will see patients' observation charts and documentation. I do not plan to make notes about these, so will be seeing them in the context of clinical care rather than research data. If a patient gives informed consent to take part in the study, I may use this as data anonymised and in confidence.

Patient Safety

Should I witness unsafe practice, I am duty bound to take action. I will intervene if the following occurs:

- A patient is experiencing a life-threatening event, for example cardiac or respiratory arrest, or deterioration that staff are not responding to
- Patients lives are at risk from other patients or a fire
- No healthcare professional is present and the patient is in danger or at risk of sustaining an injury, for example a fall
- Poor practice may harm a patient or staff member

I will have an honorary contract and will practise in line with my own Professional Code of Conduct and also within the Trust's own policies and procedures. This will be the case if poor practice is witnessed.

2 **Appendix 13 - Excerpt of Interview Transcript**

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Interviewer

How long have you been qualified?

And how long you have worked on this ward?

Participant

I trained at Hertfordshire.

I then came straight to this Trust as a newly qualified nurse.

I have been qualified 3 and a half years now.

I will have been with the Trust 4 years in January.

Interviewer

On this ward?

Participant

No.

I have been here for about 18 months.

Interviewer

And what did you do before that?

Participant

I started off in elderly care for a few months. And they shut that ward.

I went to CCU and did a little while on CCU.

Then I went to it's a different ward now, but Chestnut, which was cardiac step down and medical.

I came here for a little while in between a few bits to cover something, then applied to come back again.

Interviewer

So you've got a little bit of critical care experience behind you. Have you done any other courses?

Participant

HDU course.

Interviewer

The in house 5-day course?

Participant

Yep. And I'm in the process of doing my respiratory care course.

Interviewer

Do you learn about NIV and all that?

Participant

Yeah.

51 Interviewer

52 So today in the bay, thinking about the patients, we've got the tracheostomy patient, the
53 patient with NIV and you had a student. But you didn't appear to have any other support
54 in there.

55

56 Participant

57 I did have the HCA come in a bit later.

58 Well, not too bad because actually the HCA who turned upon the bank was brilliant.

59 They got on with things and got the patients washed and sorted.

60 And I didn't have to worry about them too much.

61

62 Interviewer

63 With the chap with the tracheostomy, looking at him and when you are sort of assessing
64 him. What's going through your head when you've got a patient like that?

65

66 Participant

67 Well, obviously his first priority is always going to be his airway, isn't it? *{chuckles}*.

68 Erm, just, erm, as with any other patient, your assessment looking at the whole patient, is
69 their breathing OK, do they sound, obviously a lot more of it is listening with the trachy
70 than with the other patients.

71 Does he sound like his breathing's OK and is he clear?

72 Having a look, all his other obs are they fine? Just generally looking at him.

73

74 Interviewer

75 Do you find the PAR score helpful?

76

77 Participant

78 Yes.

79

80 Interviewer

81 What do you find helpful about it?

82

83 Participant

84 Umm, I find, I think with the older people sometimes it's difficult because they're just
85 got, you know, generally chronic problems, and that keeps scoring.

86 With the younger people they're compensating really well, and your not noticing, looking
87 at them so much that that can sort of indicate something's going on.

88 Coz they'll look fine sitting there in the chair, you know, the 40 50 year olds, that are
89 kinda of fine but the PAR score can kind of make you keep a closer eye on them, when
90 you might otherwise... *{not}*

91

92 Interviewer

93 The other nurses have said they're obs can be fine, but I've been worried.

94

95 Participant

96 Yeah

97

98 Interviewer

99 What is that? Can you describe to me times when you have felt like that?

100 Participant
101 I don't know – you just get a feeling don't you?
102 You just look at them and think it's just are not quite right.
103 I can't explain it either but we all do it don't we?
104 And it's so difficult because you can't call a doctor, you can't say to them I've got a
105 feeling , and you're looking for something to tell them is wrong with them, and there is
106 not always something there.
107 But 9 times out of 10 they get poorly don't they?
108
109 Interviewer
110 And when you've looked back have you been able pinpoint it?
111
112 Participant
113 Not always. There's still not always something that's ... Strange isn't it?
114
115 Interviewer
116 Do you think it is something to do with knowing the patient, or?
117
118 Participant
119 It might be.
120 You probably notice little changes without realising don't you?
121 If you talk to them every day and you come in and they're a bit more down.
122
123 Interviewer
124 It is interesting how people like you are right in these cases. But the interesting thing
125 about the PAR score it doesn't say that the patient's character has changed.
126 What I have picked up is often the first thing people notice is that the patient's character
127 has changed before their obs do. Like H yesterday, he is a completely different person
128 today. It was C {HCA} that said that, he's not fighting.
129 When you are worried about somebody, do you ever feel, like when you said they don't
130 have a PAR score and you have nothing to refer. Do you ever refer to a doctor anyway?
131
132 Participant
133 Yeah. It is a lot easier in the week in the daytime because they are on the ward.
134 So you can say to them "I'm not sure what's wrong with them but I think they're not very
135 well".
136 And they're around and they don't kind of, it's not such a big deal, they might go and
137 have a look and see what they think as well.
138 It's harder on the nights and at weekends because they've got to prioritise their care. And
139 if they've got someone phoning up and they've got a PAR score of 5 and they've got this
140 and that, and I'm saying "Well all their obs are fine but I really don't think they're well."
141 I'm going to be at the bottom of their list.
142
143 Interviewer
144 How do you convince them?
145
146 Participant
147 {pause} It depends what else they've got going on.
148 Because we have to be realistic as well because if somebody is really really obviously
149 poorly, they're not going to leave them and come to our patient are they?

150 We'd have to wait, keep a close eye on them keep looking and doing their obs more.
151
152 Interviewer
153 Do you think that out of hours causes delays for people that are ill?
154
155 Participant
156 {*pause*} Yeah. It's better, they've tried to change things slightly.
157 The night nurses that, night sisters, the bleep holders, have taken on a more hands on role,
158 I think.
159 And now, if there is anyone on the night shift that you are at all worried about, they want
160 to be sort of aware of them and they will keep checking up on them.
161 So there's more people aware of the people unwell.
162 Which does make it easier because if they know that someone's unwell already and you
163 ring up and say I need someone to see them, if they already know about them, and they
164 think "Oh well we did know they were unwell".
165 You're more likely to get someone to come and see them.
166
167 Interviewer
168 So it's almost like drip feeding this information to them that somebody's not right that
169 someone's not well, everything's ticking along but we're worried.
170
171 Participant
172 And also we've got the medical emergency thing now.
173 If it's all going horribly wrong, and the PAR, they have to come then, so, {*chuckles*},
174 they have to come there's no 2 ways about it.
175
176 Interviewer
177 Do you think there are very many occasions when you are worried about someone
178 unnecessarily?
179 Or do you think normally it turns out that you're actually right?
180
181 Participant
182 I think we're normally right, they're normally in hospital for a reason aren't they?
183
184 Interviewer
185 With your student, how do you think we can teach them this 6th sense thing?
186
187 Participant
188 I think some of them turn up with it in the first place don't they?
189 I don't know if it is something you can teach them or they've got the feelings as well.
190
191 Interviewer
192 Do the students report things to you well?
193
194 Participant
195 Some of them.
196 Depends on the student.
197
198 Interviewer
199 Something that has come up is a lot of your colleagues think the training has changed.

200
201 Participant
202 I think it probably has quite a bit.
203 Like we were saying earlier that they come out with this wordy things with all the
204 outcomes they've got to get and it doesn't seem to be anything specific that they've got to
205 be able to do.
206 It's just all these wordy flowery outcomes, you know.
207 But nothing actual, there's nothing to prove that they can do all the clinical nursing skills
208 when they qualify, that they're gonna need to do.
209 All of a sudden you have to do on your own.
210
211 Interviewer
212 Something you said in the middle of the day when we were talking about families, "you
213 have to be clear about what you know".
214
215 Participant
216 Well, you know, don't let them push you in to things, because you are the nurse, you've
217 done your training and you have to be sure about, you know, if you're not sure about it
218 check with someone else.
219 Don't let the family sort of persuade you that you don't know it if you do, if you see what
220 I mean.
221
222 Interviewer
223 They can tip you out of your comfort zone and then you pick up don't you?
224
225 Participant
226 You still need to be quite confident with everything which is why the courses and the
227 training does help.
228 You know you've been on a course, you've learnt it and that is right.
229 You can say to them "No, this is, you know I know I'm doing is correctly".
230
231 Interviewer
232 And also I think, it's knowing the patient isn't it?
233
234 Participant
235 But they've all been out there and been on the worldwide web looking everything up and
236 they also think that they know.
237
238 Interviewer
239 What role do you think all the knowledge you've gained has helped when you've cared
240 for sick patients?
241
242 Participant
243 Confidence.
244 Feeling more confident to do things and say "I should do this" and you know until you
245 can get someone to come and see them as we were saying you've got to be confident
246 enough to say "I want you to come because" rather than like "Oh I think they might be
247 poorly".
248

249 Interviewer
250 Back to how you refer. I noticed you were very autonomous in there, just got on with it,
251 sorting out the patients' treatment plans, experienced people need the doctors less often.
252 Would you say that's true, would you say that the junior people refer on more?
253

254 Participant
255 Yeah, or they tend to refer to the more senior nurses on the shift I think.
256 They keep coming and checking with them rather than with the doctors.
257 Coz sometimes they're a little bit embarrassed to ask the doctors.
258

259 Interviewer
260 Do they refer to you with numbers or do they have the courage to say "something's
261 wrong and I don't know"?

262

263 Participant
264 Depends. It can be numbers, it can be a drug chart in front of you, a blood pressure or
265 a,...

266

267 Interviewer
268 I might interview a student to get their view.
269

270 Participant
271 It's probably very different or them as they've got no actual responsibility for it.
272 So to them it's probably just quite interesting.
273 There's not that panic that I've got 6 poorly people reliant on me.
274 Whereas if it was one of the newly qualified nurses {*chuckles*} they probably just feel
275 sheer terror whereas the student... as I remember it, it wasn't that long ago, you were
276 never actually responsible for it, so it was just interesting.
277

278 Interviewer
279 So do you think that that acts like a comfort blanket really?
280 So what does that responsibility feel like to you?
281

282 Participant
283 {*pause*} Got a bit used to it now but it was awful to start with.
284

285 Interviewer
286 What did you feel? Fearful? Or?
287

288 Participant
289 Everything you did, you'd go home and in bed in the middle of the night you'd think "Oh
290 my God did I do this alright? Did I do that?"
291 Waking up and thinking "What are you doing?!" Ring work and check I've done
292 something.
293 It's just the pure panic all the time that you've forgotten something.
294

295 Interviewer
296 How did that change? What's changed that for you do you think?
297

298 Participant
299 I think it helps once you get to know your team, and you know that if maybe you have
300 missed a little thing that they'll pick it up and it's not going to be the end of the world and
301 they'll do that for you on the next shift, you know, I'm not talking about big life
302 threatening things, you know, little things that someone else will, you know, filling in a
303 form or doing this.
304 And then someone else will go and they'll do it for you.
305 It's not the end of the world and you have got the next shift coming on and your
306 colleagues that are gonna notice the same things.
307

308 Interviewer
309 One of themes I've got is trusting others or not trusting others. Because in the past the
310 other team had let this girl down {*Précis of conversation*}.
311 I wondered what that was like for you, watching the interaction with the Tissue Viability
312 Nurse for example. People on this ward have talked a lot about S the respiratory nurse,
313 what's it like working with other teams?
314

315 Participant
316 It does depend on your experience with them to start with. S is brilliant and we do a lot
317 of training with S a lot of our knowledge has come from her so we see our trust is in her.
318 But she also trusts us because she knows she has taught us it.
319 So you know she knows we've got the knowledge.
320 Then when we go to her and tell her something obviously it is a lot easier.
321

322 Interviewer
323 What about the outreach girls?
324

325 Participant
326 Outreach are very good as well but there are not many of them at the moment. Although
327 a lot of the site team are previous outreach nurses in this hospital so we still sort of see
328 them as the outreach team. Though they're not!
329 No they're very good.
330 Recently they have been, sending, giving the bleep to ITU Sisters, and that's been very
331 different coz they're used to looking after 1 patient, and they're saying to me, "Oh you've
332 given some Furesomide, you need to take their blood in 4 hours."
333 Whereas Outreach are a little bit more realistic about what I can physically do with that
334 many patients on the ward.
335

336 Interviewer
337 So part of your work and being effective at work is other people understanding your
338 workload?
339

340 Participant
341 Yep. They {*ITU Sisters*} get quite frustrated with us as well in that sort of instance
342 because they just think "Well why can't you do this?"
343

344 Interviewer
345 Why do you think they're saying that?
346

347 Participant
348 Because they've not experienced it. It's a long while since they've done it. I know when
349 I was on CCU and we had 10 patients, well we had 10 beds,
350 I had a couple of patients, coming back to the ward I thought "God, where am I meant to
351 be, what am I doing?"
352 So you just, you know, as soon as you stop doing something you forget very quickly I
353 think.
354 But they're just thinking, well this is a priority, this patient.
355 But you can't just ignore everyone else can you?
356

357 Interviewer
358 When you were in your bay with the diabetic guy. Were you aware of the other patients
359 in the bay in the back of your mind?
360

361 Participant
362 Well, you're still listening for your trachy, and our apnoea bleep,
363 *{Interruption}*
364 You'll still listening to everything else that's going on.
365

366 Interviewer
367 Is that stressful, or has it become routine to you?
368

369 Participant
370 I don't mind, like today I have just got those 6 patients and that's lovely because I can be
371 with someone and can hear all the others.
372 Normally, I haven't got that luxury. Half my patients aren't in that bay.
373 So that's a bit more stressful because the trachy patient's not always in my eye or earshot
374 and that stresses me out a bit more because I can't always know they're OK.
375

376 Interviewer
377 What do you do on those sort of days?
378

379 Participant
380 Check them a lot. *{Laughs}* Keep running in. "Have you seen them recently", I'm
381 saying to the HCA "are they alright?"
382 Because obviously if they've just been talking to a Healthcare Assistant, you know, not
383 my imminent danger, problem, running in and out.
384

385 Interviewer
386 Is there anything else you do to keep the vigilance up? Any other strategies you use?
387

388 Participant
389 Well, with the NIV patient we use the hourly obs charts, things like that.
390 And make sure, anything you're doing hourly, if you've got your fluid chart half hourly
391 in between that means you're back a lot more.
392 In between someone's going to check them.
393 Also, if you know, if you have got a cardiac monitor on something, it does help that
394 you've got something that's alarming, that if you're not there so you can kind of think oh,
395 you can't rely on it completely, they're always dying, things coming off them, but it's a
396 little bit to put your mind at rest slightly, that something's not beeping at you.

397 Interviewer

398 So when you're short staffed how do you, what happens then to the sick people?

399

400 Participant

401 Obviously they're going to be the priority. So, they get most of the attention.

402 And you have to sort of you know prioritise. The others, it's not so much the crucial

403 things that get left till late but we might still be doing washes at 3 in the afternoon.

404 It's got to be the kind of personal care things that get pushed back a bit, which the

405 patients get really anxious about.

406 They'll be like at 10 o'clock "Why haven't I had a wash, why haven't I had a wash?"

407 You feel awful, but, it's got to be safe.

408

409 Interviewer

410 My prior view was that sick patients on a busy day get left, but this isn't so in this

411 research.

412

413 Participant

414 Umm, I still would have had to suction as much, I still would have had to check the other

415 patient. I probably, what I wouldn't have been able to do though is probably wash them,

416 so I wouldn't know if they had a sore.

417 I wouldn't know those little things, their skin, things like that, you know, are quite

418 important. But they're the bits that would have got left, but I still would have been in

419 there suctioning and doing all the other things.

420

421 Interviewer

422 How would that have made you feel that day?

423

424 Participant

425 I probably wouldn't have been quite so successful; you like to finish everything off don't

426 you?

427

428

429 Continued.....

430

Appendix 14 – Focus Group Topic Guide

PowerPoint™ Presentation of emerging concepts for verification purposes.

Building the Case

- Building the case was crucial to the nurses
- It helped them to feel effective and have confidence in working out what was happening with a patient whose condition whom they were concerned about.
- It ensured that escalation of care took place in order to keep the patient safe and for action to be taken in response to the changing condition.
- It seemed to be a long process, especially when faced with vague, subjective, instinctive and unclear data.
 - Is this true?
- What strategies do you use to be believable when seeking help?

Routine Day

- Decision-making is led by reliance on routine, protocol, such as the PAR score, and technology.
- Nurses stay within their professional boundaries, competency level, professional role or where they perceived themselves in the hierarchy
 - What do you use to guide your decision-making on a normal day?

Unexpected Events - Actions

- Increase the frequency of the observations
- Frequently check the patient
- Move the patient nearer the nurses' station in close proximity
- Introduce monitoring and technology
- Seek help
 - Is this true?
 - Who do you refer to?
- What guided your decisions (PAR, protocols)?
- How does this feel when you are worried?

Unexpected Events – cont'd

- Feelings of lowliness or low self-esteem about your abilities. (Expressed by junior staff)
- Lacking confidence
 - How does this make you feel?
 - What do you do?
 - Is experience a factor?
 - If so how?

Being Believable

- Being believable was fundamental to the way participants built their case. It was the cornerstone of their efforts and was vitally important to them. It related to professional self-esteem because if they felt they were not being believed or convincing colleagues adequately their self-esteem was lowered along with changes in their confidence of their own findings. This affected the way people responded to their concerns and in some cases caused delays for the patient.
 - How do you make yourself believable?
 - What do you use to make your case believable?

Hunches

- Nurses informed many different people of their concerns. They drip fed information to a number of different staff.
- Most commonly a more senior colleague was approached.
- Advice was sought from the nurse in charge
- A referral was made to a specialist team such as the critical care outreach team.
- Sometimes there was a reluctance to do this when faced with a hunch that a patient was unwell if the patient did not fit the criteria as depicted in the PAR score for example.
 - What do you do?

Worried

- The picture developing in the clinical area was one of a crescendo growing as franticness developed
- More focus on the patient occurred
- More people were informed.

The consequence

- Either care was delayed due to the inability of the participant to persuade and convince, or there were timely actions
- It was particularly evident when concerns were vague
- It was more difficult to convince busy teams of the necessity to review the patient.

The role of Colleagues

- The consequence for the nurse included feelings of frustration, and in some cases further anxiety and doubt in their abilities and professional self-esteem.
- They needed to be in control to build a convincing case
- It appeared vital that they had confidence in their findings before they felt able to seek help, even though they tried to.
- They sought verification from colleagues and hunted for convincing evidence to persuade until action was taken.

The role of colleagues – cont'd

- Nurses try to establish whether what they felt was happening was genuine, accurate and real
- They decide whether it warrants informing the clinical opinion to more senior and more specialist and experienced staff in order to elicit help for the patient they were worried about.
 - Is checking your thoughts something you do?
 - How?
 - Why?
 - Does it give you reassurance?
 - Does it alleviate anxiety?

Checking hunches

- Nurses need to check out their hunches as part of their decision to seek specialist help.
- They like to share this concern with members of the team.
- They need to feel in control
 - When have you felt like this?
 - Describe what you do

Gaining Control, Feeling out of Control

- When do you feel confident caring for a patient who is deteriorating?
 - What actions do you take?
- When do you feel out of control when caring for a sick patient?
 - What actions do you take?
- What effect does all this have on patient care?

Out of Hours

- There are delays in care and sometimes calls to the teams were not answered.
- There is a sense that nurses have to 'make do' in less than optimal circumstances.
 - How do you get help at night?