Understanding the process of nurses' recognition and response to patient deterioration

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Author's Declaration

This thesis is submitted to Liverpool John Moores University in support of my application for the degree of Doctor of Philosophy. This has been composed by me and has not been submitted in any previous application for any degree.

Signed  Date 21st December 2022

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Abstract

Background: nurses play a crucial role in the early recognition and management of the deteriorating patient, as they are responsible for the care they provide to their patients (Hogan et al., 2019; Connor et al., 2020; Burdeu et al., 2021). A part of this care is the monitoring of the patient's vital signs, such as blood pressure, pulse, respiratory rate, and temperature, which are fundamental in the surveillance of health deterioration.

The aim of this study was to understand the process of nurses' recognition and response to patient deterioration in more detail.

Methods: a generic, qualitative approach was adopted (interpretive description), guided by the work of Thorne et al., (1997) and used as the methodological framework. The theoretical perspectives used to underpin this study were Benner's (1984) work from "novice to expert", which focuses on intuitive perception and clinical reasoning in nursing, and the Cognitive Continuum Theory, developed by Hamm (1988) and revised by Standing (2008) to enhance the understanding of how nurses formulate their decisions to escalate the patient's care.

Data collection: data were collected using semi-structured interviews, a simulation exercise, and four focus groups. The total number of participants recruited was 46.

Phase One in-depth interviews (*n*=10)

Phase Two simulation exercise (*n*=20)

Phase Three focus groups (*n*=16)

The participants were nurses working within an acute NHS Trust and were equally represented from inpatient medical and surgical wards. They were recruited based on their experience of nursing the deteriorating patient.

Results: numerous themes emerged in **Phase One**, which were as follows: main themes (1) Collegial relationships; (2) Intuition; and (3) Interpretation of the NEWS system (National Early Warning Score). Several subthemes included clinical credibility, confidence, competence, knowledge, decision-making and organisational culture. The main themes constructed within Phase One, also emerged within the two other phases, providing a consistent theoretical link between all three phases of the study. A simulation exercise, which

replicated the five stages of an actual Medical Emergency call, was developed to aid data collection in **Phase Two.** This exercise identified the importance of experiential and theoretical knowledge when used in combination to recognise early warning cues of health deterioration. Barriers to this process were acknowledged, which included difficulties faced by the participants when attempting to escalate the patient's care. Finally, their deficiency of theoretical knowledge was emphasised by the participants, which exposed their own self confidence in their ability to challenge the requested medical review process of patients. **Phase Three** yielded some fresh insights and revealed a widespread acceptance in terms of the content and delivery of this unique simulation.

Conclusion: This study provides a meaningful understanding of the process of nurses' recognition and response to patient deterioration, by facilitating an insight into the hidden narrative surrounding this practice. Unlike other studies within this field of inquiry, this study focuses on the importance of this narrative to explain why this practice prevails, in addition to highlighting the potential remodelling of some aspects of this care to improve patient outcomes. Moreover, this study questions the literature in terms of whether nurses are missing cues of patient deterioration as reported, suggesting their voice is simply lost within this convoluted process, offering a different focus to direct future research within this field of inquiry.

Acknowledgements

Firstly, I would like to thank my supervisors, Drs A Malin, John Harrison, Julie-Ann Hayes, and Conan Leavey, for their tremendous encouragement, academic expertise, support, and kindness throughout this period of study. I would also like to thank the participants, who kindly gave their time and shared their knowledge and enthusiasm. Without their contributions, the study would not have been possible. I am extremely grateful to both the NHS Trust and Liverpool John Moore's University for their ethical guidance during the study and for allowing use of their facilities. This helped me foster a confidential and professional arena in which to conduct this research.

A huge thank you must go to my husband John and my family, all of whom who have supported me emotionally through some difficult personal circumstances along this long journey, and who have sacrificed a great deal of family time to enable me to complete this work.

Finally, I would like to dedicate this thesis to the memory of my late parents Veronica Ann Dalton, and Christopher Joseph Dalton, who always believed the impossible is achievable, despite the odds. From a young age, they inspired me to follow and accomplish my dreams and aspirations.

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Glossary of key terms and abbreviations

ANP: An Advanced Nurse Practitioner is an autonomous practitioner skilled in the delivery of acute care. Their role is to ensure timely intervention for the deteriorating patient and bestowing interventions to prevent further deterioration and escalating to the appropriate level of care.

BP: Blood pressure measurement.

Cardiac Arrest: Cessation of spontaneous circulation.

CPR: Cardiopulmonary resuscitation.

CCOT: Critical Care Outreach Team, developed in the UK, is a group or individual with specialist critical cate skills who attends the deteriorating patient after activation response through the track and trigger system.

DOH: Department of Health.

EWS: Early Warning Score (track & trigger system).

HDU: High Dependency Unit – Level 2 care.

HR: Heart rate.

ICU: Intensive Care Unit.

ICS: Intensive Care Society.

MET: Medical Emergency Team, like CCOT although led by a physician with critical care experience, developed in Australia and the USA.

MEWS: Modified Early Warning Score, an early version of the track and trigger system developed in 1995 in Australia.

NCEPOD: National Confidential Enquiry into Patient Outcome and Death.

NEWS: National Early Warning Score, introduced by Royal College of Physicians (2012) to act as the national track and trigger system within the UK.

NICE: National Institute for Health and Clinical Excellence.

RCN: Royal College of Nursing.

RR: Respiratory rate.

RRT: Rapid Response Team; a generic term used in the USA to describe the specialist team who attends a deteriorating patient.

RRS: Rapid Response System; an internationally recognised generic term for the hospital-wide team approach used to attend to the deteriorating patient once activated by the track and trigger system.

TTS: Track and trigger score; a generic term used to refer to an early warning scoring system

Vital signs: Routine observations that include measurement of physiological parameters, such as HR, RR, BP, temperature, and oxygen saturation.

VPS: Virtual patient simulation.

Chapter 1: Introduction to the research study

1.1 Background

Over the past two decades, caring for the deteriorating patient in hospital has become increasingly challenging for health care organisations around the world. As patient acuity is intensifying, the need to improve patient safety in hospitals is of paramount Importance. Nurses form one of the largest groups of employees who can assess the needs and conditions of patients, aided by completing vital sign recordings as well as getting to know the patients. Consequently, the role of the nurse is central in determining and recognising the deteriorating patient and is key in identifying changes and escalating their concerns. Despite this, ambiguities exist surrounding the responsibility of the nurse and the assessment of the patient's acuity (Steen, 2010; Smith and Aitken, 2016; Hogan et al., 2019).

The aim of this study was to understand the process of nurses' recognition and response to patient deterioration in more detail. This thesis investigates nurses' reports of their subjective opinions when caring for the deteriorating patient, highlighting their attitudes and beliefs by giving them the opportunity to reflect on their own experiences. Both retrospective and prospective accounts of patient assessment are discussed. By exploring the nurses' assessment process of the deteriorating patient in more detail, the complexities and the wide-ranging hidden influencing factors are revealed. The constructive themes identified share some similarity to those found within the literature, however, this study offers additional themes constructed within each of the phases contributing to the knowledge in this field of inquiry. This study, unlike other studies within this field, offers the narrative required to aid a deeper understanding of those factors identified, suggesting an issue with the process that either inhibits or encourages nurses' responses to patient deterioration, leading to the question "are nurses missing cues of patient deterioration, as reported." This question has been acknowledged and answered within the limitations of this study.

This chapter presents the research context. It begins by discussing what constitutes acute illness and clinical deterioration. The rationale, research question, aim, objectives, methodology, and an outline of the thesis are introduced.

1.1.2 Definitions of acute illness and clinical deterioration

The focus of this research was to explore and understand the process of how nurses assess patient acuity, and how they respond to acute clinical deterioration of the ward-based patient. Therefore, it is crucial to understand what is meant by "acuity" and "clinical deterioration."

The *Oxford English Dictionary* defines the adjective 'acute' as an unpleasant or unwelcome situation or phenomenon that manifests itself to a severe or intense degree. Brennan and Daly (2009) suggest patient acuity is viewed in respect of the speed and onset of illness , and in terms of the severity of physiological instabilities, injury, and intensity. The concept of acute care has been defined as "an evolving, predictable, and symptomatic process of worsening physiology towards critical illness" (Lavoie et al., 2016, p. 71).

The *Oxford English Dictionary* defines 'clinical' as relating to the observation and treatment of actual patients, and the noun 'deterioration' as a process of becoming progressively worse. Jones et al., (2013, p. 1,030) described clinical deterioration as

> *A patient who moves from one clinical state to a worse clinical state which increases their individual risk of morbidity, including organ dysfunction, protracted hospital stay, disability, or death.*

Despite few definitions of patient deterioration, several national and international studies have highlighted the consequences of this condition (McQuillan et al., 1998; Quirke et al., 2011; Allen et al., 2017; Anesi et al., 2017).

1.1.3 Research context

The acuity of patients managed in general hospital wards has amplified in recent years. Access to higher level care, such as that found in a High Dependency Unit (HDU) or Intensive Care Unit (ICU), has become ever more problematic (Athifa et al., 2010). Table 1 illustrates the levels of patient care delivered in hospitals in the UK. Despite the escalating demands for ICU beds, the ratio of available ICU beds remains low when compared to the rest of Europe. This leaves a high number of patients with complex needs being nursed in acute ward environments (Hogan et al., 2019).

Clinical deterioration of the patient's health care needs could potentially occur at any stage of the patient's illness and stay within the hospital environment. A study by Ludikhuize et al., (2012, p. 424) suggested that physiological changes in patients' vital signs are often missed, misinterpreted, or left unmanaged, which frequently results in patients experiencing

a potentially life-threatening, adverse event (Mapp et al., 2013). The current risk strategies have tended to focus on education, recognition, and response of failing vital signs, which will be discussed in more detail in Chapter 2. Tools such as track, and trigger systems are utilised. These are often referred to internationally as the Modified Early Warning Score (MEWS) or within the UK as the National Early Warning Score (NEWS). These can be defined as aggregate scoring systems, in which scores are designated to the individual's physiological measurement and then weighted against pre-selected score thresholds (Gao et al., 2007; McDonnell et al., 2013).

Level 0 – Ward level	Patients requiring ward-based care
Level 1a – Ward level	Patients at risk of deterioration or those relocated from a higher level of care.
Level 1b – Ward Level	Patients who are physiologically stable but are dependent on nursing care
Level 2 – HDU	Patients requiring detailed observations and interventions including single organ failures or patients stepping down from a higher level of care
Level 3 – ICU	Patients requiring advanced respiratory support alone or together with the support of at least two organ systems

Table 1: Levels of care required by patients in acute hospitals across England and Wales (Department of Health, 2000, 2007)

The health care providers have policies to guide staff in the recognition and expected escalation response. Many healthcare providers worldwide have developed a Rapid Response Team (RRT), which is available 24/7 to ensure the patient receives an immediate response to the detected medical emergency. This is depicted by the rising numerical score captured within the MEWS/NEWS system (Ludikhuize et al., 2012; Mapp et al., 2013). Within the UK, there are variations in the teams designated to act as the RRT, such as Medical Emergency Teams (METs) or Critical Care Outreach Teams (CCOTs) or sometimes a combination of both (DH, 2000, 2007; Berwick et al., 2006). The USA, Australia and parts of Europe have adopted the MET response as the RRT (Lee et al., 1995; McGinn et al., 2011). Embedded within the RRT is an assumption that its activation will improve collaboration between professionals and result in improved clinical practice and patient outcomes, by delivering treatment intervention on the ward to prevent further deterioration (McGinn et al., 2011). Despite the implementation of the RRT, there is compelling evidence to suggest that opportunities to detect a patient's clinical deterioration continue to be missed (Mok et

al., 2013; Cooper et al., 2011). Since the early 1990s, studies investigating the care of the deteriorating patient have consistently highlighted issues in relation to the late recognition of symptoms and subsequent delay in the escalation of care. The seminal works in this field are Schein et al., (1990), McQuillan et al., (1998) and Hillmans et al., (2002). The contemporary literature acknowledges the replication of themes found in these seminal studies, as illustrated by Stubbings et al., (2012), Cooper et al., (2011), Massey et al., (2014), and Hogan et al., (2019).

1.1.4 Rationale for the study

This research originated initially from my own concerns as an Advanced Nurse Practitioner (ANP) working as part of the Medical Emergency Team (MET). Since the initiation of this research project, I have attended over 16,432 MET calls relating to a deteriorating patient. In working closely with the ward staff, I have observed some patients exhibiting signs of clinical deterioration in the absence of a medical review or treatment plan, prior to the MET call. This raised my concerns, I probed the literature within this field of inquiry to discover there is widespread evidence suggesting ward nurses are failing to recognise and respond to patient deterioration (Cioffi, 2000; Andrews and Waterman, 2005; Cooper et al., 2013; Cardona-Morrell et al., 2016).

1.1.5 Research gap

Understanding if, or more importantly why, "nurses are failing to recognise and respond to patient deterioration" has not been extensively studied. Following completion of an extensive literature review, I learned that this area of inquiry had focused upon the failure of nurses to recognise and respond to patient deterioration. Some of the studies have identified influencing factors that may contribute to this level of practice but offer little explanation as to why, with some of the more contemporary studies suggesting that, despite the widespread evidence, this practice prevails (Chung et al., 2018; Connor et al., 2020; Burdeu et al., 2021).

Informed by the literature, this guided my research question of wanting to know "why nurses are missing cues of patient deterioration." From this point I then formulated my own method of inquiry to explore this question in more detail. I focused on the initial recognition of symptoms, as the vulnerability of this process was the nurses' ability to detect the signs of clinical deterioration in the first instance. Subsequently, my focus shifted towards the escalation response, conceptualised in terms of timing and referral to the appropriate level of care.

1.1.6 Theoretical positioning

In assuming the roles of both researcher and clinician within this field of inquiry, I recognise the potential for research bias. Consequently, I have incorporated strategies to avoid this; these are highlighted in Chapter 4, p. 136 (Caelli et al., 2003; Silverman, 2000).

1.1.7 Theoretical Frameworks

This thesis draws on insights from seminal nursing theories, such as Benner's (1984) Humanistic-*intuitive decision model*, plus the *Cognitive Continuum Theory* in decision-making, developed by Hamm (1988) and then later revised by Standing (2008), both frameworks incorporate approaches to understand decision-making in nursing. The combination of both methods initially assists the understanding of intuitive decision-making chosen by the participants. However, *Benner's model* is questioned in relation to the utility of intuition in today's nursing world, versus the cognitive psychological approach (see Chapter 3, p. 74 for rationale for selection).

1.2 Research question, aim and objectives.

Following a deep dive into the literature, the research question underpinning this thesis is "are nurses missing cues of patient deterioration, as reported?" Therefore, the aim of this study was to understand the process of nurses' recognition and responses to patient deterioration in more detail.

1.2.1 Objectives

1. To identify perceived factors that may influence nurses' recognition and response to patient deterioration.
2. To explore barriers to this process and understand why nurses fail to appropriately escalate the care of the deteriorating patient.
3. To consider the impact of intuition, experiential learning, and knowledge on the effects of nurses' decision-making when escalating to a higher level of care.

1.2.2 Research design

The target population was generic registered nurses working in medical and surgical wards. Although the data collection process shared some similarities with more traditional approaches (Kahike, 2014; Percy, 2015), there was no specific allegiance to any of them.

This study was comprised of three distinct phases:

- Phase One: in-depth interviews with 10 participants.
- Phase Two: a simulation exercise with 20 newly selected participants.
- Phase Three: a series of focus groups with 16 participants who completed Phase Two.

All three phases will be discussed in more detail in Chapter 4.

Purposeful sampling ensured that nurses with experience of caring for the deteriorating patient were recruited (see inclusion criteria in Chapter 4, p.110). The interviews were completed as the nurses were on varying shift patterns, from days to night duty, to ensure consistency of the participants' experiences. This study utilised a Virtual Patient Simulation (VPS) to demonstrate the nurses' process of assessing patient acuity (see Appendix 1, p 277). The VPS is based upon a real-life medical emergency extracted from my own clinical experience. The detail in the VPS is anonymised and the content was validated by both senior medical and nursing staff for accuracy and validity.

1.2.3 Methodology: interpretive description

An interpretive descriptive approach was taken for this study, guided by the work of Thorne et al., (1997). This inquiry relates to an area of clinical practice which is both complex, and emotive, involving patient deterioration as experienced by the participants. Therefore, the selected methodology required a more flexible approach to explore the clinical mind, to aid a deeper understanding of this complex, experiential clinical process, rather than just being satisfied with the pure description. This extended beyond the boundaries of the more traditional approaches; hence, my selection of Interpretive description (See Chapter 4, p.100-101 for a more detailed rationale).

1.3 Timeframe of the study

I commenced part-time doctoral studies in March 2014 at Liverpool John Moores University. Data collection for the first phase began in March and was completed in April 2016. No data were collected between May 2016 and January 2018, as there was a delay in the completion of the transfer document due to personal health-related issues. The second phase recruitment began following a successful transfer registration from MPhil to PhD studies in February and was completed in October 2018. Following further ethical approval in February 2019, the third phase commenced in March and was completed in August 2019. There was a delay in submission of this thesis due to the evolving pandemic COVID-19. The thesis was submitted on 21st December 2022 for examination.

1.4 Structure and content of the study

Chapter 1: Introduction

This thesis is comprised of seven chapters. This first chapter introduces the study by detailing the broad context of the research, offering definitions of acute illness and clinical deterioration, before going on to clarify the rationale for the study and identifying the research gap. The theoretical positioning and the underpinning for the study are briefly described, together with the aim, objectives, and research design. Interpretive description is introduced as the selected methodology and, finally, the thesis structure is presented.

Chapter 2: Literature Review

The methodological process driving the literature review is explained, together with the findings from the literature pertaining to the deteriorating patient. This situates the study in a broader context. Gaps within the literature are highlighted to rationalise the study.

Chapter 3: Theoretical Frameworks

This chapter describes how the theoretical frameworks provide the essential scaffold upon which this thesis is built. The emphasis is on explaining the theoretical concepts, highlighting their relevance and, more importantly, explaining why they were chosen. These theories are related to existing literature, clarifying the differential of similar applications to my own.

Chapter 4: Methodology

This chapter conveys how all elements of the research design are compatible with the chosen generic approach of interpretive description. Qualitative data collection methods are described, before then going on to explain my epistemological and ontological positions, plus demonstrating how an ethical approach was applied to all aspects of the research process.

Chapter 5: Findings

This chapter introduces the findings from all three distinct phases of the study, opening with the themes identified in Phase One. The illustrations provide the associated thematic linkages between the main, and various sub-themes which are presented at the latter part of this Chapter. The extracts from the transcribed interviews describe and explain how the participants claimed to utilise their intuition and experiential knowledge to recognise the deteriorating patient. This created a platform to propel the difficulties encountered by the participants when attempting to escalate the patient's care. The data presented highlights

the impediments faced by the participants directly from those initiatives set up to improve the recognition and response process.

Chapter 6: Discussion

The findings are discussed in detail considering the literature reviewed. Alongside this, aspects that add meaning to this study are highlighted. Exactly how this study improves our understanding of the existing theories is discussed.

Chapter 7: Conclusion and Recommendations

This final chapter conveys the strengths and limitations of the research. The aim and objectives are revisited considering the overall findings of the study. The thesis concludes with recommendations for practice, education-based simulation, and future research.

1.5 Summary

This chapter has provided contextual background on the phenomenon under investigation. I defined the key terms, highlighted the research design, stated the rationale of the study, discussed the main aim and objectives, and introduced interpretive description as the methodology deployed. Finally, I have outlined the structure of the thesis. The following chapter presents the findings of the literature review, further contextualising the study and highlighting the gaps in the literature to justify the research.

Chapter 2: Literature Review

2.1 Introduction

This chapter presents the background literature to illustrate what is known about the process of ward nurses' recognition and response to patient deterioration. This field of inquiry is dominated by research focusing on the outcomes of care, highlighting systematic errors leading to adverse patient events. The literature illustrates the failure of nurses to recognise or respond to patient deterioration. However, it offers little explanation as to why this process is repetitively failing. As a clinician working within this field of inquiry, I have been mindful not to focus solely on the clinical domain, as there are numerous factors reported to influence ward nurses' recognition and response to deterioration. The following characterises those factors identified from the literature, which will be discussed in more detail towards the latter part of this chapter.

2.1.2 Factors influencing nurses' recognition and response to deterioration.

- Patient assessment and negative emotional response.
- Intuition and knowing the patient.
- The practice of vital sign monitoring and Early Warning Score (EWS).
- Communication and accessing support.
- Relationships between doctors and nurses, and the organisational culture.
- Decision-making skills, plus education and training.

The context of patient deterioration introduces this chapter before a brief discussion on the identified problem and search strategy. The quality of the literature was assessed using the Mixed Methods Assessment Tool (MMAT) by Hong et al., (2018), which is discussed further within this section. An independent reviewer and I appraised each article to reduce the potential research bias. This is one of the selected verification strategies employed within this study, which is discussed in Chapter 4, p. 136. The PRISMA statement (Preferred Reporting Items for Systematic reviews and Meta–Analyses), guided by Elliot et al., (2017), was used to structure the search and report the findings. The system used to monitor vital signs is commonly referred to as a Modified Early Warning Score (MEWS), or Early Warning

Score (EWS) internationally. In 2012, the Royal College of Physicians (RCP) replaced MEWS with a National Early Warning Score (NEWS), as there were inconsistencies within different Trusts within the UK. Therefore, for the purpose of this study, I refer to both as EWS from this point onwards. This is a generic term used to describe both systems internationally (RCP, 2012; McDonnell et al., 2013).

2.1.3 Context of patient deterioration

The past decade has seen an interest in the management of the deteriorating patient and outcomes of care. Much of this interest has stemmed from findings identifying the failure of ward nursing staff to recognise and respond to patient deterioration (Liaw et al., 2011; Cooper et al., 2016). There is an array of literature providing insights into failing patient safety systems worldwide (Franklin and Mattew, 1994; DOH, 2000; Buist et al., 2002) that is both substantial and repetitive in terms of outcomes. My aim, therefore, is to offer a short synopsis to emphasise the problem before moving on to the more specific elements relating to this literature review.

The lack of recognition and response in a timely manner has led to an increased number of hospitalised patients experiencing adverse events and requiring a higher level of care (Jha et al., 2013). This has prompted the resuscitative and intensive care specialists to concentrate on the care and management of the deteriorating patient in general ward areas. The evidence conveyed a clear message: this practice required attention. Indeed, authors in this field emphasised that many patients experienced cardiopulmonary arrest prior to admission to ICU (Intensive Care Society, 2002; Anesi, 2017). The findings suggest that if interventions needed to stabilise the patient were deferred, the risk of mortality was significantly elevated. This level of care has been defined as suboptimal care (McQuillan et al., 1998; Ludikhuize et al., 2012; Allen et al., 2017).

2.1.4 Suboptimal care

The term suboptimal care was first studied in the UK by McQuillan et al., (1998) to appraise the quality of care given to patients prior to admission to ICU, and this research is cited in much of the literature pertaining to this field of inquiry. Suboptimal care has been defined *as:*

> *Failure to seek and provide appropriate and timely interventions to at risk patients (Massey et al., 2009, P 171).*

It is linked to a failure to recognise cues indicating that a patient is deteriorating (Quirke et al., 2011). McQuillan et al., (1998) examined the consequences of suboptimal care in 100 patients prior to admission to ICU. They concluded that 54% of the patient sample had received suboptimal care. McGloin et al., (1999) conducted a similar study with a larger sample of 477 unexpected patient deaths, which also included 98 ICU admissions. The findings reflected those identified within the study of McQuillan et al., (1998). More than a third of patients admitted to ICU experienced suboptimal care, and the mortality rate was higher within the identified suboptimal group. Seward et al., (2003) retrospectively reviewed 200 consecutive patient deaths and found that there were delays to diagnosis and treatment in 64% of the cases.

A later study completed by the National Confidential Enquiry into Patient Outcome and Death (NCEPOD, 2005) describes failings and delays in the recognition and initiation of first-line treatment for critically ill patients. This study identified that many patients had a degree of physiological instability on the wards for prolonged periods of time prior to admission to ICU. This finding is supported by other studies (Cardoso et al., 2011; Allen et al., 2017; Hogan, 2019). This study concluded that 21% of the deaths could have been avoided had there been appropriate assessment and interventional treatment available. This was a large national audit of cases across 229 hospitals within the UK, with a study population of 1,677 patients.

NCEPOD (2007) discovered similarities when they audited emergency admissions in 233 hospitals within the UK, again with a significant sample population of 1,275 patients. The findings highlighted unacceptably poor levels of clinical assessment, consultant reviews, limited involvement of critical care services, and inadequate recording of patients' vital signs.

Quirke et al., (2011) conducted a literature review surrounding suboptimal care and specifically sought to clarify the reasons why, and how, suboptimal care continues to prevail. The findings mirrored that of preceding studies, with a difference associated with workforce shortfalls and educational-related factors. Several studies have discovered that serious adverse events were often the reason for unplanned admissions to ICU (Cardoso et al., 2011; NCEPOD, 2012; Volchenboum et al., 2016). In many cases, these adverse events would have been avoidable had the physiological warning signs been recognised along with an appropriate escalation plan of care instigated (Allen et al., 2017; Anesi, 2017; Hogan et al., 2019).

2.2 Method

An integrative review method was used to summarise and critique the literature, allowing for the use of various sources of literature. Whittemore and Knafl's (2005) systematic framework was applied to enhance the rigour and offer guidance of this review. This model contains five stages. I adapted the model to accommodate an additional stage (the search strategy), resulting in the following six stages: (1) formulation of the problem, (2) search strategy, (3) literature search, (4) evaluation of data, (5) data analysis, and (6) presentation of results. The stages of this review are consistent with this framework.

2.2.1 Formulation of the problem

Nurses are front-line responders and play a pivotal role in the recognition and response to patient deterioration. This is achieved by using a combination of methods, such as: vital sign monitoring, interpretation of the physiological parameters, knowing the patient, recognition of health decline, and intuition, all of which will be discussed in more detail. There is an increasing body of evidence known as "failure to rescue," in which nurses are acknowledged to miss cues of deterioration and often fail to escalate the care of the patient appropriately (Purling and King, 2012; Cooper et al., 2013; Massey et al., 2014).

The reasons why ward nurses fail to recognise and respond to patient deterioration have not been extensively studied. There is clearly a need to understand the factors associated with this recognised failure by ward nurses. Therefore, by exploring this complex problem in more detail, I identified this as a gap in the literature, and from this, I developed the research question, aim, and objectives for this study. As mentioned in Chapter 1, the following is a reminder of the definition of a deteriorating patient, as used for this study:

> *A patient who moves from one clinical state to a worse clinical state which increases their individual risk of morbidity, including organ dysfunction, protracted hospital stay, disability, or death (Jones et al., 2013, p. 1,030).*

The aims of the search were to:

- Identify empirical studies relating to the process of ward nurses' recognition and response to patient deterioration.
- Critically evaluate those studies that illustrate or consider the practice of ward nurses' recognition and response to deterioration.
- Raise questions where little evidence exists and recognise disparities in the literature.

2.2.2 Search strategy

In July 2014, an initial search of the literature was conducted. This process was replicated yearly to yield additional research. Two search strategies were employed at each point to enhance the quality of this literature review, with the first search strategy informing the second (Whittmore and Knafl, 2005). The search engines were selected owing to their coverage of the wide-ranging topics. Table 2 details the search engines utilised. The first search strategy involved a search of the Cumulative Index of Nursing and Allied Health Literature (CINAHL), the Cochrane library, Medline Embase, and the British Nursing Index (BNI) using the key words highlighted in Table 3. The use of key words helped focus the search to the perceived problem of inquiry. The second search strategy involved a manual search through the reference lists of the recovered full-text articles to find other literature not previously identified within the first search. An additional three articles were identified using this method.

Adapted from – De Brun (2013) Information Standard of useful databases
CINAHL – Covers a wide range of topics, including nursing, biomedicine, health science
Cochrane library – Six databases containing high-quality evidence to inform healthcare.
Embase – European version of medicine containing articles on medical and pharmacology research.
Medline – 22 million citations from biomedical literature.
BNI (British Nursing Index) – Leading UK database for support of practice, education, and research for nursing, midwifery, and health providers. Plus, this also links to ProQuest and other international journals.

Table 2: Search engines

<table>
<tr><th>Steps</th><th>CINAHL = 323</th><th>Cochrane library = 231</th><th>Embase = 83</th><th>Medline = 47</th><th>BNI = 88</th></tr>
<tr><td>Step 1</td><td>Nurse + recognition + deterioration + vital signs</td><td colspan="4" rowspan="5">The search strategy of ALL databases replicated the same steps 1-5 as described under the CINAHL search to provide consistency</td></tr>
<tr><td>Step 2</td><td>Nurse + clinical deterioration + Pre-arrest</td></tr>
<tr><td>Step 3</td><td>Nurses + wards + deteriorating patient</td></tr>
<tr><td>Step 4</td><td>Ward nurse + warning signs</td></tr>
<tr><td>Step 5</td><td>Patient deterioration + recognising + responding</td></tr>
<tr><td colspan="6">Limitations of review: a start date of 1998, written in the English language, ward nurses, and specialty.</td></tr>
</table>

Table 3: Search strategy of databases

2.2.3 Inclusion and exclusion criteria

There were no restrictions placed on the research design of the selected studies used in this review. The studies that focused on trained nurses' recognition and response to the deteriorating ward patient were included. Those studies evaluating the track and trigger and rapid response systems were excluded. This was owing to their detailed focus purely on the mechanism of failure. Similarly, areas of speciality, such as accident and emergency, critical care, paediatrics, and maternity care, were excluded owing to the use of specialised equipment and education given to monitor the potential deteriorating patient. In addition, the increased staff/patient ratios within these areas would not reflect the reality of the generic ward environment, which is applicable to this study. Studies from 2000 to 2023 were included. Table 4 displays the selected studies by author, year, and country of origin, with the UK and Australia leading this research. Therefore, the differences in healthcare delivery and systems have been considered. The concept of the deteriorating ward patient

was first identified by Mc Quillan et al. (1998). This highly regarded seminal paper prompted changes to the care and management of the deteriorating ward patient and provided a focus for future research within this field of inquiry. As such, studies prior to this date were excluded, for they would have little relevance to contemporary practice (Hayes et al., 2000).

United Kingdom	***Australia***
Andrews and Waterman (2005); Cox et al., (2006); Wheatley (2006); Hogan (2006); Donohue and Endacott (2009); Rattray et al., (2011); McDonnell et al., (2013); Smith and Aitken (2016); Azimirad et al., (2020); Smith et al., (2021); Burke & Conway, (2022); Fazzini et al., (2023). **Total = (12)**	*Cioffi (2000); Endacott and Wesley (2006); Endacott et al., (2007); Mitchell et al., (2010); Cooper et al., (2011); Cooper et al., (2013); Massey et al., (2014); Cardona-Morrell et al., (2016); Minyaev et al., (2021).* ***Total = (9)***
United States of America	***Netherlands***
Minick and Harvey (2003); Gazarian et al., (2010); Hart et al., (2014); Dresser et al., (2023). ***Total = (4)***	*Ludikhuize et al., (2012); Douw et al., (2016)* ***Total = (2)***
Greece	***Singapore***
Pantazopoulos et al., (2012). ***Total = (1)***	*Chua et al., (2013); Chua et al., (2020); Chua et al., (2022) .* ***Total = (3)***

Table 4: Number of studies, author, year, and country of origin

2.2.4 Literature search

The databases searched were automatically generated from Cross Search, which revealed remarkably high numbers of citations. The second wave of exploration revealed that several citations were repetitive, and a small number of studies complied with the inclusion criteria. An illustration of this, utilising the PRISMA-style flow diagram and displaying the results of the search, can be seen in Figure 1. Elliot guided this process et al., (2017) and presented using the PRISMA flow diagram adapted by Moher et al., (2009). The initial search generated 780 records, with an additional 3 records added, 39 records were

duplicates and consequently removed. An independent person and I screened the title and abstracts of 744 records, of which 672 failed to meet the inclusion criteria. After a discussion, the remaining 72 full-text articles were assessed for eligibility. A further 41 records were excluded, with the reasons for this mentioned within the PRISMA statement, an updated search revealed additional 8 records leaving a total of 31 studies to be included within the review

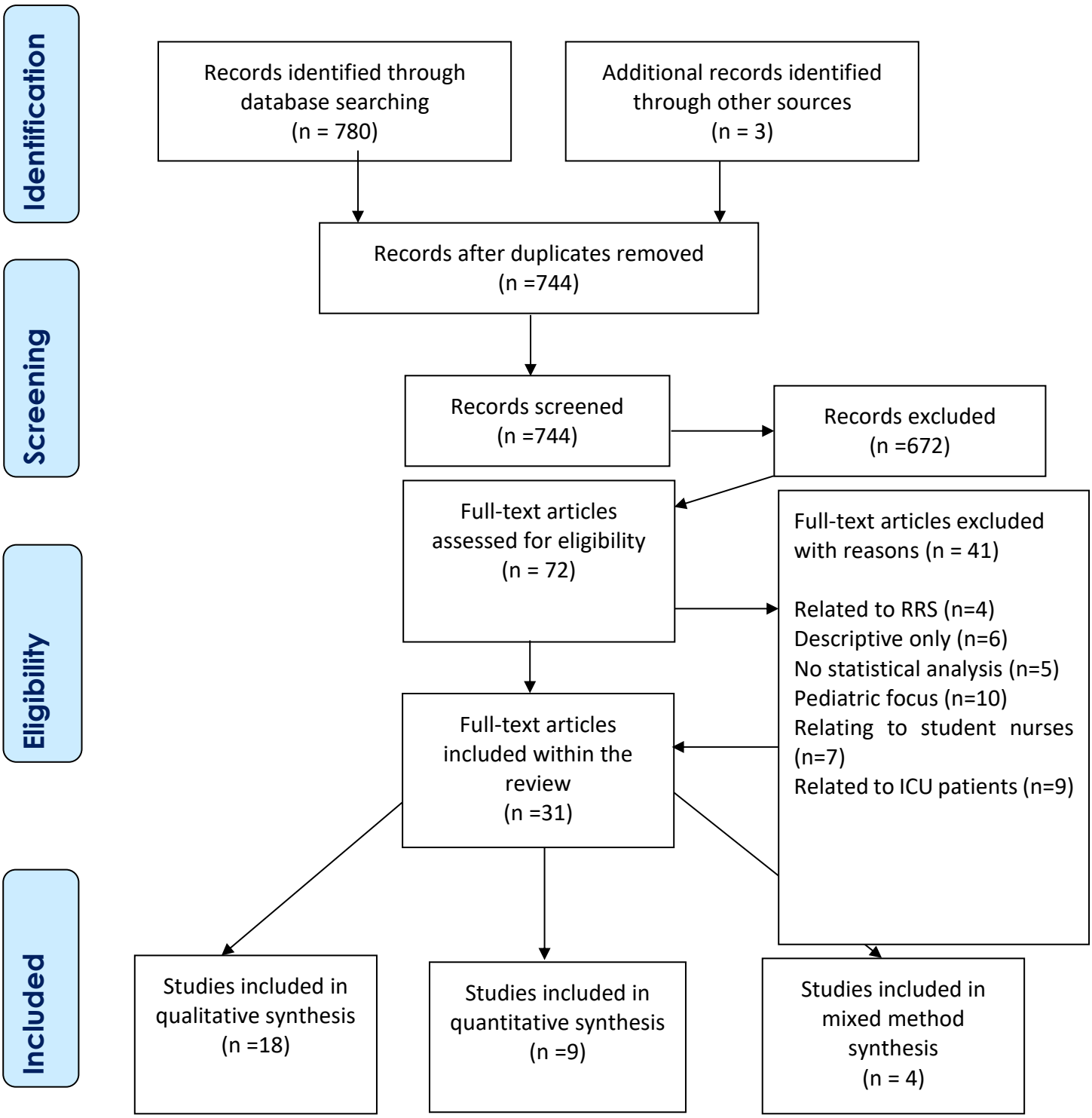

Figure 1: Nurses' recognition and response to patient deterioration. The PRISMA–style flow diagram adapted from Moher et al. (2009)

2.2.5 Data evaluation

The qualities of these studies were assessed using the Mixed Methods Assessment Tool (MMAT). This system enables an assessment of qualitative, quantitative, experimental, and mixed methods research, allowing the researcher to assess the validity and reliability of the selected studies. According to Hong et al., (2018, p 287) the researcher is discouraged to calculate an overall score based upon the criterion, alternatively I was encouraged to seek a detailed presentation of the ratings to inform the quality of the studies.

The independent reviewer, as mentioned earlier, was a senior nurse recruited from the host Trust, who was not involved with the study. She appraised each study, along with me, using the MMAT criteria. A third person was available if needed, specifically if both reviewers could not reach a consensus following this process. There was variation in ward settings and most of the researchers were found to examine more than one ward, which, in turn, enhanced the credibility of their research. The studies explored registered nurses' views and experiences of recognising and responding to patient deterioration, apart from one study, Chua et al., (2013), which studied the experiences of enrolled nurses. Table 5 illustrates the data extraction taken from the studies and used to inform the literature review.

Table 5: Data extraction table

Author Year Country	Aim	Sample	Research design	Analysis	Findings
Andrews & Waterman (2005) UK	Explore how staff use vital signs and warnings to package deterioration.	44 participants 30 RN's, 7 Drs, 7 HCAs. Theoretical sampling.	Grounded theory, interviews, and participation observation.	Grounded theory open & selective coding.	Three categories: 1. Making credible. 2. Grabbing attention. 3. Packaging deterioration.
Azimirad et al (2020) UK & Finland	Examine nurses' attitudes as part of a clinical competence towards the RRS in two acute hospitals.	388 RNs from medical and surgical wards.	Cross -sectional correlation study.	Descriptive statistics. Mann – Whitney. Kruskal-Wallis tests. Chi Square and multivariate regression analysis.	Nurses had a positive attitude towards RRS. More than half perceived the physicians influence as a barrier to escalation. Finnish Nurses relied more upon intuition and were more likely to activate the RRS. Nurses' attitudes towards physician influence and

					intuition needs to be improved through continuing development of clinical competence.
Burke & Conway (2022) Ireland	To identify and synthesize data from qualitative studies which examine factors influencing nurses' escalation of care in response to patients' EWS.	18 studies from 7 countries including 235 nurses.	Systematic Review of the literature.	Thematic analysis. RETREAT framework.	Four themes emerged: 1. Marrying nurses' clinical judgment with EWS. 2. SMART- communication. 3. EWS protocol: blessing and a curse. 4. Hospital domain.
Cardona & Morrell (2016) Australia	To establish a profile of nurses' vital signs monitoring practices.	42 RNs the study team observed 441 patient vital sign interactions performed by nurses.	Observational cross -sectional design. Unobtrusive observation and recording nurses monitoring practices.	Content analysis. Descriptive statistics were used to calculate frequency data.	The selection of appropriate vital signs appears to rely on nurses' clinical judgments rather than mandated timings. Prevalence of incomplete sets of vital signs limits identification of patient deterioration.
Chau et al (2013) Singapore	Explored the experiences of Enrolled Nurses in peri-arrest situation to identify strategies to enhance the care.	15 Enrolled Nurses who had experience of caring for the deteriorating patient.	Qualitative exploratory descriptive study. Semi-structured interviews.	Critical incident technique.	Five themes emerged: 1. Recognizing deterioration. 2. Responding to deterioration. 3. Taking responsibility. 4. Educational developments. 5. Modifying clinical processes.
Chau et al (2020) Singapore	Explore the experiences of junior doctors and nurses escalating the care of the deteriorating patient.	14 RNs 10 Drs within a large acute general hospital with MET established.	Qualitative exploratory design. Interviews.	Thematic Analysis.	Three themes emerged: 1. MET activation Vs primary team Drs reviews. 2. Challenges in obtaining medical reviews. 3. Unspoken rules of the escalation of care.
Chau et al (2022) Singapore	Explore the collaboration experiences between Enrolled and Registered nurses in recognizing and responding to patient deterioration.	12 Enrolled nurses' 11 RNs in 1250 bed tertiary hospital.	Qualitative descriptive study. Semi-structured interviews.	Thematic analysis.	Three main themes were identified: 1. Reaching a collective understanding of patients' conditions. 2. Role expectations towards each other. 3. Lacking a shared decision-making process related to patient care.

Cioffi (2000) Australia	Describe the experiences of RNs calling for emergency assistance.	32 female RNs four wards in a teaching hospital and three wards in a peripheral hospital.	Qualitative exploratory descriptive study. Unstructured Interviews.	Thematic analysis.	Five themes: 1. Uncertainly with calling. 2. Identification of change in patients' condition. 3. Identification of at-risk situations. 4. Associated feelings. 5. Valuating MET.
Cooper et al (2011) Australia	Examine the ability of nurses to assess and manage patient deterioration within a simulated environment.	35 RNs working in a rural hospital on medical & surgical wards.	Exploratory quantitative survey.	Descriptive statistics spearman's rank, Pearson's correlation T-test.	Respiratory rate and CRT were most under assessed Vs knowledge and management of deterioration varied. Systematic assessment not used, single vital signs used, anxiety increased as SIM patient deteriorated, and this appeared to affect performance.
Cooper et al (2013) Australia	To assess the ability of RNs to manage deteriorating patients.	44 RNs 2 hospital wards. Convenience sample.	Quasi-experimental design. Pre and Post intervention assessments and observations performed to evaluate nurses simulated clinical performance.	Descriptive statistics as above.	Younger nurses scored higher in knowledge. Anxiety increased as the SIM patient deterioration this affected performance. SA was generally low (median = 50%). Teamwork ratings averaged 57% with a significant association with leadership. Following intervention participants reported a significant increase in knowledge, confidence, and competence.
Cox et al (2006) UK	Explore the influential factors surrounding the experience of trained nurses caring for critically ill patients on general wards.	7 RNs with a range of experience on one medical ward.	Qualitative exploratory descriptive study. Interviews.	Content analysis.	Five themes: 1. Clinical environment. 2. Professional relationships. 3. Patient assessment. 4. Feelings. 5. Education needs.
Donohue & Endacott (2009) UK	Examine processes use during patient deterioration.	11 nurses with experience of managing the deteriorating patient.	Qualitative, critical incident technique. Semi-structured interviews.	Thematic analysis.	Four themes: 1. Individual assessment. 2. The use of EWS to communicate deterioration. 3. Action taken. 4. Team process.

Douw et al (2016) Netherlands	To determine the significance of nurses,' worry and/or indicators underlying worry to predict unplanned patient adverse events.	96 RNs working on three surgical wards were included within the study.	Prospective co-hort study.	Descriptive statistics. Mann-Whitney, t-Test, Fishers extract test.	Development of the DENWIS- nurse worry indicator tool. Demonstrated by adding the EWS score to the DENWIS – worry indicator this improved prediction of unplanned ICU admissions.
Dresser et al (2023) USA	To describe medical -surgical nurses' perceptions of factors that influenced their clinical judgement in situations of patient deterioration.	20 RNs from 10 adult medical surgical units at an academic medical Centre.	Qualitative descriptive design. Semi-Structured interviews. Telephone interviews.	Content analysis.	Eight themes emerged: 1. Knowing the patient. 2. Experience matters. 3. Lots of small points make the system fail. 4. Making sense of the data. 5. Something does not go together. 6. Caught in the middle. 7. Culture of teamwork. 8. Increased workload.
Endacott & Wesley (2006) Australia	Examine strategies used by nurses to manage patients at risk of deterioration.	20 RNs completed the questionnaire. 7 RNs interviewed.	Qualitative case study design.	Content analysis.	Three factors identified: 1. Clinical skills. 2. Communication strategies. 3. Rural context. 50% of the sample were the first person to identify the deterioration.
Endacott et al (2007) Australia	Identify cues that ward nurses and doctors use to identify deterioration.	11 RNs, 14 Drs, 17 Chart audits.	Case study design.	Content analysis and Chart via descriptive statistics.	RNs and Drs relied upon EWS system to identify deterioration. RNs relied upon patients' physical assessment of patient capabilities compared to Drs who undertook a more structured approach. There was a lack of timely referral to more senior clinicians. The GCS and urine output was not charted at all.
Fazzini et al (2023) UK	To improve communication between teams, improve SA and reduce delay in escalation of care of acutely ill patients.	Medical Team. Critical Care outreach Team. Advanced Clinical Practitioners from a large tertiary.	Quality Improvement project safety briefing with a structured format.	Content analysis. Descriptive statistics.	A structured MDT safety briefing was developed and improved the safety and support management of deteriorating patients within the out of hour's period.

		trauma Centre.			
Gazarian et al (2010) USA	Describe cues and factors that influence the decision-making process used by nurses when identifying cardiac arrest in an acute care setting.	13 female RNs on four medical wards with experience of peri-arrest situation.	Qualitative descriptive study. Critical decision - making method.	Cognitive task analysis.	Cues identified to assess patients' risk: 1. LOC. 2. Oxygen status. 3. Systolic BP. 4. Knowledge of the patient factors that influenced RNs to take action. <u>Nursing characteristics</u>: 1. Previous experience of peri- arrest situations. 2. Ability to function as part of a team. <u>Organisational characteristics</u>: 1. Monitoring equipment. 2. Consultation with senior staff members. 3. Knowing, and valuing team members.
Hart et al (2014) USA	To explore and understand medical and surgical ward nurses' perceived self-confidence and leadership abilities as first responders in recognition and response to patient deterioration.	148 RNs working on medical and surgical wards in five different hospitals within the US. Convenience sample.	Prospective, cross- sectional descriptive quantitative survey.	Descriptive statistics. Pearson's correlation and regression analysis.	RNs reported moderate self-confidence in recognition, assessing and intervening during clinical deterioration. RNs reported moderate self-confidence when performing leadership skills prior to the arrival of the RRS.
Hogan et al (2006) UK	Exploring nurses' values and beliefs about patient monitoring, identifying factors that influence the organization of working practice. Finally, the theoretical and practical preparation nurses receive before embarking on vital sign measurement.	No number mentioned target population nurses, students, and healthcare assistants, all of whom record vital signs.	Qualitative description study. Focus groups.	Thematic analysis.	Four themes emerged: 1. Managing the nursing work. 2. Clinical decision - making. 3. Respiratory monitoring. 4. Equipment management issues.
Ludikhuize et al (2012) Netherlands	Describe how nurses and doctors judge the quality of care while caring for deteriorating patients on medical wards, compared	49 RNs. 68 Drs. Convenience sample.	Cross -sectional study using interviews of care providers compared with retrospective judgements of an	Statistical analysis Friedman test. Wilcoxon signed ranked test used for differences	Communication, cooperation, and coordination were graded positively. Medical staff graded these factors higher than the nursing staff. Independent experts

	with the judgement of independent experts.		independent panel of experts.		were more critical of the care provided by both medical and nursing staff.
Massey et al (2014) Australia	Explore nurses' experiences and understanding of the use of MET and its activation.	15 RNs based on three medical wards within one hospital.	Interpretive descriptive study.	Thematic analysis.	Four themes identified: 1. Sensing clinical deterioration. 2. Resisting and hesitating. 3. Pushing the button. 4. Leadership and support.
Author Year Country	**Aim**	**Sample**	**Research Design**	**Analysis**	**Findings**
Mc Donnell et al (2013) UK	Evaluate the impact of a new T&T and observation chart on knowledge and confidence of nurses to recognize and respond to patient deterioration.	15 RNs interviewed. Surveyed 212 6 weeks before and after study. Intervention included training of the new EWS and chart system.	A single Centre mixed methods before and after study.	Descriptive statistics. Interview data thematic analysis.	Following the intervention, the numbers of staff concerns were significantly reduced. The knowledge and confidence of the staff significantly improved following the intervention. Three themes emerged: 1. Staff concerns. 2. Staff knowledge. 3. Confidence and differences between RNs.
Minick and Harvey (2003) USA	Describe the early recognition skills of medical and surgical nurses.	14 RNs in one US hospital.	Hermeneutic phenomenology. Focus groups design.	Thematic analysis.	Three themes emerged: 1. Knowing the patient directly. 2. Knowing the patient through the family. 3. Knowing something is not as expected.
Mitchell et al (2010) Australia	To determine whether the introduction of multifaceted intervention to detect clinical deterioration in patients would decrease the rate of predefined adverse outcomes.	177 RNs, 28 Drs. Four study wards mixed medical and surgical wards in two hospitals. Intervention included a newly designed ward observation chart.	Prospective controlled before and after intervention study.	Descriptive statistics. Chi Square &l logistic regression and log rank test.	Decrease in unexpected admissions to ICU. Significant increase in numbers of patients receiving one or more MET reviews. Decrease in unexpected deaths. Increase in LOS. Increase in vital sign documentation.
Pantazopoulos et al (2012) Greece.	Evaluate the relationship between nurse demographics and	94 RNs. Survey design questionnaire distributed.	Descriptive quantitative survey.	Descriptive statistics. Mann-Whitney to compare	Nurses with 4 yr. degree identified clinical deterioration more accurately.

	correct identification of clinical situations that warrant MET activation.			knowledge scores between the two groups.	Nurses educated with resuscitative techniques responded to deterioration correctly. Vital signs monitoring was noted as important contributing factor to recognize and respond to patient deterioration. Respiratory rates and GCS were the least assessed vital signs.
Rattray et al (2011) UK (Scotland)	To determine which professional, situational and patient characteristics predict nurses' judgements of patient acuity and the likelihood of needing a referral.	99 RNs working within acute ward setting.	Factorial survey design. Paper based vignettes with sample survey procedures.	Multiple regression analysis and Analysis of variance (ANOVA).	Nurses use appropriate physiological parameters to base their clinical decisions in relation to patient acuity and need for referral. Education and development should focus more on the experiential learning rather than just knowledge itself.
Smith & Aitken (2016) UK	To investigate use of single parameter T&T chart to inform EWS tool.	105 questionnaires were distributed to RNs, Health care Assistants and student nurses, plus 74 patients' vital sign recordings were used as the data collection tool. 263 physiological triggers were included within the analysis.	Mixed method service evaluation. Questionnaires.	Content analysis and descriptive statistics were used.	Identification of several barriers and facilitators to monitoring and escalation of abnormalities. Highlighted the complexity of this process and the need for a system wide approach to patient deterioration.
Smith et al (2021) UK	Explore barriers and enablers of recognition and response to signs of patient deterioration by nursing staff.	33 RNs. A theory driven interview study underpinned by the Theoretical Domains framework of behavior change.	Descriptive qualitative study. Semi- Structured interviews.	Content analysis.	1. Barriers and enablers are most likely to impact on nursing staff afferent limb. 2. Behaviors were identified in nine domains of the Theoretical Domains Framework.

Minyaev et al (2021) Australia	To explore experienced ward-based Registered Nurses' views on the potential use of standing orders, prior to the escalation protocol, for patient deterioration.	Ten ward based medical and surgical nurses.	Hermeneutic Phenomenology. Semi-structured interviews.	Thematic analysis.	: Four main themes emerged: (1) Ambiguity in perception: the escalation protocol. (2) Observations within acceptable parameters, but the patient is deteriorating. (3) Paradoxes of escalation: well, laid out protocol, but hard to escalate. (4) We could intervene with standing orders, but are we permitted?
Wheatley (2006) UK	To determine the practice of recording basic observations of level 1 general ward patients.	4 RNs and 4 healthcare assistants with more than 2 years' experience.	Ethnographical study. Semi-structured interviews and direct observation.	Thematic analysis.	The experience of staff is important in the assessment of patients to detect deterioration. The role of taking the observations has been devolved from the RNs duty to the healthcare assistant. There appears to be a reliance on the use of electronic monitoring equipment.

2.2.6 Data analysis

In keeping with the interpretive description methodology used within this study, an integrative process was employed, whereby the data generated from the articles were grouped into two domains: **Recognising (Domain 1)** and **Responding (Domain 2)** to deterioration. A thematic analysis was used to identify the constructed themes using a systematic approach offered by Braun and Clarke (2006, see Table 17, p. 124), which involved reading and then rereading and comparing the study findings. Similar themes were then grouped and subsequently coded inductively. Table 6 shows an example of the coding process. The codes were listed to simplify the process of comparison between each theme to identify commonalities and differences in ward nurses' recognition and response to patient deterioration (see Table 7, p41).

Abstract of text within the article	Code developed
"There was recognition by nurses that there was a change in the patient's condition. A gut feeling and sixth sense were one-way nurses described how they recognised patient deterioration" Cioffi (2000).	→ Intuition
"All participants relied heavily on vital signs when assessing for deterioration" Endacott et al., (2007).	→ Assessing the patient → Vital sign monitoring
"Nurses noticed subtle changes in an individual patient over a period of time" Minick and Harvey (2003).	→ Knowing the patient
"Outreach services were valued and missed when not available. Both positive and negative experiences were described which indicated the variable clinical support available" Cox et al., (2006).	→ Accessing support

Table 6: Example of the coding process adapted from Braun and Clarke (2006)

The two key domains, recognition, and response were then divided to create a list of subthemes under each domain. In doing so, this gave clarity and focus to the constructed themes (Miles and Huberman, 1994).

Recognition (Domain 1)	Response (Domain 2)
Assessing the patient.	Accessing support.
Intuition.	Negative emotional response.
Knowing the patient.	Organisational infrastructure.
Vital sign monitoring.	Decision-making skills.
EWS system.	Relationship between doctors and nurses.
Communication.	Education and training.

Table 7: Identified domains with related themes from the literature

2.3 Presentation of results: recognition domain (1)

2.3.1 Assessing the patient.

Assessing the patient has been identified as a significant theme in recognising patient deterioration. Effective observation of ward patients is the first step in this recognition process. The subtle changes signalling deterioration require recognition of these events at an early stage and for corrective action to be taken, either independently or in consultation with medical staff. Ward nurses are ideally placed to recognise and respond to patient deterioration; however, they must be able to effectively assess the patient and escalate their concerns (Hart et al., 2014; Smith and Aitken, 2016; Azimirad et al.,2020). This action could prevent further health decline of the patient and increase the chances of an improved outcome. Some studies selected for this review identified that the assessment of patient acuity was crucial in determining clinical deterioration in a timely fashion (Pantazopoulos et al., 2012; Chua et al., 2013; Massey et al., 2014; Dresser et al., 2023).

In Pantazopulos et al., (2012), 94 nurses were examined through a descriptive quantitative survey. They demonstrated that vital sign measurement was an integral part of the assessment process, and nurses with further training in resuscitative techniques responded more appropriately to those who had not completed this training. Moreover, Chua et al., (2013) explored the experiences of 15 nurses when dealing with the deteriorating patient and identified them needing to modify their educational developments: indeed, the nurses had difficulty in recognising these subtle

changes and felt less confident in responding to this challenge. Although nurses are central in the detection of health deterioration in patients, deterioration has been reported as being difficult to detect (Andrews and Waterman, 2005; Cioffi, 2000; Smith et al., 2021).

Deteriorating ward patients are recognised by nurses through three processes:

- Intuition: knowing that something is not right by the process of knowing the patient and recognising changes in behaviour or physical signs and pattern recognition, where nurses recognise deviations from the normal clinical course (Cioffi, 2000; Minick and Harvey, 2003).
- Patient and/or relative(s) raising concerns (Cioffi, 2000; Cox et al., 2006).
- Vital sign measurement (Andrews and Waterman, 2005).

2.3.2 Intuition

The study of intuition in clinical nursing has increased over the past 30 years. The origins of intuition were initially identified by Carper (1978), who was influenced by the earlier works of Dewey (1958) and Polanyi (1962). More recently, intuition has been considered as a type of legitimate knowledge in nursing, plus a way of learning (Smith and Glazer, 2008). The achievement of nursing knowledge is generated through empirical, aesthetic, personal, and ethical knowing, according to Carper (1978). This is expressed by some authors as the "art of nursing" or aesthetic knowledge, while others believe intuition is attributable to "personal knowledge" (Sweeney, 1994).

Intuition has been identified as the most common process of recognition of deterioration, owing to nurses knowing the patient and being able to pick up subtle changes in their behaviour or physical state, or through pattern recognition (Dreyfus and Dreyfus, 1986). This "gut instinct" or feeling is often associated with the inability to explain what it is that is different and is expressed within the literature as something you "cannot put your finger on" (Benner, 1984). Repeated exposure to similar situations with specific conditions enables the nurse to recognise deviations from normal patterns (Cioffi, 2000; Minick and Harvey, 2003; Cox et al., 2006; Azimirad et al.,2020). Dresser et al., (2023), described medical and surgical nurses' perceptions of factors that influence their clinical judgement when caring for the deteriorating patient. Twenty RNs were recruited onto this qualitative descriptive study. They discovered that experience was

the element that matters. This experience provided their participants with an intuitive or a "gut feeling" that prompted them to have a closer look. They elaborate on this point highlighting that changes in vital signs occur late in deterioration and suggest subjective and objective indicators need to be actioned once recognised. The developed theme "experience matters" relied upon the wealth of literature to describe nursing intuition (Benner, 1984; Benner and Tanner, 1987), and suggested that there is a need to understand the use of intuition in clinical judgement in more detail.

While reviewing these studies, I observed that the concept of intuition was not pre-defined by the researchers to capture the essence of what intuition is, what it means to the individual nurse or, more importantly, how intuition was measured within the reviewed studies. Therefore, this gave rise to speculation as to how the nurses are interpreting intuition. There appears to be an assumption that the nurses' perception of intuition is consistent with the other participants within the same studies; the clarity of this crucial point is absent from the research articles. The authors, therefore, can only rely upon the descriptions of the participants' action in relation to their declared use of intuition, rather than claim that intuition is an influencing factor of nurses' recognition and response to patient deterioration pertaining to this literature review.

In Cioffi's (2000) study, the design was a qualitative descriptive study, with a sample population of 32 experienced female Registered Nurses (RN). There was no indication from the author as to why the participants were all female; therefore, gender-related issues were not considered in light of the study's outcome. The study setting was a mixture of seven medical and surgical wards in a large Australian hospital. Although the nurses clearly stated that they had realised intuition was their preferred method of choice to recognise patient deterioration, there was no elaboration of this within the study. It was not clear if they were using intuition as part of their initial patient assessment or in combination with vital sign data. The average number of years of experience as a RN was 14. The decision-making process relied upon and was linked to the recall of experiences similar to the present. Therefore, patterns were built up from exposure to many patients of similar types, condition, or procedure, or a heightened familiarity with the patients' medical history (Minick and Harvey, 2003; Chua et al., 2013; Massey et al., 2014; Chau et al., 2022).

A similar situation as the previous was noted in a study by Minick and Harvey (2003). Their chosen methodology was a hermeneutic phenomenological design using focus

group interviews, with a sample size of 14 RNs in the USA. Once more, it was noted that there was no pre–defined definition of intuition utilised; the nurses reported their use of intuition as the early part of their assessment of the deteriorating patient. The difficulty facing the reader is the clarity of their individual interpretation of intuition, as this is not accounted for within the study. The equivalent is seen in the study by Cox et al., (2006), which explored the experiences of seven RNs within a qualitative descriptive study conducted within the UK. A purposeful sampling method was employed. The sample size was small in comparison with other studies, although this is consistent to qualitative research involving the depth needed to generate the research findings (Barroso et al., 2003). This study confines itself to one medical ward, increasing the limitations of the study and the findings. The nurses reported that while they had taken vital sign recordings, this verified what they had intuitively suspected. The findings were brief, with no further detail of what those intuitive suspicions were, but merely documented that this process had occurred.

A later study conducted by Andrew and Waterman (2005) explored a mixed sample of 44 participants 30 RNs, 7 doctors, and 7 Healthcare Assistants (HCAs). This was a grounded theory approach. This study highlighted the difficulties faced by nurses if no quantifiable evidence was provided as measurable information in which to form a diagnosis and instigate interventions. In this incidence, the notion of intuition was suggested to be a hindrance, as the nurses had no objective evidence to warrant a medical review and found it difficult to convey their meaning of deterioration. It was also acknowledged that there was a reliance on vital sign information that formed the basis to succinctly convince medical staff to act. This was connected to a dependence on the equipment and the notion of the routine task being undertaken, often referred to in clinical practice as "doing the obs" and allocated to the most junior staff on the ward (Gazarian et al., 2010). The recognition of physiological abnormalities is, primarily, the responsibility of the nurse. Cox et al., (2006) and Endacott et al., (2007) alluded to the impact of education and experience in how nurses effectively assess the physical state of the patient, potentially leading to missed cues in detecting deterioration, and consequently suggesting a comprehensive approach to this assessment process.

The study of Endacott et al., (2007) was a mixed-method case study design. The sample population consisted of 11 RNs, 14 Doctors, and a chart audit of 17. It would seem nurses relied heavily on vital signs when assessing for deterioration. Whilst in possession of this

information, the vital signs recordings acted as verification of what the nurses had intuitively suspected, as previously mentioned in other studies. The difference seen in this study is the nurses' reliance upon their visual assessment of the patient and purposefully looking for patient activity cues, such as distress. By contrast, doctors sought additional evidence in terms of vital sign data to suggest objective measurement to account for the deterioration. Nurses frequently reported in various studies that changes in patients' vital signs were quantifiable indicators of deterioration and were therefore used to successfully package deterioration to medical staff to escalate care (Minick and Harvey, 2003; Gazarian et al., 2010, Burke and Conway, 2022).

There appears to be repetition in the findings from the studies reviewed, in terms of nurses' description of their individual perception of what they believe intuition to be, rather than exploring this notion of intuition in more depth. Therefore, it appears accepted by the authors that nurses utilise intuition. The question for me as the reader is: are these nurses applying their intuitive knowledge, experience, and expertise to the situation, or are they simply using the terminology of 'intuition' as their discourse to describe their inability to act, due to a lack of understanding?

2.3.3 Knowing the patient.

The nurse/patient relationship is fundamental to basic nursing care although, at times, it can be elusive; the characteristics of this relationship contribute to positive patient outcomes. Knowing the patient was identified as a recurring theme in nurses' discourse about their practice (Cioffi, 2000). This has been characterised by in-depth knowledge of the patient's patterns of responses and knowing the patient as a person (Cioffi, 2000; Donohue and Endacott, 2010; Dresser et al., 2023).

Donohue and Endacott's (2010) study examined the processes of how 11 RNs managed patient deterioration using a qualitative methodology. A thematic analysis conveyed the findings, discovering the importance of the initial patient assessment in recognising patient deterioration using the Early Warning Score (EWS) to escalate concerns. Clinical judgment occurred through knowing the patient, as nurses believed this influenced patient outcomes. Knowing the patient directly was also a prominent theme, as nurses could describe subtle changes within the patient's status, which has also been indicated in other studies (Minick and Harvey, 2006; Cox et al., 2006; Massey et al., 2014; Dresser et al.,2023). However, typically, these very slight changes were not

pronounced enough to be labelled as a recognised sign of deterioration, such as low blood pressure and elevated temperature, yet a change was apparent to the nurses (Cioffi, 2000; Minick and Harvey, 2006; Wheatley, 2006).

Dresser et al., (2023) stated, knowing the patient was a dominant theme describing activities that the participants had used to detect subtle changes in the patient's behaviour, emotional or physical condition. Preforming a patient assessment was instrumental to knowing the patient and this was echoed by the multiple participants. These subtle changes were noted before the participants measured the patient vital signs, highlighting the importance of observation as a part of the assessment and as an early warning strategy.

Nurses frequently reported changes in patient behaviour. For example, not being as talkative, looking very drowsy, not eating a great deal, or undergoing a change in their mood. There is minimal discussion within the literature to account for these subjective cues in relation to their significance in recognising deterioration (Endacott and Wesley, 2006; Cioffi, 2000). For example, using a qualitative case study approach, Endacott, and Wesley (2006) examined the strategies used by 20 RNs to manage patients at risk of deterioration. They highlighted the recognition of patient deterioration through knowing the patient. The participants identified patients who were less talkative as one of the variables used to describe this process. This, regrettably, was ambiguous, as there were no defined criteria to explain what this meant in terms of the patient becoming "less talkative," as this may be due to the patient having a quiet day, which could equally account for their reduction in communication. However, if this observation of not being as talkative is coupled with a reduction in the patient's mental capacity or level of consciousness, this would be an indication of health deterioration – this point was not clarified within this study (Cardona-Morrell et al., 2016).

In contrast to this, a study conducted by Gazarian et al., (2010) explored the experiences and views of 13 female RNs based on four medical wards in a USA hospital. The methodology used was a qualitative descriptive approach. They described several cues identified by nurses that influence the decision-making process, in terms of their recognition and response to acute deterioration. This included knowing the patient, vital sign monitoring, clinical skills, communication, experience, access to knowledge resources, and senior support. They elaborated on the clinical skills developed through experience and knowledge, which equips nurses to recognise and deliver proactive

interventions to prevent further decline in deterioration. This study offers some clarity of cue development and identifies the wide range of influencing factors discussed within other studies.

In Cioffi's study, the nurses recognised a change in the patient's condition. The findings offered a short description of the cues, such as "a patient you know really well suddenly does silly things like pulling at the catheter or pressing the call bell half a dozen times." The nurse explained, "This is not normal. There must be something wrong" (cited in Cioffi, 2000, p. 111). The explanation of why this nurse associated this cue with patient deterioration were not explored within the study but acknowledged as an important cue of deterioration. Whilst there is an understanding of the significance of the cue mentioned, more discussion is needed to contextualise its meaning and define the role in terms of patient deterioration as, potentially, there could be early stages of deterioration, but this could equally be lost in their translation (Cooper et al., 2011; Ludikhuize et al., 2012; Douw et al., 2016).

Minick and Harvey (2003) suggested that the ability to detect these subtle cues by the nurses was due to previous contact with the same patient over a period. This is acknowledged in more recent studies, confirming the importance of knowing the patient (Cooper et al., 2013; Smith and Aitken, 2016; Cardona-Morrell et al., 2016). The difficulty for the nurses was how to package this subtle change in the patient once this had been recognised to the medical staff. This sudden change may not be reflected within the vital signs, resulting in no breach of the EWS threshold. Therefore, making this situation difficult to articulate the perceived change of health status to escalate the patient's care. This was a prominent theme within some of the studies reviewed, which tends to share an association with intuition (Cox et al., 2006; Ludikhuize et al., 2012; Massey et al., 2014). Burke and Conway, (2022) conducted a systematic review of the literature examining factors influencing nurses' escalation response to patients EWS. They suggested that the EWS scoring was described to give the nurses a sense of empowerment, not only to support their decision making, but this also offered them legal protection within the governance framework of the EWS protocol. This relates to the NHS litigation insurance offered to all members of staff via vicarious liability. Conversely, this protection would only apply in law if the staff member has executed their duties in accordance with the policies and procedures of the NHS Trust protocols. Interestingly, within this review this was only mentioned by six, out of the eighteen studies

of their review, this issue was highlighted within my own study emphasising the complexity of this area of inquiry.

Douw et al., (2016) developed a clinical assessment tool previously based upon determined worry signs, as documented from nurses within their previous work. This included a literature search, resulting in 18 studies selected, with a total score of 37 signs and symptoms reflecting the nature of the worry criterion that emerged from the data, and was later summarised as the indicators listed below. The tool was named the Dutch-Early-Nurse-Worry-Indicator-Score (DENWIS). In addition to utilising the vital sign information, nurses' "worry" became an intrinsic part of the calling criterion to activate the Rapid Response System (RRS). The RRS system is briefly discussed later in this chapter. This study team explored the "worry" criterion within the literature and found numerous underlying signs that nurses' act upon, which were categorised into 10 indicators. Intuitive knowing was one such indicator. The remaining included: changes in respiratory pattern, changes in circulation, rigours, changes in mental state, agitation, pain, no clinical progress, patient indicating they are not feeling well and, finally, subjective nurse observations.

In conclusion, they discovered that the DENWIS system encouraged early recognition, as both the EWS plus and the DENWIS score combined elevated the score to that above the activation threshold, therefore improving the nurses' confidence when activating the RRS, and thus facilitating earlier recognition through knowing the patient. This is the only study to date that has identified the need for a combined calling criterion to capture the holistic approach used to assess patient deterioration. This is achieved by reforming those subjective cues through knowing the patient as mentioned, to become an integral part of the combined EWS scoring criteria.

2.3.4 Vital sign measurement

The recording of vital signs is the most common method of documenting the patient's overall well-being or deterioration. Internationally, hospitals mandate these measures to be taken at varying intervals during the day (Cardona-Morrell et al., 2016). The policies are also inclusive of any deviational change from the norm: the care is to be escalated for a medical review if the threshold is triggered. The recording of vital signs was reported as an important characteristic in assessing the patient and appeared to be divided into two distinct categories: routine and standalone observations (Cox et al., 2006; Hogan, 2006; Cardona-Morrell et al., 2016).

The practice of recording vital signs is performed either by a trained nurse or healthcare assistant (HCA) going to the patient's bedside with the equipment needed to collect this clinical information, which is based on the patient's physiological data, such as blood pressure and pulse. The routine recording of vital signs has been reported as being a ritualistic practice and, as a result, highlighted to be incomplete, infrequent, and recorded with the lack of knowledge required to interpret the physiological data, often performed by the HCA (Rattray et al., 2011; Mitchell et al., 2010).

Rattray et al., (2011) examined 99 RNs through a series of paper-based vignettes and carried out a factorial survey. They concluded that the nurses used the physiological parameters to inform their decision-making regarding patient acuity and supported the use of EWS. Furthermore, they commented that developments should focus on experience and clinical expertise, rather than just knowledge acquisition alone. There is a distinct lack of clarity in the literature on who should perform this task, although it was reported that it becomes the responsibility of the nurse to take the required action if patients deteriorate (Weatley, 2006; Hogan, 2006; Cox et al., 2006; Burke and Conway, 2022; Chu et al., 2022). Evidence shows that the nurse can gain more information about patients by talking, touching, feeling, assessing, and monitoring them in ways that are not permitted by technology or HCAs (McDonnell et al, 2013; Hart et al., 2014; Smith and Aitken, 2016). This ambiguity is accounted for within the literature in terms of the distribution of workload within the ward; trained nurses felt they did not need to complete the vital signs if the HCA would inform them of any deviational changes (Cooper et al., 2011; Ludikhuize et al., 2012).

Chau et al., (2022) study, recruited 12 Enrolled Nurses (ENs) and 11 RNs to explore the collaboration between both these professionals when caring for the deteriorating patient. The results highlight an interesting power shift balance between Enrolled and Registered nurses, due to several factors. The main factors indicated were lack of empowerment among ENs to use the EWS tool to escalate the patients care direct to the medical staff. Other themes highlighted were, the lack of recognition of the ENs capability and competency, plus the lack of acknowledgement of the ENs patient assessment by the RNs. This is an interesting illustration of role power disparity and its influences within this area of inquiry. This was attributed to differences in educational background, and professional status within the organisation. Which impinges on the debate of who's role is it, to escalate the patients care. The recognition and response

time is surely more important to instigate plans to prevent further deterioration, rather than who is making the decision to escalate the patients care.

The equipment used was viewed as equally important in the role of nurses' initial assessment of the patients' vital signs. However, there are issues reported, ranging from limited access of equipment to broken and often missing accessories (Mitchell et al., 2010). The use of this equipment was highlighted as a time-limiting factor of the actual assessment, as the nurses or HCA would spend little time completing this task before moving onto the next patient. This would be dependent on the time it takes for the blood pressure cuff to inflate and deliver the desired measurement (Wheatley, 2006; Hogan, 2006). In contrast to this, other studies reported that the use of equipment influenced nurses' ability to recognise patient deterioration in a timely manner (Cox et al., 2006; Gazarian et al., 2010). Having said this, Cox et al. reported that nurses were too reliant on the equipment, which was something they perceived to have a detrimental effect on the holistic approach. Equally, the unfamiliarity with the equipment hindered the nurses in the recognition of deterioration; plus, it has been noted that this practice is open to scrutiny due to wide variation in the differences of knowledge and experience of the staff performing this task (Cox et al., 2006; Gazarian et al., 2010; Cardonna–Morrell et al., 2016).

Changes were implemented worldwide within clinical practice in the early part of the 1990s, in part due to the work of McQuillan (1998), which was supported by other authors (Ludikhuize et al., 2012; Cooper et al., 2013; Massey et al., 2014). To address the prevailing issues relating to the lack of recognition and response to patient deterioration, two main components were brought together to assist with this process. The first was the introduction of an Early Warning Score system (EWS). The second was a communication tool referred to as Situation Background Assessment and Response (SBAR). Their aim is to deliver prompt and succinct information to the responding healthcare professional. The following paragraphs briefly describe these systems.

2.3.5 Early Warning Score (EWS)

The EWS system is a calling criterion based on physiological vital signs that was introduced with the aim of creating a warning score to secure timely intervention once raised and to identify patient deterioration, which could be construed as a double edge sword for nurses Burke and Conway, (2022). Lee developed the first Early Warning Scoring (EWS) system et al., (1995) in Australia. Since then, many more have been developed internationally (Lee et al., 1995; NICE, 2007). These systems are referred to as 'Track and Trigger' (T&T) and Early Warning Systems (EWS). They have been endorsed by a variety of professional bodies and agencies relating to the safe delivery of acute patient care. For example, they are recommended within the UK by the Royal College of Physicians (RCP) (2012), Department of Health (DOH, 2003), and NICE (2007). In the USA, they are recommended by the Institute for Health Improvement (IHI, 2006), plus in Australia the Australian Institute of Health and Welfare (AIHW, 2008). Further to this, they are recommended within other parts of Europe.

Whilst the tools used can vary, they adhere to a similar format, in the sense that they offer the nurse a points system to create an alert once physiological parameters have deviated beyond a normal range. Their purpose is to act as adjunct to clinical decision-making, to enhance early recognition of deterioration. Each of the scores are weighed against preselected score thresholds, and deviational changes from the predetermined range generate a cumulative score (Gao et al., 2007; RCP, 2012; McDonnell et al., 2013). Currently, there are four types of T&Ts in place internationally (see Table 7). Within the UK, many of the NHS Trusts use the aggregate scoring system for individual physiological variables.

System	Trigger
Single parameter	One or more vital sign variables, such as blood pressure, pulse, respiration.
Multiple parameter system	Two or more vital sign variables
Aggregate scoring system	Achieving a previously agreed trigger threshold with the total score
Combination system	Single or multiple parameter systems used in combination with the aggregate scoring system.

Table 8: Types of track and trigger systems (DOH, 2003; NICE, 2007)

The literature indicates that most of the nurses welcomed the idea of this tool, as it gave them authority which, in turn, boosted their confidence and aided their own patient assessment. The system assisted the nurses to frame their intuitive thought process of having a "gut" feeling that something was wrong, and felt the system legitimised their assessment (Wheatley, 2006; Chau et al., 2013;2022).

Donohue and Endacott's (2010) study examined the nurses' confidence in requesting a patient review, which improved when they used the EWS system. This gave the nurses an objective score and, once the scoring threshold was triggered, the nurses reverted to the policy guidelines, which gave them a sense of empowerment of having the ability to request a medical review. Although the nurses were given this legitimate authority, the medical staff (Cioffi, 2000) did not lightly take this.

A small number of nurses felt confident in calling for assistance from the medical team, while others felt nervous and remained uncertain, worried they would look 'stupid' in front of their medical colleagues. Some of the nurses reported waiting to see if the patient's condition worsened, even though the EWS score triggered the threshold, before calling for help. It was also observed that nurses had difficulty in escalating the patient care if the EWS trigger had not breached. This was related to their justification and claimed use of intuitive, experiencing problems to articulate their gut feelings, in which they found challenging (Andrews and Waterman, 2005; Hogan, 2006; Smith and Aitken, 2016; Burke and Conway, 2022).

Burke and Conway, (2022), described the EWS system as either a blessing or a curse, which featured as a constructed theme within my own study illustrating similarities. The raised EWS score enhanced a sense of empowerment and enablement to package patient deterioration to the medical staff. However, if the EWS presented with a lower score, the tool was flawed in its use due to its narrow focus, and sensitivity which became particularly problematic as highlighted within my study.

A high value was placed on experience, both in recognising and responding to deterioration; the quantitative data taken from EWS should not be viewed in isolation, as authors believe the qualitative data also play a crucial role in the clinical decision-making process. Familiarity with the patient, specialty, and the use of clinical judgement were also important factors (Cioffi, 2000; Wheatley, 2006; McDonnell et al., 2013; Smith and Aitken, 2016). Similarities were beginning to emerge, suggesting the overreliance on the EWS system with a lack of awareness of its limitations. This produced some concerns by authors that EWS would be perceived as the panacea in addressing the issue of sub-optimal care of the deteriorating patient (Minick and Harvey, 2003; Andrews and Waterman, 2005; Cooper et al., 201; Chau et al., 2022).

In contrast to this, a study by Cardona-Morrell et al., (2016) observed 44 nurses completing vital sign assessments using (EWS). The study concluded that although the assessments were well documented in many cases, the full ranges of measures were rarely obtained. As the authors explained, despite a triggered response, some nurses were still missing the cues to escalate the patient's care, and that the recording of vital signs remained incomplete (Ludikhuize et al., 2012; Smith and Aitken, 2016). This point was particularly prevalent in a study by Ludikhuize et al., (2012) that used a convenience sample of 49 RNs, 36 doctors, and 32 specialist doctors within a cross–sectional study. This study clearly demonstrates the lack of documentation of vital signs of those patients in the hours preceding a life-threatening adverse event in hospitalised patients. This study also reported that this might hamper the recognition process; despite the incomplete measurement, 81% of their patients were identified as deteriorating using the EWS.

Smith and Aitken (2016) conducted a mixed–method service evaluation prior to the implementation of EWS, examining a mixture of physiological triggers and characteristics of 74 patients. This involved distributing a questionnaire to a sample of 105, including RNs, HCAs, and student nurses. Unfortunately, no indication was given as

to the representation of those staff groups within the sample population. Considering the above, the study outcomes were difficult to interpret. The data highlight a significant inaccuracy in the recordings of vital signs following a trigger. They further concluded that the selection of the vital sign measured was dependent on the person's clinical judgement completing this task or time availability rather than mandated policy. There was no indication within the study findings for the reasoning behind the selection of certain vital signs. The concern stressed by Smith and Aitken (2016) is that this practice is self-limiting the recognition process due to incomplete assessment. It seems recommendations to improve this practice were taken forward.

A study completed by Azimirad et al.,(2020) examined nurses' attitudes towards the RRS competence. Three hundred and eighty-eight RNs participated within the study from a mixture of medical and surgical wards within the UK and Finland. More than half of the sample perceived the physician's influence as a barrier to escalation. Interestingly the Finnish nurses were more likely to activate the RRS and were reported to rely upon their intuition more so than the UK nurses. This is owing to the Finnish nurses having a nurse worry indicator score factored into the matrix of their escalation process which would account for the raise in the EWS systems. The trigger scores from the EWS plus the Dutch Early Nurse-Worry-Indicator- Score (DENWIS) is combined, hence the raise in EWS. The nurse worry indicator score is an interesting concept developed by Douw et al., (2016) as mentioned within this review. Which raises a question in relation to the UK EWS model of whether this system has an in-built blind spot? However, by combining the DENWIS and EWS scores together the raised trigger threshold would activate the RRS though the policy driven criteria, in turn creating more opportunities for deteriorating patients to be medically reviewed. In this sense, the escalation process would become more streamlined, enhancing the ward nurse's confidence in the use of the EWS system and, enabling activation of the RRS promoting early recognition of patient deterioration.

2.3.6 Intelligent Assessment Technologies (IAT)

The use of handheld computerised EWS systems were introduced in part due to the continuing reports of failure to detect deterioration and missed opportunities to reverse, halt, or prevent conditional changes in ward patients (Preston and Flynn, 2010). These devices require the nursing staff to enter the vital sign measurements. This replaces the paper chart, ensuring completion before automatically calculating a score, and offering decision support to the nurse. The application of this system within the UK affords the advantage of being centrally linked into a Trust's intranet, meaning that access to

this data is possible throughout the Trust (Jones et al., 2011c). The information is displayed electronically in a central console based at the nurses' station and highlights the overall EWS score for each individual patient on the ward. The system provides completeness, accuracy, and legibility, thus reducing the ambiguity of vital sign data (Prytherch et al., 2013). It also generates alerts when the vital signs present with high scores, actively manages the time intervals of the vital signs, and enables tracking of the clinical response, as well as offering central data storage for audit and governance purposes. Intelligent Assessment Technologies (IAT) are becoming more widespread and act as safety nets within NHS Trusts. Furthermore, as of 2015, a third of Trusts converted from paper based EWS to IATs (Hogan et al., 2019).

2.3.7 Communication

There is evidence within the literature that the negative attitudes in calling for help caused delays and non-compliance with the calling criteria (Cioffi, 2000). As mentioned, when using the EWS system, nurses were reported to have feelings of anxiety, mostly feeling nervous and uncertain of how to use the calling criteria. This, combined with their feelings of panic, anxiety, excitement, and, in some cases, lack of confidence, contributed to their uncertainty of what would be expected of them when they attempted to escalate the patient's care to a higher level (Cioffi, 2000; Hogan, 2006; McDonnell et al., 2013; Fazzini et al., 2023).

The importance of having the confidence to communicate the identified problems was a recurring theme. Confidence was measured not just as the nurses' own ability to act when it came to recognition and response, but also their colleagues' ability. This lack of confidence was identified in Chua et al., (2013) as being attributed to a lack of knowledge and common understanding and perception regarding the patient's deterioration, plus a failure to structure this communication of the patient's condition to command the attention of the responding healthcare professional. The study by Chua et al. recognised communication errors between staff members, which may have serious implications to the delivery of this care, which has also been reflected by other authors (Cioffi, 2000; Endacott et al., 2007; Smith et al., 2021; Fazzini et al., 2023). In contrast, Andrews and Waterman (2005) reported that packaging the vital signs using EWS improved communication between doctors and nurses, guiding them to deliver a more precise and unambiguous means of reporting deterioration. The problems surfaced when the score threshold had not been breached, placing the nurse in a

difficult situation to communicate their concerns to medical or more senior nursing staff, which they found difficult without objective measures.

Smith and Aitken (2016) reported that the escalation of a patient's deterioration using a communication tool was uncommon but relates to the importance of communication as the facilitator to escalation. Despite the importance of this, it was acknowledged that delays in recognition and response frequently occurred. Many of the returned questionnaires within this study referenced communication and the interaction between medical and nursing staff as a barrier or facilitator to effective patient monitoring. Furthermore, Endacott et al., (2007) reported the inadequacy of the infrastructure and processes to allow for good communication cues to be conveyed to a more senior clinician. The participants within this study identified this problem as being associated with the regular use of casual or part-time staff and multiple demands on medical time. Similarly, Burke and Conway, (2022) found the studies lacked depth of description in terms of inter-professional communication. As an example, some of the studies reported an ease of the escalation process using EWS when there is a mutual respect, trust, and support amongst medical and nursing staff, as highlighted within my own study, and equally, other studies suggest that tensions between the doctor and nurse can make escalation of care difficult(Azimirad et al ., 2020; Chau et al ., 2022).The latter was accounted for by describing diminished staffing levels, unrealistic workloads, increased patient acuity, and the above forming barriers in the escalation of care. The findings highlighted the lack of discussion about the use and merits of SBAR as a communication tool, which is surprising as it is used within the UK where most of the cited studies within their review originated.

In the context of a critical event, nurses and physicians invariably communicate over the phone, which makes communication errors more likely. In addition to this, a high percentage of serious adverse events have been reported to include communication as a contributing factor (Haig et al., 2006; Smith et al., 2021 Fazzini et al.,2023). In Fazzini et al.,(2023) study, they embarked on a service improvement project, ensuring a structured multidisciplinary team safety briefing. This improved the communication between the teams, improved situation awareness and reduced the delay in escalation of the deteriorating patient within the out of hour's period. A standardised communication tool has been proposed to assist nurses in effectively articulating their concerns to the medical staff in an emergency. The tool adopted for use is known as '**SBAR**': **S**ituation – the purpose of the call; **B**ackground – information relating to the

patient's condition, date of admission, diagnosis, and past medical history; **A**ssessment – requires the caller to provide a brief evaluation of the presenting clinical problem; and **R**ecommendation – affords the caller to offer a suggested treatment option. The SBAR tool (see Table 9) was originally designed and utilised by the US Naval Nuclear Submarine Service to simplify the urgent transfer of information (Kaiser Permanente of Colorado, 2009).

Question	Description	*Example*
S Situation What is going on with the patient. Why are you calling?	Firstly, the speaker presents the situation by identifying themselves, stating the patient's name and briefly describing the problem.	*"Dr Walsh, I'm calling about Mr. Helm, who has severe central chest pain."*
B Background What is the background or context of this patient?	The speaker then provides the background, such as the patient's diagnosis or reason for admission, medical status, and relevant history. The patient's chart is reviewed and questions that the other care provider may have been anticipated.	*"He's a 65-year-old man with Ischaemic heart disease who has been sliding downhill, and now he's acutely worse."*
A Assessment What is the problem?	After this, specific information on vital signs, recent laboratories, and other data related to the patient's current state are provided. This section can include a provisional diagnosis or clinical impression.	*"I think he may be having an acute coronary event."*
R Recommendation What is the next step in the management of the patient?	An informed suggestion for the continued care of the patient must be made by the speaker.	*"He is not looking very well, and he needs morphine for his pain and treatment. I need your help immediately; he is for full escalation of care"*

Table 9: SBAR tool (adapted from: Leonard et al., 2004; Dunsford, 2009)

Owing to the difficulties experienced, there is evidence to suggest that an adaptation of this SBAR tool is reported to be widely employed by numerous NHS Trusts within the UK, with 90% of Trusts reporting use by 2015. This corresponds with its adoption by other health care providers around the world, to facilitate a succinct method to communicate the recognition and response of patient deterioration. However, to date, evidence to evaluate this tool is sparse (De Meester et al., 2013; Hogan et al., 2019; Burke and Conway, 2022).

2.4 Recognition Domain (2)

2.4.1 Accessing support and negative emotional response

Seminal research in the early 1990s illustrated the implications of suboptimal care, which prompted calls to improve the care and management of the deteriorating patient internationally. One of the proposed solutions offered included the implementation of a Rapid Response System (RRS) (Lee et al., 1995; DOH, 2000; Berwick et al., 2006). The term 'rapid response system' is an umbrella phrase encompassing a plethora of systems derived from this concept, such as: Medical Emergency Team (MET), Rapid Response Team (RRT), Critical Care Outreach Team (CCOT), Acute Response Team (ART), and so on (Devita et al., 2006; Winters et al., 2013; Azimirad et al., 2020). These systems allow any member of staff to summon a team to enhance the early recognition of patient deterioration, providing they meet one or more of the activation calling criteria. The system activation is guided by the EWS in relation to deviational changes in the patient's vital signs. The RRS provides rapid access to personnel with critical care experience and diagnostic skills who can deliver timely intervention to the deteriorating ward patient (Berwick et al., 2006; Winters et al., 2011). Different approaches have been adopted internationally to effectively supply 'critical care without walls' to the deteriorating ward patient (Intensive Care Society, 2002, p 9).

Once the deteriorating health of the patient has been recognised by the ward nursing staff, the next step is to summon help. Accessing support is intricately linked with negative emotional responses within the literature reviewed; therefore, I decided to report both themes together to aid the readers' understanding of their combined significance. In a few of the studies reviewed, the nurses initiated simple interventions, such as position change of the patient and giving oxygen therapy and fluid resuscitation. This responsibility for the patient's safety was recognised by the nurses before activating the RRS (Donohue and Endacott, 2010; McDonnell et al., 2013; Cox et al., 2006). Accessing support from medical and nursing colleagues was highlighted as a crucial step forward in the escalation process in seven of the studies within this review. The nurses obtained advice from those with more experience, which was associated with a mutual respect and trust, which brought a sense of reassurance to those nurses less qualified in dealing with these situations (Cioffi, 2000; Andrews and Waterman, 2005; Cox et al., 2006; Donohue and Endacott, 2010; Gazarian et al., 2010; Massey et al., 2014; Douw et al., 2016; Smith et al.,2021).

Within the studies reviewed, nurses described how, at times, medical staff would either disregard or not respond to their concerns, which encouraged a negative emotional response. This issue was raised several times in the literature, although presented briefly as a short narrative. Nurses acknowledged this negativity as a communication obstacle as they attempted to escalate the patient's care, having a fear of being ridiculed and/or having damage done to their professional credibility due to poor communication with the doctor. Therefore, the ability to outline the patient's deterioration required good communication skills, confidence, and experience before they activated the response. This negativity was highlighted as a factor that created a barrier to accessing support. This uncertainty of the decision–making contributed to the nurses feeling nervous and having increased anxiety within the situation, coupled with the unfamiliarity of dealing with an emergency (Cioffi, 2000; Andrews and Waterman, 2005; Massey et al., 2014). As described in Cioffi's (2000) study, these feelings were associated with past experiences, creating the fear of "losing" the patient, reflecting to a time the emergency team was only called once the patient had experienced a cardio-pulmonary arrest. The prominence of this theme was shared in the study by Cox et al., (2006), as participants also related to what they described as "heightened emotions" due to their own uncertainty of their skills and knowledge in managing these patients. The nurses' perceived confidence was a key factor in how they would cope and view this experience.

Confidence emerged as a theme within seven of the studies, albeit in a very subtle way, potentially allowing this theme to become overlooked in the ocean of information generated (Cioffi, 2000; Andrews and Waterman, 2005; Cox et al., 2006; Donohue and Endacott, 2010; Chua et al., 2013; Cooper et al., 2013; Massey et al., 2014). Its superficial presentation in the findings may suggest this theme is underestimated as an important factor in terms of its overall contribution to this clinical situation. It would appear the research findings are attempting to build up a bank of generic issues relating to factors that influence the recognition and response process. In doing so, the dilution of some themes becomes more apparent, as the reader is directed to the repetition of the prevailing issues. The strengths and weaknesses of this theme are undervalued, as is the importance of its potential to breakthrough some of the barriers, such as: recognition of deterioration, communication strategies, applied knowledge and intervention, and the activation of the RRS in a timely manner. Future research is clearly required to develop this theory in more detail.

In Smith et al., (2021) study, 33 RNs were recruited into this descriptive qualitative study, part of their analysis demonstrated the difficulties faced by their participants in escalating the patients care. Some of the RNs believed their nursing peers were supportive and encouraging to monitor the patients' vital signs and then escalate the care when appropriate. This was particularly influential when the colleague was perceived to be more experienced / senior in role. However, others reported the opposite; they believed their nursing colleagues could at times, be discouraging and dismissive. This study offered some new insights into the barriers and enablers relating to a number of factors, one being social interactions with peers and colleagues as this is played out in a form of nursing role power, similar to that described by Chau et al., (2022). These nurses are lacking self-confidence to activate an RRS call, or package to the medical staff directly, this is an interesting finding as the literature to date has primarily concerned itself with problematic relations between the medical and nursing teams, this is an avenue in need of further exploration as this has never been identified within the "failure to rescue" literature.

In Andrews and Waterman's (2005) study, questions were raised in relation to the medical terminology used to convey information to the medical staff. As already observed, doctors require objective evidence of deterioration, which assists them to prioritise their workload between the wards. The nurses' inability to use medical language with confidence or to describe their concerns became known within this study. The researchers concluded it is the experienced and confident nurses who are more likely to use medical language, however, they still fear ridicule if they use this language out of context. Andrews and Waterman further commented that nurses are, in fact, undermining their own skills and knowledge, as the use of medical language is perceived to be linked to credibility. In Donohue and Endacott's (2010) study, although the EWS flow chart indicates that the nurse should contact the junior doctor if the threshold is breached, their data demonstrated that the nurses directly called the outreach team, rather than adhering to the policy guidelines. This option was available to the nurses, as they have a mutual professional respect for one another and perceived this contact to be non-threatening and invariable. Indeed, they were confident when dealing with other nurses, even though those nurses were senior in rank and experience.

2.4.2 Organisational infrastructure

This section overviews issues highlighted within the literature relating to the healthcare providers' infrastructure that is shown to influence ward nurses' recognition and response to patient deterioration. Globally, patient safety is a fundamental health issue, as it affects both patient outcomes and health care systems (World Health Organisation (WHO), 2016). Patient safety is defined as,

> *Absence of preventable harm to a patient and reduction of risk of unnecessary harm associated with health care to an acceptable minimum* (WHO, 2017a, p. 13).

The current problems facing the NHS are the reduction of junior doctors' hours through the implementation of the European Working Time Directive. There are also concerns that senior doctor cover has not been expanded to fill those gaps, coupled with the difficulties in recruitment and retention of medical and nursing staff and an increased usage of locum and agency staff to cover (Hogan et al., 2019). Organisational infrastructure plays an important role in relation to the deteriorating patient, as the healthcare providers need to demonstrate adequate provision of the support mechanisms to enhance early recognition and response to the deteriorating patient. Within most of the studies reviewed, they offered little or no insight into the appreciation of this infrastructure. The high-profile reports, such as Berwick et al., (2013), Cavendish (2013), Francis (2013), and Keogh (2013), established the need to improve patient safety, as they all highlighted severe failings, along with the absence of a patient safety infrastructure in the majority of NHS Trusts within the UK. Therefore, improving patient safety has become a high-level priority for all healthcare providers, and the EWS system is one of the key performance indicators for all NHS Trusts within the UK. Therefore, the need for accuracy and accountability is essential (NHS England, 2019; NICE, 2016).

A definition of organisational infrastructure is:

> *The most basic level of structure in a complex body or system that serves as a foundation for the rest of the organisation* (Oxford English Dictionary).

In this section, I refer to the basic patient safety systems, such as medical and nursing staffing on the wards, EWS and RRS systems, locum staffing cover, ward workloads, effective leadership, teamwork, and communication. The latter has been categorised as a non-technical skill, as defined by Stubbings et al., (2012), and reported as supporting ward nurses to respond to patient deterioration. Twenty of the reviewed studies reported on their significance (Cioffi, 2000; Andrews and Waterman, 2005; Cox et al., 2006; Hogan, 2006; Endacott et al., 2007; Gazarian et al., 2010; Mitchell et al., 2010; Rattray et al., 2011; Ludikhuize et al., 2012; Hart et al., 2014; Massey et al., 2014; Cardona–Morrell et al., 2016; Azimirad et al .,2020; Chua et al ., 2020; Smith et al ., 2021; Minyaev et al., 2021; Burke and Conway, 2022 ; Chau et al ., 2022; Dresser et al ., 2023; and Fazzini et al ., 2023).

Endacott et al., (2007) reported several staffing-related issues that had an adverse effect on patient management. These included frequent use of casual or part-time staff, a widely variable staff mix from shift to shift, and staff shortages. This extended to the medical rota covering the wards; often, this would be junior doctors who were unfamiliar with the ward patients, having limited authority to change patient management plans. Therefore, the support mechanisms for the nursing staff were also limited, enhancing the difficulties encountered by the nurses when escalation of care was required. This process is highlighted through the negative emotional response of the nurses prior to activating the calling criteria and often in the context of medical-legal litigation. Nurses experienced fear, anxiety, nervousness, and uncertainty when activating the response. Indeed, they felt worried about doing 'the right thing' and were equally concerned about following the mandated policy and procedure correctly (Cioffi, 2000; Andrews and Waterman, 2005; Hogan, 2006; Azimirad et al.,2020; Smith et al ., 2021; Chua et al., 2022; Burke and Conway, 2022).

An example to demonstrate this is the patient's vital sign recordings. This is often seen as routine care. Although it has been identified as equally important in the delivery of care, it is frequently carried out by healthcare assistants, which is often due to the nurses' time constraints within the ward environment (Cardona-Morrell et al., 2016). Poor assessment of respiratory rates was observed in a few studies (Hogan, 2006; Mitchell et al., 2010; Rattray et al., 2011), which casts doubts on the effectiveness of the monitoring practice. The literature demonstrates examples where the track and trigger system protocols have not been activated, in addition to the assessment being compromised

by inaccessible and often broken equipment, plus an over-reliance on electronic monitoring (Endacott et al., 2007; Cardona-Morrell et al., 2016).

Despite the support in place to enhance detection of patient deterioration, nurses remain uncertain and anxious to activate the RRS in the face of patients meeting the required activation criteria. This is, in part, due to the emotional responses already discussed, plus the fear of incorrectly diagnosing patient deterioration and subsequently bringing a group of doctors together from other parts of the hospital. The nurses found taking on this responsibility very daunting, especially if they felt under-confident to do so (Cioffi, 2000; Massey et al., 2014; Azimirad et al., 2020). Inadequate trans-professional communication also featured as a factor relating to the delayed escalation response, and assessment skills were shown to be a variable and, in some cases, inaccurate (Andrews and Waterman, 2005; Endacott et al., 2007; Minyaev et al., 2021; Fazzini et al., 2023). Supportive teamwork was identified as an essential element in responding to patient deterioration (Cox et al., 2006; Chua et al.,2022) and those nurses who displayed strong leadership were more confident in responding to the deteriorating patient and had no hesitation in activating RRS to call for support (Hart et al., 2014; Azimirad et al .,2020).

A study conducted by Minyaev et al.,(2021), explored the views of 10 experienced RNs on the use of standing order prior to escalation of care for the deteriorating patient. Their discussions emphasised a dichotomy of views over the organisational patient safety infrastructure and protocols. The RNs expressed doubt, ambiguity, and cognitive dissonance when discussing the applicability of the escalation protocol. Interestingly, whilst the focus was placed on the protocol activation, the nurses felt their expertise was devalued. Similarly, it was noted the supportive measures within the protocol had the same effect with the less experienced staff members. The study concluded with the possibility of introducing standing orders for nurses to use for the initial clinical interventions, to prevent further deterioration of the patient's condition, once recognised. However, this may create more problems than answers as we have seen within the literature review. Whilst, I would agree standing orders may have a place within this level of care. This concept requires a deeper thought process as this would depend on a wide range of variables, such as those themes identified within this literature review. This area of practice is in need of investment, in training and

education, from a hybrid approach, before burdening the ward nurses with an additional challenge to their decision-making process.

Ludikhuize et al., (2012) examined how nurses and physicians appraise their own quality of care of the deteriorating patient in the preceding 12 hours prior to a patient either suffering a cardiopulmonary arrest or requiring emergency admission to ICU, compared to the judgement of independent experts. Their findings showed a discrepancy of opinions, which represented a patient safety issue. The patients experienced a serious adverse event in the face of the healthcare workers' perception of adequate care being delivered. Their understanding of the delay in care provision was in 31% of the cases, whereas the actual delay was greater (62% of cases) when reviewed by the independent panel of experts. The participants worked well as a team coordinating a holistic approach to the care of the deteriorating patient, yet the patients within this study continued to deteriorate, and the delays in treatment intervention were apparent.

2.4.3 Decision-making skills

Nursing practice is carried out in a busy clinical environment, and the decision-making is often a complex process (Ellis, 1991). Routines exist in the organisation of care to the patient but as previously discussed, a patient's condition could deteriorate, causing concerns for the care providers. The decision–making process of the nurses within many of the reviewed studies has been very vague. This area of interest has a wealth of literature; therefore, I can only determine that the authors have steered away from the indulgence of decision-making for this reason, as this could unintentionally hijack their research.

A nurse may have a hunch about a patient but be unable to articulate its basis. As explained in a previous section of this review, nurses describe an intuitive change in the patient's behaviour that triggers them to investigate in more detail. These include vital signs data, collegial advice, plus their own experience and knowledge. Hospital wards are unstipulated environments which cause uncertainty, leading to decisions being reached often without the support of vital data (Cooper et al., 2013; Massey et al., 2014). Furthermore, decision-making in uncertain situations has been linked to a few theories and models to help explain the unplanned reasoning used generically by nurses to inform their decision-making. Some of those theories and models are described as hypothetico-deductive reasoning with pattern recognition and intuition (Cioffi, 2000). These are discussed in more detail in the next chapter.

Within twelve of the reviewed studies, nurses claimed their decision–making to be intuitive/experiential, with some delving into more depth than others (Cioffi, 2000; Mink and Harvey, 2003; Andrews and Waterman, 2005; Cox et al., 2006; Wheatley, 2006; Endacott and Wesley, 2006; Chau et al., 2013; Cooper et al., 2013; Massey et al., 2014; Azimirad et al .,2020; Chua et al .,2020; Dresser et al .,2023). The examples of this concept are presented within the literature by nurses expressing their own interpretation of decision-making, with the majority leaning towards the noticed patterns in routine decision-making. Pattern recognition as a tool for interpretative decision-making has been shown to be an effective method to recognise and respond to the deteriorating patient (Mink and Harvey, 2003).

Cioffi (2000) explored the decision-making process during the nurse's initial assessment of patient deterioration through the lens of intuition. Her findings revealed the significance of pattern recognition in terms of subtle patient cues, which were subsequently acted upon to arrest any further deterioration of the patient. In contrast to this, Chua et al., (2013) reported missed cues by nursing staff delaying their decision-making to escalate care. Within this study, several issues were raised, some being the incomplete vital sign recording and the lack of their interpretation. The nurses' lack of ability to grasp the unfolding picture was demonstrated within the findings. Adequate clinical knowledge, knowing the patient, and assimilating the vital signs findings are essential for the correct interpretation of the data to assist the decision–making process (Gazarian et al., 2010; Pantazopoulos et al., 2012; Dresser et al.,2023).

2.4.4 Relationship between doctors and nurses

According to Stein, (1967, p. 700) doctors and nurses have shared a complicated relationship, often influenced by social status, gender, and power perspectives. Some authors believe that doctors' opinions of nurses were formed during the pre-Nightingale era. Nurses during this time "were not afforded a wonderful reputation" (Salvage and Smith, 2000, p. 20). Nursing transformed itself through the process of professionalisation, where the role of the nurse was redefined and the initiation of university qualifications were introduced (Germov and Freij, 2009; Herbert, 2007). Doctors continued to hold an unquestionable position within their clinical fields throughout the 1970/1980s, described as the doctor–nurse game owing to the power relationships between both. This relationship was hierarchical, and doctors were perceived to be superior to nurses

(Germov and Freij, 2009; Svensson, 1996). The power of doctors was perceived through their dominance of medical science and the monopoly of knowledge (Svensson, 1996). This concept continued into the 1990s, where medical science emphasised the importance of doctors. Nursing skills and training were undervalued within the clinical setting. Nurses were expected to remain quiet and ensure the smooth running of the ward (Svensson, 1996, p. 379). However, in the latter part of the 1990s it was noted that the doctor-nurse game had evolved, with nurses challenging doctors' opinions, offering their own advice, and being regarded with more respect (Germov and Freij, 2009; Carpenter, 1995).

The doctor–Stein (1967, 1990) originally described nurse game. Doctors had more of an influence over patients' care, even though in practice nurses guided and inducted the junior doctors into essential aspects of their career. In Stein's 1967 doctor–nurse game, the nurse, usually female, learns to care, while appearing to defer to the authority of the doctor (usually male). This subservience to the doctor was taught early on in medical and nursing training, according to Fagan and Garelick, (2004, p. 279). In Stein's work the junior doctors learned to play the game as they progressed through their career pathway, and nurses were taught, even before graduation, which playing the game brought rewards, such as good teamwork, acceptance, and mutual respect. Failure to play, however, resulted in conflict and the loss of career prospects (Fagan and Garelick, 2004, p. 281). Nurses wished to move from dependence to autonomy and mutual independence and increasingly questioned the "medical model of care," seeing themselves as champions of the holistic approach to care (Fagin, 1992; Svensson, 1996).

Interestingly, some authors (Fagan and Garelick, 2004) allude to this as game changing as some nurses mimicked doctors and redefined their roles within the medical domain, such as independent nurse consultants or advanced nurse practitioners. Nurses became increasingly more specialised and with this came along a new founded confidence in their own abilities, and, as a result, have a more equal footing with doctors in specialist practice (Fagan and Garelick, 2004, p. 279). Working as an advanced nurse practitioner, the latter rings true, as I encounter difficulties working as a senior nurse in emergency medicine. This is mostly due to the hierarchy of the referral processes to other teams that a doctor with even fewer years of experience than me would not experience, simply due to the fact they are doctors referring to doctors.

Within the reviewed studies, the relationship between doctors and nurses was identified as complex and presented itself when the nurses were seeking help. Nurses had difficulty in articulating subtle cues of clinical change of patients' well-being (Cioffi, 2000; Minick and Harvey, 2003; Andrews and Waterman, 2005; Chua et al.,2020). Nurses, it would seem, persuaded doctors to review patients utilising medical language they had learnt during their experiences. This method created connectivity to the medical staff, enhancing their credibility with the use of this language. As already mentioned, some nurses felt uneasy about the use of this language and became concerned if they used it out of context (Andrews and Waterman, 2005). The medical staff required objective information from the nursing staff, not subjective cues, to base their decisions. When asked, the medical staff found the nurses used unclear, ambiguous language when referring patients for review, making the process more difficult than necessary (Andrews and Waterman, 2005; Endacott et al., 2007). The art of referral was a recurrent theme, with several strategies used to influence the medical staff (Andrews and Waterman, 2005; Endacott and Westley, 2006; Endacott et al., 2007). However, this was not just using the right language to gain attention; it was also important to propose actions and discuss their expectations. The knowledge and skill of the doctor was also important, as this had an impact on the nurses' actions and confidence. The willingness of the doctor to seek further help if they were inexperienced within this area ranked highly. In Endacott and Westley's (2006) study, some of the participants indicated they would "fix" the doctors' mistakes and fill the "gaps". An important theme in their strategy included "getting the right doctor."

As an interesting contrast in Smith and Aitken's (2016) study, their participants highlighted the importance of confidence, not just in the medical staff ability and knowledge but also in the support staff surrounding them. The healthcare assistant (HCA) would be tasked with completing the vital signs and reporting any abnormalities to the trained staff. Therefore, "trust" was reported as a sub-theme in all the questionnaires. Some of the nurses appeared more comfortable with delegating this task to the HCAs, while others were unsure. All the registered nurses reported that the recording of the vital signs remains the responsibility of the trained nurse, hence the reason why some would only delegate this task on an individualised basis. Within this study, another sub-theme constructed that, to the best of my knowledge, was not mentioned in any other study. This was regarding the escalation process and the nurse having trust in the nurse in charge of the shift, who took on this responsibility. This is an

unusual situation, as all nurses endure the total responsibility for their own individual patient care. However, an interesting point raised is the importance of the nurse in charge, being clinically credible and trustworthy in relation to the escalation of this care. Unfortunately, its presence within the finding is brief. It would be interesting to discover any difficulties encountered by the nurse in charge when referring the patient to the doctor. This could have highlighted the role of the experienced referrer and elaborate whether this had any bearing on the priority of the referral. The more experienced nurses were more likely to use medical language and were more confident with the referral process than a less experienced nurse who needed further assistance (Andrews and Waterman, 2005; Cox et al., 2006).

Minick and Harvey (2003) indicated the need for nurses to describe their findings to the medical staff during their referral process. Nurses were willing to risk a negative response from the medical staff. However, when nurses were direct about the treatment response they expected, the medical staff tended to respond more positively. The nurses' confidence and knowledge of the situation during the referral process encouraged a positive response from the medical staff. If the nurses were known to the medical staff, there appeared to be a more relaxed approach and the clinical credibility of both parties commanded mutual respect, which may account for the ease in their referral process. The lack of detail within the findings of this specific issue raised makes it difficult for the reader to interpret these findings. The study by Endacott et al., (2007) alluded to the notion of clinical credibility, highlighting the differences in the skill mix of both medical and nursing staff as varied, and this created a barrier for the medical staff to respond to patient deterioration. As noted within the study, some of the medical staff was found to be inexperienced in managing the deteriorating patient. This is an important consideration when thinking of the nurse referral to the medical staff, especially if the nurse is also inexperienced within this area. It was observed that nurses needed to improve their skills in the art of referral and seek additional evidence to support their concerns and discussions with the medical staff, as overreliance on the physical capabilities of the patient could lead to a false representation of the occurring symptoms and a delay in the escalation process. Therefore, the researchers noted nurses need to improve their assessment techniques regarding the deteriorating patient. In addition, a study conducted by Chua et al., (2020) explored the experiences of junior doctors and nurses when dealing with the deteriorating patient. Their findings imply the escalation of care follows the traditional

approach i.e., nurse first calling the junior doctor (on-call) to review the patient. The narrative within this study suggests there are similarities between the nurse and doctor in the sense of not knowing what to do! Compared to the nurses, junior doctors reported a greater fear of criticism for unnecessary RRS activation. The study also reports that doctors learn to accept the medical hierarchical structure, but more importantly know their place within in. Consequently, it was suggested doctors are expected to display symbolic behaviour that creates an imagery of competence, which distinguishes them from other professionals. Therefore, there is pressure on both parties, i.e., the ward nurse reporting patient deterioration, and the doctor dealing with a situation, which may sit outside of their newly acquired professional skill, and knowledge. This was reported to evoke fear and reservations amongst junior doctors to escalate to their seniors, as found in the study conducted by Endacott et al., (2007) this combination reinforces succinctly the complexity within this field of inquiry, which to date remained unreported within the literature.

2.4.5 Education and training strategies

Following the changing profile of acute care, clinicians in partnerships with educational teams and institutions addressed the need for tailor-made education of the deteriorating patient, as the knowledge deficits in recognition and clinical urgency have been identified by numerous authors (McQuillan et al., 1998; McGloin et al., 2002). Smith and Poplett (2004) recognised that junior medical staff experienced difficulties when asked to contribute to 'Do Not Attempt to Resuscitate' orders (DNAR) and identifying those patients who had reversible versus irreversible conditions. This suggests that there is a lack of confidence in managing acutely ill ward patients. Therefore, Featherstone et al., (2005) designed a one-day inter-professional course in 1999 on the care and management of the acutely ill patient, known as Acute Life-Threatening Events Recognition and Treatment, commonly referred to as ALERT, which is taught in 150 centres throughout the UK (Smith et al., 2016). This specific training, plus in-house educational programmes, were delivered by critical care teams and incorporated into the basic training for medical and nursing staff (Smith, 2009; DOH, 2009). Assessing the impact of the ALERT programme, Featherstone et al., (2005) surveyed 329 practitioners' views of attending the ALERT course and found a significant improvement in the attendees' confidence, recognition, and knowledge when caring for the acutely ill ward patient.

Education was identified as an important factor in the recognition and response process in five of the studies within this review (Cox et al., 2006; Pantazopoulos et al., 2012; Chua et al., 2013; McDonnell et al., 2013; Hart et al., 2014). The continuing education programmes were deemed as imperative to maintain the skills and knowledge pertaining to this recognition process (Cox et al., 2006; McDonnell et al., 2013). A significant predictor of the nurses' ability to recognise deterioration was the level of training received (Pantazopoulos et al., 2012). More recently, training using simulation techniques, including the Advanced Life Support (ALS) course, have been introduced. Many authors believe that education, experience, and practical training in simulation has a definitive influence of the management of the deteriorating patient (Cooper et al., 2011; McDonnell et al., 2013; Bliss and Aitken ,2018; Cooper et al., 2020). This methodology is widely used in gaining psychomotor skills, including aseptic technique, resuscitation skills, and observation of vital signs (Witt et al., 2010). The emphasis of this training is to prepare nurses to replicate real-life situations that they may face within clinical nursing practice (Cioffi, 2000). Benefits of simulation training include the acquisition of new skills/knowledge within the confines of a safe environment, without the nurse facing failure of the chosen task/procedure in front of his/her work-based colleagues. Moreover, this method will not compromise patient safety (Cooper et al., 2020).

Cooper et al., (2016) conducted a further study looking at the cost and clinical impact of face-to-face, web-based simulation programmes in relation to the management of the deteriorating patient. The study hypothesised that the web-based simulation programme would have a lower total cost, however, both programmes tested showed significant improvements to the recognition and response to acute clinical deterioration. In addition, Cooper et al., (2017) evaluated educational outcomes from a quasi-experimental design using an e-simulation programme. A total of 1,229 qualified nurses and 1,742 student nurses were recruited into the study, with both groups completing the online e-simulation exercise. The findings included improvement in the knowledge and performance for both groups as well as enhancing the students' preparation for practice and the qualified nurses' management of the deteriorating patient. Similarly, a study completed by Chung et al., (2018) investigated the educational impact of a web-based vs face-face simulation training of the deteriorating patient. 130 nurses completed this parallel training programme, with findings suggesting that both training strategies improved the nurse's knowledge,

competence, and confidence. The study had a recommendation for a blended approach to learning.

2.5 Summary

The studies reviewed have identified factors that influence ward nurses' recognition and response to patient deterioration. However, the depths are superficial, touching only the surface of the problem. Although research has been especially useful in identifying these factors, their individual significance has not been extensively studied. Therefore, it may be possible that some of these factors are more dominant than others, or act as catalysts to some. There appears to be repetition and commonalities shared within the themes and outcomes identified; the studies categorise those factors simply by generating a generic list without explaining the reasons why this process is repetitively failing. The rationale, research question, aim and objectives for this study were informed by this literature review. This process enabled me to identify the research gaps and construct a study to understand nurses' recognition and response to patient deterioration in more detail.

The research question, aim and objectives below aids to the context of their development considering this literature review.

Research question, aim and objectives.

My research question following a deep dive into the literature was to explore "are nurses missing cues of patient deterioration, as reported." Therefore, the aim of this study was to understand the process of nurses' recognition of, and response to patient deterioration in more detail. To repeat the objectives of this study, they are:

1. To identify perceived factors that may influence nurses' recognition and response to patient deterioration.

2. To explore barriers to this process and understand why nurses fail to appropriately escalate the care of the deteriorating patient.

3. To consider the impact of intuition, experiential learning, and knowledge on the effects of nurses' decision-making when escalating to a higher level of care.

Chapter 3: Theoretical frameworks

3.1 Introduction

As alluded to in the previous chapter, caring for the deteriorating patient is a multifaceted, and complicated process. The literature review highlighted numerous factors influencing nurses' recognition and response to patient deterioration, with the wider literature showing evidence of missed cues, lack of recognition, and the failure of nurses to escalate concerns of patient deterioration (Jha et al., 2013). Repetitive, reading of the literature encouraged me to question if nurses are missing the cues of clinical deterioration as reported, or are they simply lacking self-confidence, doubting their knowledge and experience, thus avoiding decision-making to escalate their patients' care? Many questions remain unanswered at this point. Using Braun and Clarke's (2006) six phases of analysis (see Table 16, p. 104), I searched for commonalities between each of the influencing factors identified from the literature (see Table 9). The following three themes emerged as common denominators providing a link between all the influencing factors mentioned:

Knowledge + Experience + Decision–making.

These themes are the foundations which either prompted action taken by the nurse to escalate the patient's care, or simply hindered this process, as discussed within the literature (Andrews and Waterman, 2005; Donohue and Endacott, 2010; Rattray et al., 2011). Due to the strong linkages of these themes to the influencing factors, I decided to utilise these themes to enrich my selection of the theoretical frameworks to help make sense of why nurses fail to recognise or respond to patient deterioration. The theoretical frameworks selected to underpin this thesis are as follows:

1. Benner (1984) from novice to expert **(Knowledge + Experience)**

2. The Cognitive Continuum Theory **(Decision-making)**

This chapter will present the selected theoretical frameworks, beginning with the rationale of choice, before moving forward to discuss the background information of each framework, the key concepts, plus their relevance to this thesis.

Abstract of text within the article	Identified themes	Linkage to influencing factors
"The quality of care preceding adverse events, was deemed substandard due to lack of knowledge and skill, and failure to seek advice" **Ludikhuize et al., (2012)**. "Despite the existence of this knowledge gap of Enrolled Nurses to correctly interpret vital signs changes, they were asked to collect the vital sign data, often without supervision. This raises serious concerns about the quality of vital sign monitoring and patient safety" **Chua et al., (2013).**	**Knowledge**	Assessing the patient Intuition Knowing the patient Vital sign monitoring EWS System Communication Accessing support Organisational infrastructure Decision-making skills Education & training
"The quality of the assessment was influenced by factors such as the expertise of the individual nurse" **Endacott et al., (2007)**. "Knowing the specific patient, past experiences with similar patients, and patterns built –up enabled the nurse to recognise patient deterioration" **Cioffi, (2000).**	**Experience**	Assessing the patient Intuition Knowing the patient Vital sign monitoring EWS System Communication Decision-making skills Education & training
"The selection of appropriate vital signs measures and responses to these appears to be influenced by nurses' clinical judgement" **Cardona-Morrell et al., (2016)**. "Many times, nurses reported the changes as a different behaviour; knowing something was intuitively not right. They noticed a change in mood, or the patient was quieter than before. This influenced their decision to escalate the patients care" **Minick and Harvey, (2003)**.	**Decision making**	Assessing the patient Intuition Vital sign monitoring EWS System Communication Accessing support Organisational infrastructure Decision-making skills Education & training

Table 10: Examples of identified themes generated by thematic analysis (Braun and Clarke, 2006) and then linked to the influencing factors derived from the literature.

3.1.1 Rationale for each of the theoretical frameworks selected.

Nurses' use of intuition is reported from the outset within this field of inquiry. It ranges from the selection of knowledge used to recognise patient deterioration to its development with experience, and then finally its use within the decision-making process. My selection of the theoretical frameworks reflects the use of intuition as a key tenent imbedded within both frameworks. The combination of the two frameworks will help to explore and assist the understanding of why nurses are missing cues of patient deterioration, as reported.

3.1.2 Benner (1984) from Novice to Expert (Knowledge and Experience)

Benner's (1984) 'Novice to Expert' theory examines the way novice and expert nurses make decisions generated from data derived from practice. Benner hypothesised that clinical decision-making expertise is developed through experience progressing through the five stages of skill proficiency, which are as follows: novice, advanced beginner, competent, proficient, and expert. At the latter stage, nurses can understand and make decisions intuitively (Benner and Tanner, 1987, p. 16).

Intuitive decision-making was a prominent theme highlighted within both the literature and the findings of this study, with nurses claiming their decision-making to be intuitive. This has been identified as the most common process of recognition of patient deterioration (Cioffi, 2000; Massey et al., 2014). It would appear from the literature that nurses are relying on their experience more, rather than their knowledge base to inform this practice. This theory is synonymous with the application of intuitive decision making in nursing. Its selection is owing to the wide, and board use within nursing to assist the understanding of the association between knowledge, experience, emotion, and the intuitive process when dealing with the deteriorating patient.

3.1.3 The Cognitive Continuum Theory (Decision-making)

Some theories describe the decision-maker's transition from analytical decision-making to more abstract, intuitive strategies (Standing, 2008, p. 125). Analytical decision-making and intuition are not mutually exclusive, according to Hughes and Young (1990, p. 190), as they suggest they complement each other. My selection of this theory is due to its balance of intuition and analytical reasoning, as it offers a diversity of individual cognitive strategies to be used, which is suitable to this area of inquiry due to the

uncertainties encountered when dealing with the deteriorating patient (Thompson, 1999b).

This theory will assist the understanding of how nurses formulate their decision to escalate the patient's care. The use of this framework may identify if the nurses are favouring the intuitive decision-making model as opposed to the analytical model. Finally, the use of this theory would also synthesise both selected theories together and combine an assisted understanding of why nurses are continuing to fail to recognise and respond to patient deterioration.

3.2 Background information and key concepts of each framework

3.2.1 Benner – skill acquisition theory from Novice to Expert

Benner's work is the most influential in the field, relating to skill acquisition and decision-making in nursing (Banning, 2007; Aitken et al., 2011). The link between intuition and expert practice is attributed to Benner's (1984) phenomenological study exploring clinical expertise in nursing, the outcome of which led to the development of a model describing the transition from a novice nurse to becoming an expert. Five levels of proficiency and intuition were utilised derived from clinical practice (see Table 9). This work conducted by Benner was influenced by the Dreyfus and Dreyfus 1980 model of skill acquisition, in which they described how expert nurses in practice applied intuition to their everyday patient care, using the following six fundamental attributes of intuition:

- **Pattern recognition**
- **Similarity recognition**
- **Common sense understanding**
- **Skilled "know how"**
- **Sense of salience**
- **Deliberate rationality**

The above six attributes are established cognitive skills (Rew and Barrow, 2007). As noted, no emotions are included within the list. Emotions are known to be influential in the use of intuition, as highlighted in quantitative studies (McCraty et al., 2004; Radwin, 1995) and qualitative studies (Pyles and Stern, 1983; Rew, 1988). Benner's (1984) model

focused on cognitive abilities and skill acquisition providing a link to the nurses' intuitive perception of their own experiences. Intuition is found not to be exclusively a cognitive skill, as it involves emotional, physical, and spiritual elements, making this a multidimensional concept (Smith et al., 2009). Benner's work accentuated the Dreyfus model by considering incremental skill performance based upon experience and education. Her research involved retrospective accounts based on clinical scenario events through the nurses' accumulation of different patient experiences. According to Benner, this helped to infuse the nurses with an intuitive response using pattern recognition. Controversy arose surrounding Benner's research, due to the nurses' retrieval of this information, selection, and organising capability – factors that were not addressed within the study, therefore, casting a dubious validity on the study outcomes (Eraut, 1994).

Skill Level	Description of the skill level
Novice	Those with no experience who are expected to preform and depend on rules to guide their actions.
Advanced Beginners	Those who demonstrate acceptable performance, and can note recurrent meaningful patterns, but are unable to prioritise between them.
Competent	Those who have been in practice for the past 2-3 years and begin to understand long-range goals, which help their efficiency and organisational skills.
Proficient	One who perceives situations rather than in terms of just aspects of the problem.
Expert	Those who no longer rely on an analytical principle of rules and guidelines, and who have an intuitive grasp of situations to connect an understanding of the situation to an appropriate action.

Table 11: Benner (1984) from Novice to Expert theory

However, in contrast, one of the strengths of Benner's theory (as illustrated by Table 10) is the simplicity of this model, ranging from a slow and cautious decision-maker to a confident expert with strong skills in decision-making. It captures the relationship between knowledge and experience, plus the involvement of emotion used within the intuitive process (Benner et al., 1992; Jenks, 1993). Nurses' self-confidence has been shown to have an influential effect on decision-making. This was demonstrated in Radwin's (1998) study, where nurses gained confidence with experience, and the confidence therefore accelerated the nurses' timeliness in the decision-making process.

3.2.2 Humanistic-intuitive approach to decision-making, also known as the skill acquisition model.

Benner (1982, 1984) explored intuition within nursing, developing the skill acquisition model. This model identified the shift from analytical thinking to a more intuitive strategy for clinical decision-making in nursing. Benner validated this theory through her research suggesting this transitional change from novice to expert is developed as the practitioner naturally moves towards the expert level, and this is achieved through experience (Benner, 1984; King and Appleton, 1997).

The use of intuition in clinical nursing has seldom been granted legitimacy as a sound approach to clinical judgement (Benner and Tanner, 1987). Intuition is characterised as a phenomenological spirit and is often described as a 'feeling of knowing without a rationale' (Benner and Tanner 1987; Saadait and Kenari 2012; Thompson, 2014). Numerous authors have sought to identify the defining attributes of intuition. Schraeder and Fisher (1986) suggested that intuitive perception in nursing is the ability to view the whole clinical situation and resolve problems with limited information. Meanwhile, Rew (1988) implied that intuition is described as 'knowledge' of fact or truth, independent of the linear reasoning process, with a similar finding offered by McCormack (1993). Intuition is often described in terms of a 'gut feeling, sixth sense, instinct, and common sense,' which has led to associate intuition with mysticism, allowing science to depreciate its legitimacy in the role of clinical judgement (English 1993). One of the main reasons for this is that hypothesis testing is not required, which has raised much scepticism as to whether this approach is empirically based (English 1993; Cash, 1995; Banning 2007). In addition, this raises the question of how it is possible for this body of knowledge to differentiate between the terms of a 'gut feeling' and simply an educated guess.

Rew (2000) conducted a three-phase study to validate an intuition assessment scale to provide a framework to measure intuition. After much debate, the original 50-item questionnaire was scaled down, firstly to 28 items following content validity index (CVI=96) covering six categories relating to decision-making as follows: uses/sudden immediate insight, creativity, risk taking, rigidity, cautiousness, and realistic approach. This scale was then further reduced to 21 items, to finally a seven-scale item. This is labelled as Acknowledges Using Intuition in Nursing Scale (AUINS), shown in Table 11 (Masters and Masters, 1989; Rew, 2000). Smith et al., (2004) also strived to develop a definition of intuition using similar factor analysis. They created their own 25-item questionnaire with seven factors as follows: physical sensations, premonitions, spiritual connections, reading cues, sensing energy, apprehension, and reassuring feelings. The latter authors' work contributed to developing a valid construction of intuition, however, according to Pretz and Folse (2011) there were numerous issues surrounding the measurement scales and they suggested this may be the reason the adoption of their definition within the literature is sparse.

Pretz and Folse (2011) conducted a study to test the hypothesis that the use of intuition increased with experience, using several domain-specific measures of intuition as well as generalised domains using the Myers-Briggs type indicator (1998) and the rational experiential inventory of Pacini and Epstein (1999). The selection of participants included nurses from a variety of backgrounds and experiences, ranging from student nurses to those with over 25 years of experience. Their conclusion, after testing their hypothesis, demonstrated an overwhelming use of intuition, with the more experienced nurses being more reliant on intuition when making clinical decisions, confirming their hypothesis.

Young (1987) conducted a study using a grounded theory approach to explore functional dimensions of nursing care and observed 41 nurses within clinical practice. This analysis included identification of conditions and attributes which facilitated intuition. These included: direct patient contact, experience, energy, self-confidence, and self-receptivity. The reflection on their previous experiences of decision-making was found to improve intuitive judgement. Contrary to previous thought, experience does not necessarily have to be clinical; some researchers would argue that life experiences also contribute to the development of intuition (Ruth-Sahd and Tisdell, 2007). The latter authors explored the use of intuition by novice nurses in a phenomenological study.

They demonstrated that this sample of novice nurses had comparable depth of intuition to that of experienced nurses.

Question	Scale item
1	There are times when I suddenly know what to do for a patient, but I don't know why.
2	I am inclined to make decisions based on a sudden flash of insight.
3	There are times when I immediately understand what to do for a patient, but I can't explain it to other people.
4	There are times when I know what will happen to a patient, but I don't know why.
5	There are times when a decision about my patient's care just comes to me.
6	There are some things I suddenly know to be true about some of my patients, but I am unable to support this with concrete data.
7	Sometimes I act on a sudden knowledge about a patient to prevent a crisis from developing even when I can't explain it.

Table 12: Acknowledges Using Intuition in Nursing Scale (AUINS) reproduced from Rew (2000).

Rovithis and Parissopoulos (2005) also described intuition as not an "exclusive characteristic of expert nurses". Similar to other authors, they also found that the novice nurse also experienced intuitive feelings in relation to patient care (McCormack, 1993). However, it was noted expert nurses used their intuitive feeling more skilfully and effectively in decision-making; they observed all levels of nurses demonstrating intuitive and analytical thoughts in their decision-making, similar to those found in King and

Clark's (2002) study. Benner's theory, despite its popularity does not account for the development of intuition and expertise well. The fundamental aspect of this theory is the fluid movement from novice to expert practice, these stages are poorly documented within the literature, with some of the supportive literature being weak. In Benner et al., (1996) study of nursing practice, the criteria used to allocate the nurses to the stages included the number of years of experience and their supervisors' judgements. The latter are documented within the literature as unreliable, as they don't often correlate with expertise (Ericsson and Smith,1991a). Moreover, an offering from developmental psychology suggests it's difficult to empirically establish the reality of movement within these stages as Benner has suggested, as this would require complex mathematics such as catastrophe theory and a wealth of quantitative data which is lacking in this case (Van-Der-Maas and Molenarr, (1992). Paley (1996) argues the term expert practitioner lacks clarity, and this forms the basis of the criticism of Benner's Model. Representative of those criticisms are four questions posed by English (1993, p 666):

How do we recognise the expert practitioner in the first place?

What is the relationship of internal and external criterion ?

What is intuition and how does it work?

How is intuition acquired?

The above are questions noted, adequate responses to them are absent from the literature.

Conversely, nursing practice is not just confined to the application of empirical knowledge; this is also gained from clinical experiences and exposure from working with patients. Gobet and Chassy (2008) claimed that this practical/experiential knowledge is learnt automatically and unconsciously through the repetition of nursing care. There is still uncertainty as to how intuitive perception is activated and how nurses arrive at intuitive judgements in uncertain circumstances, such as those concerning the deteriorating patient (Carnevali et al., 1984; Cioffi, 1997, 2010). The belief held by some authors is that intuition is the real 'art of nursing' which sits within the boundaries of aesthetic knowing or a 'tacit' personal knowledge (Chaffrey et al., 2012; Pearson, 2013; Melin-Johansson et al., 2017). The nursing profession is making significant steps to

support the development of nursing as a science, focusing on evidence-based practice; with this accomplishment, some authors would maintain this is neglecting the tacit or intuitive areas of knowledge (Tatano, 1998). Interestingly, current research offers a more conflicting argument, as the observation of tacit and intuitive knowledge combined with experiential learning is the main component for clinical reasoning. Therefore, the suggestion is that this is the modern-day equivalent to explain the prominence and role of intuition in relation to clinical judgement and nurses' decision-making ability (Jones et al., 2010; Forsberg et al., 2014). Melin-Johansson et al., (2017, p. 3,936) suggested that "intuition is more than simply a gut feeling, the process of which is based upon knowledge and care experience and has a place beside evidence-based care."

Cognitive psychology meanwhile offers a different train of thought in respect to the development and the use of expertise rather than intuition. Expertise, according to Eysenck and Keane (2020, p. 600), is an "elite peak in performance of a particular task, which resembles problem solving in which experts are extremely efficient in their domain of expertise". In the classic research "chess-playing expertise," De Groot (1965) presented chess players with board positions from live chess boards. Initially, the boards were in place then removed; the researcher then reconstructed the positions from the board. This research demonstrated that a higher percentage of chess masters recalled the positions more accurately than less expert players. Eysenck and Keane (2020, p, 601) concluded that expert chess players possess more intricate detail regarding chess positions stored in their long-term memory than non-experts, suggesting the use of pattern and similarity recognition drawn from past experiences to recall the chess positions.

In line with previous literature relating to expertise, the chunking theory offered by Simon and Chase, (1973), suggested that experts are hampered by the same cognitive restrictions as novices. An example given by the authors is that of attention, which can only be focussed to one thing at any one time, and visual short-term memory is limited to just four items. The same authors propose that experts and novices utilise the same problem-solving methods, such as means-end analysis, heuristics and progressive deepening which limits the number of situations to cognitively search. An example of this enables experienced chess players to perceive the board as chunks of pieces, not individually. These chunks are units of perception and meaning which are built

recursively, this data from chess provides robust evidence that chunks are used in different defining ways such as pattern recognition (Gobet and Clarkson, 2004; Simon and Chase, 1973). Some patterns that may reoccur for example in the environment may lead to the construction of chunks and more complex templates. Both of which are associated to long term memory information, and this in turn is linked to similarities (Gobet and Lane, 2005; Gobet and Chassy, 2008). The theory of expertise offers an alternative framework to consider as many of the authors within this field, suggest expertise theory also accounts for the key features of intuition in both nursing and within other domains (Gobet and Simons, 2000; Gobet, 2005; and Gobet and Chassy, 2008).

3.2.3 Benner's model and the deteriorating patient

The main concept of this theory is that decisions in nursing practice are often a result of intuitive perceptions, resulting in an almost unconscious level of cognition. This practical wisdom is developed through experience, which plays a significant role in routine decision-making in nursing (Schloes and Moore, 1997; Traynor et al., 2010). This theory demonstrates the synergy between intuition, knowledge, and experience, which are identified as crucial factors when considering the care and management of the deteriorating patient (Minick and Harvey, 2003; Cox et al., 2006). The literature pertaining to this field of inquiry demonstrated that intuition is the most common process of recognition of patient deterioration due to the nurse knowing the patient, or through pattern recognition, and the ability to interpret the presenting symptoms (Dreyfus and Dreyfus, 1986). In addition, nurses claimed their decision-making to be intuitive within the literature and within this study, derived from clinical experience, with an absence of the analytical elements of the decision-making process noted. This relationship resembles pattern recognition and the use of experiential knowledge to rationalise their decision-making (Minick and Harvey, 2003; Cox et al., 2006). Benner's theory is deep-rooted within nursing and as such, we as nurses, feel compelled to engage with this theory. This theory is undoubtedly influential and has proven strengths, however, it also suffers from many weaknesses. The theory only offers a partial explanation to understand why, and how nurses utilise intuition within this field of inquiry. Consequently, I decided to employ cognitive theory to enhance this understanding with a wider lens, to aid the generation of a collective, and a more holistic meaning of this phenomenon, this is discussed further in Chapter 6, p191.

3.3 Clinical decision-making models and frameworks

The complexity surrounding this area of practice is that nurses use different decision strategies. This depends on the "dynamics of the task, as a single nurse can use multiple strategies to reach a decision" (Jenks, 1993, p. 400; Cambell and Watson, 1995, p. 560). According to Baker, (1997, p. 43) factors therefore seen "to influence one method of decision-making may not have the same effect on another decision strategy", making this exceptionally difficult. Much of the literature surrounding clinical decision-making in nursing is presented in two main categories: systematic rational, which will be briefly summarised within this section; and the intuitive-humanistic approach, which has been discussed through the work of Patricia Benner.

3.3.1 Systematic rational – Hypothetico-deductive reasoning

An alternative framework used in nursing for clinical decision-making is the hypothetico-deductive model. This model was founded on the information-processing approach, where the decision maker interacts with the problem / task (Elstein et al., 1978; Joseph and Patel, 1990). The model therefore relies upon the short and long-term memory interactions that create the mechanism of information processing used in decision-making (Dowie and Elstein, 1988). The model defines decision-making as an interactional method attributing to the four components as follows:

1. Cue acquisition

2. Hypothesis generation

3. Cue interpretation

4. Hypothesis evaluation (Elstein et al., 1978)

This model encourages the decision-maker to search for cues and seek patterns in information gathering. For example, the nurse may read a medicine chart, a method of data collection, then supplement this information with cues obtained from their patient interaction, which may lead to further analysis to form the decision needed from this point of the care and administer the required medication. The hypothetico-deductive model comprises both inductive reasoning through hypothesis generation and deductive reasoning through hypothesis testing (Higgs and Jones, 2001, p. 482). Nurses seek information from multiple sources including vital signs, collegial advice, and use their own experiential and theoretical knowledge base as discussed within the

literature (Cox et al., 2006; Massey et al., 2014). This model uses a scientific approach to assist in cognitive reasoning by assuming that decision makers follow a logical pattern before arriving at their decision (Banning, 2007). Similar to the humanistic-intuitive approach, this model accounts for different levels of knowledge and experience. O'Neil et al., (2005) suggested that during the cue recognition phase, pattern recognition from experiences results in prompt processing. They claimed that the more novice nurse may struggle to understand the initial problem / task, compared to a nurse with more experience.

This information-processing model has been supported by numerous authors comparing novice and expert nurses (Boblin et al., 2008; Botti and Reeve, 2003; Lamond et al., 1996a). A study conducted by Offredy (1998) explored decision-making in a group of nurse practitioners in general practice, using structured interviews and observations of their consultations. Offredy noted that the nurse practitioners used hypothetico-deductive reasoning for low level and simple routine issues, and this remained the same in all levels of expertise. However, the more experienced nurses reported the use of intuition. It was also noted that when the task became more complex, the nurse practitioners reverted to the analytical model and abandoned their use of intuition.

3.3.2 The cognitive continuum theory

The authors of the cognitive continuum theory (Hammond, et al., 1967; Hamm, 1988) suggested that the structure of a task is analysed by its characteristics, and emphasised that individuals have a continuum of cognition, with analysis at one end and intuition at the other. The cognitive continuum theory combines the opposing ends of both categories, which characterises the uniqueness of this model. The main concept is that the type of task in hand influences the thinking mode that nurses adopt and, more importantly according to Hamm (1988), it is this pairing of both task and thinking mode that influences the accuracy of the decision made. In addition to this, the level of experience the nurse possesses would also affect the overall decision made.

The model is divided into six categories as illustrated in Figure 2, each representing a mode of inquiry, the first being the analytical hard-hitting science, to the intuitive stage occurring when a clinician is involved in decision-making – using little information to hand. This model offers a framework for the clinician to recognise the level of cognition prompted from the task in hand but does not offer any instruction or guidance. Dowie

(1996) suggested that this model is used to explain why empirical evidence is absent from decisions surrounding healthcare practice, and states most healthcare professionals operate towards the intuitive end of the continuum; but in contrast, most researchers operate towards the analytical end of the continuum. In addition, Dowie also suggested that whilst most healthcare professionals read and understand research, they lack the ability to relate the results to the ill-structured tasks they face in clinical practice.

Hunt et al., (1998) suggested this lack of analytical insight into the judgement and decisional basis of clinical practice is often blocked by the predominance of intuitive thought. This model brings together both science and intuition, with a very subtle implication that, when appropriate, clinicians should attempt to increase the analytical thought process, rather than just simply rely on intuition when faced with an urgent or complex clinical situation (Dowie, 1996).

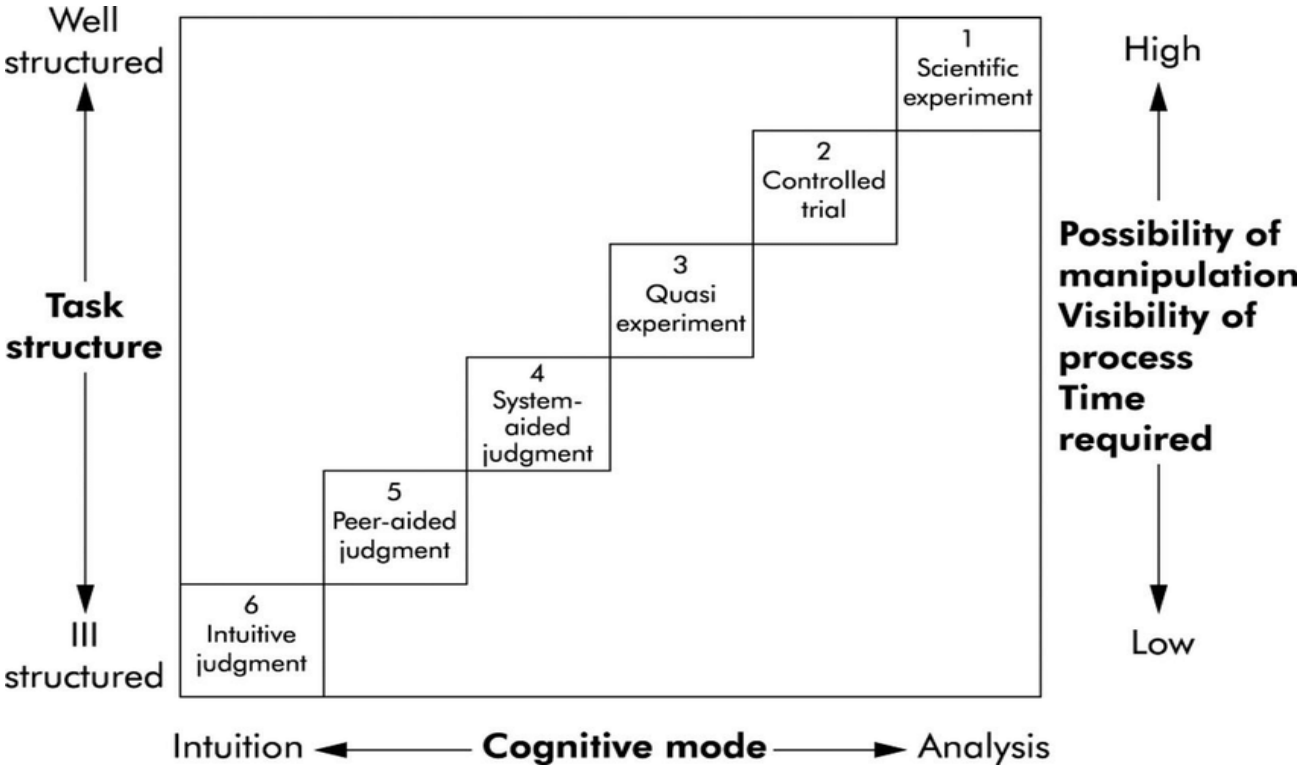

Figure 2: The Cognitive Continuum Theory Hamm (1988)

Clinicians are required to assess the clinical situation in which they find themselves, plus their capabilities and their thinking strategy. How the clinicians discover or decide which mode to use remains unclear. The pivotal debate is that the generic reasoning process

of people is more effective when the mode of thinking fits the task (Hamm, 1988; Hunt et al., 1998). However, the limiting time constraints in uncertain clinical situations influence nurses to develop a more rapid and intuitive mode of cognition, despite where they consider themselves to be located along the continuum (Hamm, 1998).

Standing (2008) later revised Hamm's model and successfully applied it to the decision-making process in nursing. This was revised owing to the original model being derived from psychology and not from a nursing discipline. She instigated changes within the model to incorporate the ever-changing judgement task reflected in nursing. As illustrated in Figure 3, changes made have not altered the fundamental tenants of the model, but instead she added an additional two modes resulting in nine modes of inquiry. The changes incorporated the use of research evidence to include clinical audit, survey, and qualitative research. This revised model also reflects patient judgement, ethical, qualitative, and quantitative evidence-based practice, and professional accountability, which Standing (2008, p. 129) claimed supports the complexity of decision-making reported by nurses. At present, there is no empirical evidence to suggest how nurses would apply this model in the uncertain clinical scenario, such as the care and management of the deteriorating patient.

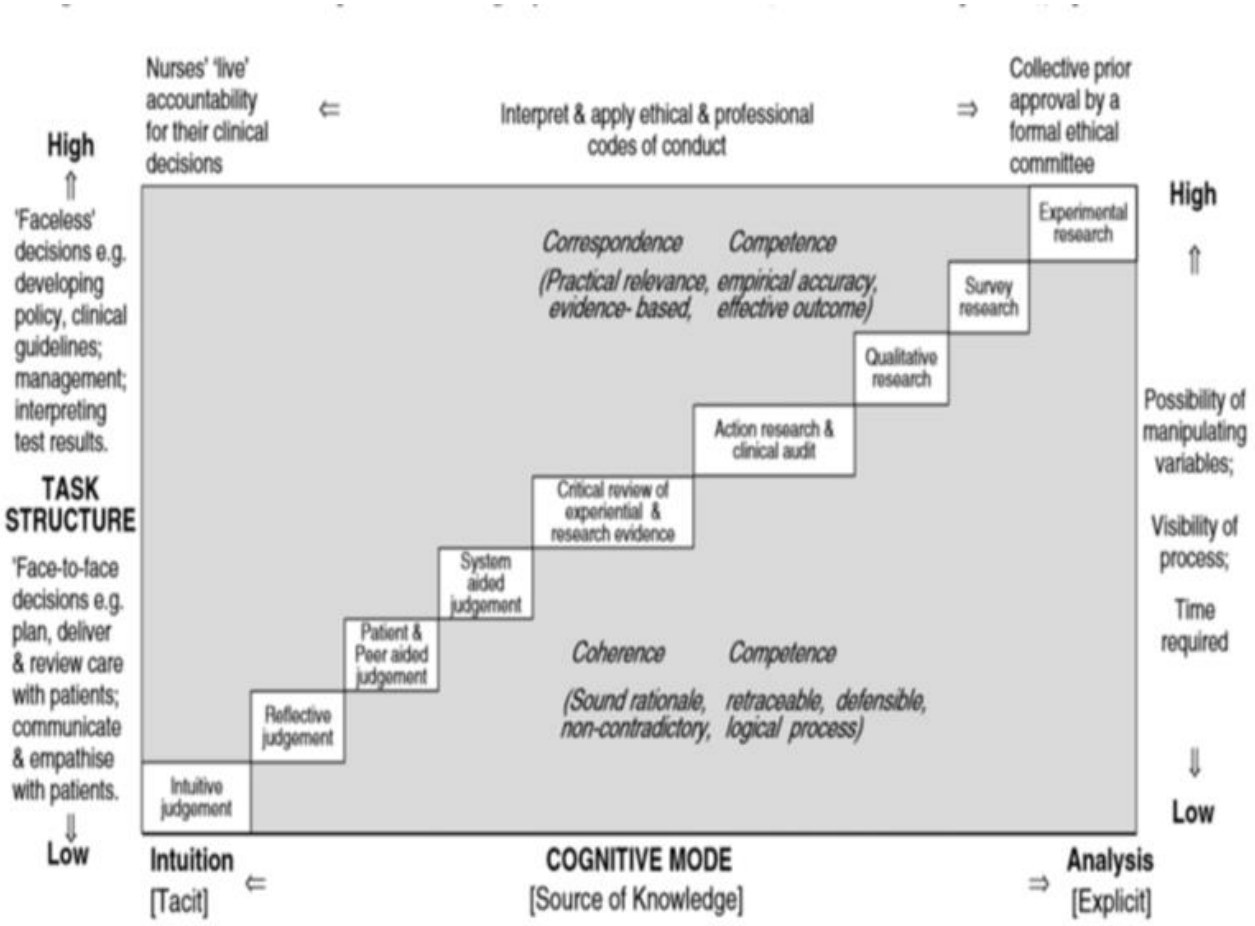

Figure 3: Standing (2008) Revised Cognitive Continuum Theory

The reality of clinical practice is that it is busy, dynamic, chaotic, and is often termed as messy (Schon, 1988), and this is certainly the case when dealing with acutely ill patients whose health suddenly deteriorate. Schon (1988) acknowledged that even when problem-solving methods are used, together with the 'technical rationality' of scientific evidence, the uncertainty of clinical practice and intuitive knowing contributes to clinical decision-making. Schon, (1988) conceptualised this by proposing the idea that there are limitations to using a purely positivist approach when dealing with the complexities of the real world.

3.3.3 The cognitive continuum model and the deteriorating patient

The cognitive continuum model suggests that the structure of the task can be analysed according to its characteristics (Hammond et al., 1967; Hamm, 1988). As previously stated, this theory suggests that individuals operate in different modes of cognition along a continuum, which has analysis at one end and intuition at the other. Hamm (1988) stated that intuitive thought "involves rapid, unconscious data processing that

combines the available information by averaging it". This contrasts with the analytical thought process, which is carried out at a much slower pace, consciously and consistently (Hammond et al., 1967; Dhami and Thomson, 2012). Therefore, this theory suggests that the use of intuition is the most efficient mode of reasoning when faced with uncertain and time-limiting situations. A prime example of this is the rapidly deteriorating patient, whom the nurse recognises as being unwell, prompting action to prevent any further decline of health. The intuitive response is therefore immediate, the data collection is multidimensional from a variety of sources. In contrast, if the nurse decided to use the analytical mode of reasoning, such as protocol, or guidelines, and apply these to the deteriorating patient, the likelihood is the decision would be inaccurate, according to Hammond et al., (1967) and Hamm (1988). As highlighted in both the literature and within this study, this would account for the consistency of the nurses leaning towards their intuitive and experiential knowledge when dealing with the deteriorating patient, plus the use of intuition as the primary mechanism within the recognition process. This theory combines the two selected theories and offers the synergy needed to assist my understanding of the proposed question: are nurses missing cues of patient deterioration, as reported within the literature.

3.3.4 Intuitive cognition

While the combination of the two theoretical frameworks offers a descriptive understanding of this phenomenon, I am left with the residual thoughts of why the participants' selected intuition as the foundation for their decision-making process. To assist with this explanation, I explored what is known around the cognitive process of intuition which will be presented within this section. The literature to support this explanation is derived from cognitive psychology which presents a meaningful and logical account of this process.

Decision making based on unconscious, situational pattern recognition is referred to as intuitive (Klein, 1998; 2008). According to Evans and Stanovich, (2013, p 226) intuitive cognition involves one of two types of cognition deployed in reasoning and decision making. This process involves unconscious situational pattern synthesis and recognition, unconstrained by working memory limitations, independent of conscious control, large in capacity and rapid (Braddeley, 2003, Patterson et al., 2017, p 6). Simon (1992, p 155) has defined this rapid process of skilled intuitive cognition, as situational cue recognition that primes retrieval of an answer from memory. The type of cues was plentiful

according to the participants within my study, ranging from the patient not feeling very well, to being not as "chatty" as they normally are. Intuitive cognition is linked to emotions, meaning the output processing which is unconscious is then posted to consciousness as a "gut feeling," Bowers et al., (1990, p 82), this output was mentioned by the majority of the participants' which also aided their response to act. This process involves an unconscious comparison between the current situational patterns and the stored ones in memory from previous experiences. Therefore, a match between both generates a response based upon previous success recalling the situation, stimulating a potential mental course of action (Patterson et al., (2017, p 5). The latter is described within my own study by many of the participants, conceptualised as intuitive knowing as a component of their decision making, inducing their response to act.

3.3.5 Pattern recognition

There is a wealth of evidence suggesting that intuitive cognition involves a process of meaningful patterns, recognising a stimulus or cue as belonging to a pattern. The evidence to support this notion is derived from the Naturalistic Decision-Making literature (NDM) (Klein et al., 1995; Klein, 2008). Zsamok and Klein, (1997), investigated how professionals with high-ranking levels of expertise (e.g., firefighters) made decisions, which highlighted 80% of the participants, made their decisions based on intuitive pattern recognition. The perceptual nature of intuition is explained by pattern recognition, according to Gobet and Chassy, (2008, p 134). They elaborated on this point through the key role of "chunks and templates" referred to earlier within this section, in enabling relevant long -term memory to be accessed rapidly. Once the access is given to the long-term memory, this facilitates a pattern similar to one seen in the recent past to be recognised then an action, a solution, is automatically stimulated (Bechara et al., 1997; Simon, 1995; Gobet and Chassy, 2008; Klein, 1998; Eysenck and Keane, 2020). Evidence of intuitive cognition relating to pattern recognition can be viewed within other literature. When, making judgements under uncertainty, intuitive heuristics were thought to be used (Kahneman and Tversky, 1973), although according to Lopes, (1991, p 71) the results from the previous study could be interpreted as non-heuristic patten – based reasoning. According to Eysenck and Keane, (2020, p 660) there is much support for the Klein (1998) Recognition Primed Decision (RPD)model, used within expert decision-making. The analysis discovered experts from a variety of fields tendered to consider only one option at any given time. The model received little

attention within the literature when it was first published in (1986), owing to misinterpretation of the model, which contained two components, a fast, non-conscious, intuitive pattern matching, and then a slower pace of deliberate conscious followed by a mental stimulation. These two components match well to the CCT as described within the section previously (Hamm,1988) where the two components are divided into intuitive at one end, and analytic at the other. Klein et al (2010) attempted to revisit the use of the RPD model, through a further retrospective study examining fireground commanders. However, this attempt was flawed with some interpretive issues as identified by Launder and Perry (2014), who pointed out the commanders are often instructed from initial radio contact, thus challenging the concept of pattern matching of the situation to the stored long-term memory. The latter authors conclude, pattern recognition plays a vital role in expert decision making when faced with the need to make a rapid decision, and argued that, decision making, within this context is more complex than assumed within the RPD model. Eysenck and Keane (2020) evaluation of this model concluded, there are several limitations to the model. For example, the model provides only a general outline of expert decision making with little detail, plus the data was extracted from real life situations (uncontrolled), therefore, difficulty arose in the identification of the key factors triggering the experts' decisions.

3.3.6 Transitional intuition

Lyneham et al., (2008) conducted a phenomenological study to explore the experiences of intuition in emergency nursing in relation to Benner's model, with particular focus on the 5th stage (Expert). The analysis revealed intuition is a developmental aspect of clinical practice and that the knowledge and experience is entwined in the nurse's professional being. The paper offers several interesting insights, one being the transitional phase of intuition. It was noted this phase is a sequence containing themes connecting cognitive and embodied intuition. They state during this phase, emotions, themes of knowledge and experience are connected from the unconscious, and posted to consciousness where they then become evident, as previously described by Bowers et al., (1990). During this phase, the authors claim intuitive thought process is often denied, and their participants question their own actions. This phase becomes embodied intuition once the nurse has complete trust in his/Her's ability in what they know. Lyneham et al., (2008) conceptualised cognitive intuition associated with knowledge and experience, as being an external criterion,

and transitional factors associated with feelings, and trust, is embodied intuition which are internal criteria.

3.3.7 Procedural memory and Knowledge

Several authors have proposed that situational patterns recognised by intuitive cognition can be implicitly learnt (Hogarth, 2001 and Hammond, 2007). Implicit learning refers to learning without conscious intention, and therefore, without full awareness of what has been learnt (Berry and Dienes, 1991; Destrebecqz and Boyer, 1998). The concept of intuitive cognition being implicitly learnt is supported by Patterson et al., (2013) who illustrated that it is possible for intuitive decision -making to be developed by implicit learning, and intuitive cognition is likely to be developed in part, by the process that governs implicit learning. Patterson et al., (2017) acknowledges the latter extends to the "expertise" literature, proposing the description of how professionals, such as firefighters learn to make decisions, is a prime example of this concept (Klein et al.,1995, 2008).

Procedural memory refers to the unconscious memory of invariant, relationship knowledge that supports skill development, and is acquired, and tuned through experience (Squire, 2009; Patterson et al.,2017). An early study by Cohen and Squire, (1980) examined amnesic patients' ability to learn a pattern analysing skill, and concluded that despite having amnesia, the skill was developed at the normal level, recognising the unconscious memory for patten analysing skill, (procedural memory), as opposed to declarative memory, (conscious recollection) which is affected by amnesia. According to many authors procedural memory is dissociated neurologically from declarative memory (Cohen and Squire, 1980; Poldrack et al., 2001; Squire, 2009). Procedural memory has been identified as a component of intuitive cognition (Patterson et al.,2013), whereas declarative memory is a known element of the working memory and is categorised as a component of analytical cognition (Evans and Stanovich, 2013). Patterson et al., (2017) concluded that intuitive cognition is likely to be supported by procedural memory, which is associated with skill development, through experience. This evidence clearly outlines, and demystifies the intuitive process as being "mystical," and absent of a scientific rationale, of its conception, and utility, which extends to the appreciation of skill acquisition, development, and experience which is of particular interest in relation to my own study.

3.4 Summary

The application of the CCT, and further clarity offered by cognitive psychology in relation to the conception, and utility of intuition; has facilitated a deeper understanding of knowledge that informs the nurses' decision-making ability, when dealing with patient deterioration. Nurses tend to lean towards their intuitive and experiential knowledge to aid their understanding of patient deterioration (Cox et al., 2006; Massey et al., 2014). This is due to pattern recognition from experiences and from lessons previously learnt (Benner, 1984). Benner's theory, focussed on the knowledge and experience, but fails to elaborate on how both are incorporated into the intuitive process. On further scrutiny of Benner's theory this highlighted its strengths, and some weaknesses, which has led to gaps in my understanding due to some poorly defined assumptions contained within the theory, which will be discussed within Chapter 6, p191 in more detail. However, the question remains, are nurses missing cues of patient deterioration, as reported? This thesis will endeavour to answer this question.

Chapter 4: Methodology and research design

4.1 Introduction

This chapter will explain my position and the consistency of the study design. I will convey my thoughts on how the chosen naturalistic paradigm and methodology are linked to the constructivist approach, to explore the phenomenon of interest. As mentioned, while the data collection process shares some similarities with the more traditional approaches there is a distinct non-allegiance to any (Percy et al., 2015; Kahike, 2014). Therefore, interpretive description (ID) was chosen as the methodological approach to enable a better understanding of the complex, experiential clinical phenomena within this field of inquiry (Thorne et al., 1997). This study is justified from its philosophical underpinnings, and the elements of ID, the ethical approval, participant recruitment, data collection, analysis, and trustworthiness are discussed and rationalised within the following sections.

4.1.1 Exploration of Phenomena

There is a wealth of research in this area of inquiry, which depicts the multi-professional interplay when caring for the deteriorating ward patient, as discussed in previous chapters. The overarching studies have concentrated on recognition and response, and the implementation of strategies to help minimise those issues identified, namely the EWS and RRS. As discovered, the research within this area of inquiry is repetitive in highlighting the failure of nurses to recognise and respond to patient deterioration ((McQuillan et al., 1998; Ludikhuize et al., 2012; Allen et al., 2017).

As frontline staff, nurses are intrinsically linked to this process. The question for me as a researcher is why are nurses missing cues of patient deterioration as reported within the literature? To create a deeper understanding of this phenomenon, I realised this would require a different approach involving consideration of the wider contextual factors involved within this area of practice. Therefore, the methodological decisions needed to be sympathetic towards these complexities to understand this phenomenon (Crotty, 1998; Boyd, 2001). This element of practice is not suited to objective measurement. Therefore, this chapter will discuss how the constructivist ID approach enables the researcher to explore the processes involved in the way nurses care for the deteriorating patient. This is accomplished through the subjective accounts of participants, regarding how they recognise deterioration, their response, how they

perceive their interactions with other professionals, and finally the factors that influence this area of practice. Until now, this sphere of practice has only been partially explored, and this study is helpful in providing further explanation and understanding of the phenomenon in question. Furthermore, this chapter presents the legitimate claim of how an exploratory approach fits well within the naturalistic, constructivist, and interpretive paradigm, which enables the researcher to remain within the participants' domain of clinical practice.

4.1.2 Role of the researcher

I have worked within this field of inquiry as an Advanced Nurse Practitioner assigned to a Medical Emergency Team (MET) of sorts for the past 16 years. I am trained in the areas of critical care, oncology, and emergency care. My role is to respond to an MET call once it has been activated by the ward nursing staff if they suspect patient deterioration. I attend to the patient, either with my medical colleagues or independently, and perform clinical interventions to prevent further deterioration of the patient's health, or alternatively I escalate the patient to the appropriate level of required care. Whilst attending to the patient in the ward, we collectively enhance the support given to nursing and junior medical staff regarding the patient in question. My theoretical positioning as the researcher and clinician is recognised and strategies have been implemented to avoid bias. Those strategies will be discussed in more detail within this chapter.

4.2 Paradigm selection

The following section conveys and justifies the position of the study within the naturalistic, constructivist paradigm. Research is influenced and steered by a paradigm (Kuhn, 1970). A paradigm, therefore, is a framework that incorporates philosophical thought that informs the researchers' worldview of the nature of reality (ontology) (Crotty, 1998). The selected paradigm also assists researchers in determining their epistemological position, what is already known and how we come to know this knowledge; the researcher is acknowledged as either being part of the knowledge or as separate from it (Crotty, 1998; Guba and Lincoln, 1994). Methodology is influenced by ontology and epistemology in terms of how we gain knowledge about the real-world (Guba and Lincoln, 1994; Denzin and Lincoln, 2005).

The methodological approach I have selected is interpretive description, which aligns philosophically with the naturalistic inquiry as it recognises that the human experience

is constructed by, and dependent on, the context of the experienced phenomenon, but realises the potential for shared realities (Thorne et al., 1997, 2004). I have ensured the research question; aim and objectives, data collection process and the selected paradigm are inherently linked to each other within a perspective to create the fundamental foundations of my research, as guided by Guba and Lincoln (1994). Three alternative perspectives, namely positivism, post-positivism and the naturalistic paradigms, are considered in the following sections.

4.2.1 Naturalistic paradigm and research design

The naturalistic research approach is philosophically underpinned by the notion that human beings live in their own world and create their own understandings of reality (Lincoln and Guba, 1985). This approach was developed by social scientists during the late 19th and early 20th centuries. Other approaches include Positivism and Post Positivism. The positivist approach requires research to be conducted in an objective way, which is used to test theory through prediction and control (Sparks, 1992; Parahoo, 2006). Traditionally, a positivist researcher is distant from, and independent of, the field of interest, and collects the quantitative data to be empirically tested (Denzin and Lincoln, 2000). Similarly, Post-positivism has emerged from an evaluation of positivism, which was described by Kuhn (1970) as a paradigm shift. Post-positivist researchers hold parallel views to that of positivists, in the sense that they believe that external reality can be measured. The positivist and post-positivist paradigms reflect a realist stance, and consequently they have limitations in terms of exploring the participants' thoughts, beliefs, behaviours, actions, and interactions in the complex clinical setting (Allcock, 1997; Guba and Lincoln, 1994). Therefore, my position would be to decline both options due to their unsuitability to the focus of my research.

Researchers working within the naturalistic paradigm argue that control and manipulation inherent in positivist research is not appropriate for a study of the social world (Bryman, 2008). A generalist view of this paradigm is that this approach does not attempt to either measure or quantify, or to establish a relationship between data sets. Instead, it seeks to describe phenomena as experienced by the chosen participants, to allow the individual accounts to drive the research forward (Lincoln and Guba, 1985; Haase and Myers, 1988; Hammersley, 1995).

The stages of this research study were designed sequentially and pragmatically to further understand the themes already identified. In Phase One, the interview process offered a number of constructed themes, suggesting patterns, and linkages between

them, which aided some understanding of how the participants' assessed patient deterioration. However, there was also a great deal of ambiguous description which needed much more clarity. Subsequently, this formed the foundation of Phase Two which utilised a virtual patient simulation to observe the participants' assessment process. This conveyed some transparency to this process as the participants were navigated through the assessment of the virtual patient. The simulation consisted of five stages; each stage was delivered through a staggered release revealing physiological parameters for the virtual patient. The participants were asked to interpret these parameters and briefly describe their actions. Consequently, this process was decelerated giving the participants adequate time to elaborate on their, thoughts, beliefs, and interpretations at each stage. This exposed additional factors influencing the recognition of, and response to patient deterioration, which would have otherwise been hidden. This demonstrated the importance of a gradual approach to the assessment process allowing the participants' time to digest the question and offer a more informed, and illuminated response, which may have otherwise been overlooked by the conventional method of interviewing. Owing to the themes constructed within this phase, this guided the decision to develop a third and the final phase of data collection, which provided further theoretical insights. Due to the sequential nature of the data collection informing each phase development, triangulation was not appropriate within this study, however, there are a variety of verification strategies employed, that contribute to the overall validity, and credibility of the research findings as detailed within this chapter, 4.9.5 verification strategies p,136.

Due to the nature of the naturalistic inquiry, the findings cannot be generalised to other settings, or they will not prove or predict anything; some view this as a limitation of this paradigm (Koch, 1994; Morse and Field, 1996). The value of this approach is in sensitising the reader to aspects of the phenomena of which they were previously unaware, provided that the outcome of the research offers this information. It then becomes the responsibility of the reader to assess the usefulness of the research regarding his or her own concerns and experience. Moreover, the authenticity of naturalistic research can only be assessed by those with similar or direct experience of the phenomena, although it is accepted that others might draw some value from the research (Haase and Myres, 1988; Hammersley, 1995; Appleton and King, 2002). Within the naturalistic approach, the researcher is viewed as a social enquirer and therefore he or she enters the world of the participant, and to a greater or lesser degree interprets, constructs, and

describes that world through the experience detailed by the participant (Bryman, 2008; Coolican, 1996). There are two distinct perspectives within the naturalistic research approach, which are briefly discussed in the following section (Lincoln and Guba, 1985; Haase and Myers, 1988).

4.2.2 Interpretivist

In the mid-20th century, a paradigm shift away from positivism was observed, giving way to the more naturalistic ways of thinking in research, which enhanced the credibility of other theoretical perspectives, such as interpretivist methods (Denzin and Lincoln, 2005). The main concept of interpretivist research, according to Giddings (2002), is for the researcher to understand the "varied" experience of the participants, the meaning of such experience, and how this relates to their perceived world, with the emphasis on "varied". According to Gadamer (1960/1998), understanding and interpretation are the same thing, the latter being a well-known theory by Gadamer, relating to his work, and the study of hermeneutics and the process of circular understanding.

This perspective depicts the role of the researcher as being primarily about interpreting the social world. According to Morse and Field (1996), it is assumed that researchers explore the social world, which is not fully understood and open to authentic representation. The issue of the researchers' own bias and agenda is addressed in Husserlian phenomenology by bracketing their own assumptions, past experiences, and beliefs (Husserl 1954/1970). In grounded theory, this is achieved by delaying the use of the literature, remaining engaged with the data collected and avoiding frameworks to short cut the development of a theory (Glaser, 1978/1992). Interpretive description guides the researcher to demonstrate interpretive authority, by checking their own construction of knowledge, themes. with the participants, which is incorporated as verification strategies within this study (Thorne et al., 2004).

As a novice researcher, I am a part of the social world that I am investigating as a clinician, and familiar with the literature. Moreover, I would find some of the aspects described above difficult to achieve. Therefore, my decision would be to reject this position, although the selected methodology for this study would provide linkage to an interpretive perspective and, as the name suggests, interpretive description takes a broad naturalistic approach to research (Thorne, 2008,2016).

4.2.3 Constructivist

There is a belief that with this perspective, it is impossible to ensure that the data collected reflect reality, rather than the researcher's own version of things, as all social knowledge is intrinsically constructed (Parahoo, 2006; Appleton and King, 1997). The way that knowledge is theoretically constructed has been debated for many years (Crotty, 1998; Carter and little, 2007). Some authors have taken on the challenge of demystifying some of this debate, as follows: Denzin and Lincoln (2005) argued the theory of knowledge development is aimed at expressing how an individual's knowledge expands, whereas Schwandt (2000) claimed that epistemology acts as a precursor to the reasoning process behind theoretical perspectives, to create a new individual meaning of what knowledge is.

Constructivism, as a theory of knowledge, assists in our understanding of what knowledge is and how we can acquire that knowledge. Subjective epistemology has an expectation that people self-reflect, interact socially, and generate meaning from this experience within their own physical environments (Crotty, 1998). This is the premise in which interpretive description builds its philosophical foundations, with the emphasis on the individual and how he or she interacts or socially constructs meaning or co-creates understanding (Thorne, 2004; Denzin and Lincoln, 2005). Consequently, the researchers who embrace this approach cannot avoid making their own construction of the social world whilst investigating it, as research is concerned with generating new knowledge or further understanding of the knowledge within the area of inquiry. This is done in partnership between the participants and the researcher collectively (Lincoln and Guba, 1985; Hammersley, 1995).

Constructivists believe that participants may think differently in different contexts relative to the situation, therefore, their actions are open to interpretation by any given observer (Appleton and King, 2002, p. 643), whereby they maintain a relativist stance. Thus, constructivists argue that reality exists concurrently in the minds of different participants who are socially constructed and that everyone will take a unique position regarding the phenomenon (Charmaz, 2006). This approach was considered an appropriate strategy for this study due to its perspective that multiple realities can exist, in addition to the diverse knowledge and experience of the participants regarding the phenomenon. The domain that my inquiry impinges on is created by a subjective epistemology, that the researcher and the participants can work together to co-create a deeper understanding of the phenomena in question (Denzin and Lincoln, 2005).

4.2.4 Social construction of reality

The term social construction of reality was introduced by Berger and Luckman (1966), who claimed that over time, people, and groups interacting in a social system develop knowledge and beliefs of what reality is through their life experiences. Their work in the mid-1960s also portrayed the notion that where we were raised, what we were raised to believe, how we are perceived by others, and the way we present ourselves to the world are factors that form our perception of reality, which is socially constructed by our beliefs and background (Berger and Luckman, 1966). Thus, construction of knowledge is dependent on exposure to the life experiences of the individual and, consequently, this experience is converted, consciously or unconsciously, into a personal insight that forms our experiential knowledge (Caron-Flinterman et al., 2005, p. 2,576).

One could argue that nursing is a complex social system that involves interaction between patients, visitors, and colleagues (Kivilliene and Blazevicene, 2019). Interactions, when dealing with the deteriorating patient, relay a story about human interplay and relations. Therefore, repeated exposure to those experiences forms the foundation of a nurse's accrual of their experiential knowledge, according to Caron-Fliterman et al., (2005, p. 2,576). However, it is only in recent years that experiential knowledge has come to be valued in terms of clinical knowledge, (Henderson and Henderson, 2010). Furthermore, epistemic discrimination is evident, as described by midwives whose expert knowledge is not valued in obstetrics (Dalmiya and Alcoff, 1993, p. 217). Nursing knowledge has also been subject to a form of discrimination, with the use of intuitive knowledge combined with experiential knowledge (Benner et al., 1992; Botti and Reeve, 2003). There are elements of epistemic discrimination present within this study and, interestingly, the participants unconsciously hold this notion themselves. This is also apparent from their responses to one of the main themes in relation to collegial relationships. The data collected reflected the participants' social construction of their own reality, discovering multiple themes that influence this area of practice, and correspond with themes generated within other studies concerning this phenomenon. This will be discussed further in Chapter 5 (Gazarian et al., 2010; Cooper et al., 2013; Douw et al., 2016).

4.3 Philosophical underpinnings of the study design

4.3.1 Epistemology and ontology positioning

Thorne (2008) claimed that research should have a clear theoretical perspective to drive the research forward. In this case, both ontology and epistemology are key drivers for this research. Understanding the nature of the recognition and response to patient deterioration from the nurses' experiences is central to this research. The aim, therefore, was to explore the reality of their experiences of patient deterioration. During the interviews, the participants' alluded to a variety of situations such as, feelings of isolation upon discovery of a poorly patient gasping for breath at 4 am, being the only trained nurse on the ward, as the other was on break, not knowing who to turn to for assistance. The decision-making process was burdensome to the majority of the participants' due to the scrutiny and responsibility that came along with this process, most described this being an overwhelming experience.

The participants' concept of reality became the benchmark for my ontological position within this study. As a clinician working within this field of inquiry, I could relate to this shared reality. This was achieved through the interview process channelling the participants' voice reflecting their reality, through their retrospective accounts of their experiences, when caring for the deteriorating patient.

The interviews also revealed, the participants' held onto the numeric nature of the EWS system to validate their escalation response, versus their own knowledge. It was noted within the study the participants' relied upon their experiential knowledge to inform their decision making. While there was an exclusion of deliberate pre-existing training prior to the study, I wanted to understand the significance of the participants' experiential knowledge in more detail, exploring, where, or what this knowledge is, how is it gained, and how valuable is this knowledge when caring for the deteriorating patient. The latter informed my epistemological position within this study (Thorne et al., 2004, 2008; Berger and Luckman, 1966).

4.3.2 Methodological position

The selection of the appropriate methodology for this study has not been as straightforward as I would like to portray. This area of inquiry is well placed within the naturalistic paradigm, due to the nature of this inquiry combined with the philosophical positioning mentioned within this section. The research approach is qualitative, but it does not follow the traditional approaches such as: Glaserian grounded theory (Glaser, 1978), Husserlian or classical phenomenology (Husserl, 1970/1900), or ethnography,

which are discussed most frequently within the literature and are viewed by some as foundational (Holloway and Todres, 2003). The initial methodological choice for this study was Heideggerian phenomenology, but it swiftly became apparent that the data collected would deviate from the methodological rules and guidelines which are deemed as acceptable for this tradition (Caeli et al., 2003). As my research moved forward, I struggled for the need of both methodological flexibility and structure. This study falls outside, or in-between, the boundaries of some of these approaches. Therefore, I decided to opt for a more generic approach, which would liberate the apparent rigidity of the methodological rules and provide a more pragmatic approach to explore this phenomenon with a wide-ranging lens.

My chosen methodology was interpretive description (ID), as this embraces a loyalty with the philosophical positioning determined by the intentions of this study (Crotty 1998; Mills et al., 2006; Birks and Mills, 2011). ID would provide the space for this study to blend established tenants of the more traditional approaches if required and allow the flexibility to explore the more complex clinical phenomena without any deviation from the selected paradigm (Caeli et al., 2003; Thorne et al., 2004).

4.4 Interpretive description – a generic methodology

ID was borne out of the idea concerning more generic methodology, to explore the social world without the need for the rigidity of the more traditional placed methods (Thorne et al., 1997). The emergence of ID reflects the variations to and the blurring of traditional methodologies (Thorne, 2008), as it "bears a similarity to grounded theory, and phenomenological ancestry" (Baker et al., 1992, p. 1,357). This methodology is rigorous yet non-prescriptive, as well as being unique in the way it retains elements of its methodological ancestry, which enhances its rigour, according to Thorne et al., (1997). Its application has been exclusively applied within the roots of health science, although the emerging international studies demonstrate its flexibility, based within other disciplines, such as education, art therapy and tourism (Hunt, 2009). Thorne and colleagues positioned ID as a methodological framework that bridges the gap between theory and the practice divide, to allow for the development of research questions from clinical practice (Thorne, 2008).

This methodology was selected due to the foundational underpinnings of this research, which was to explore the nurses' experience of patient deterioration from within their natural context, aligned with the study's purpose, and objectives. This included

conducting the study in a naturalistic context, and the data were therefore obtained as close to clinical practice as possible. Consistent with ID, this study explored the value of the subjective, intuitive, and experiential knowledge of nurses, as the fundamental source of insight. This methodology acknowledges the social constructivist element of human experience, recognizing multiple and often differing realities, and it acknowledges the shared relationship between the researcher and the object of the inquiry (Thorne, 2008). The primary goal of this methodology is to create a clinical understanding, while its secondary goal is to reapply this clinical understanding to patient care (Stubbs, 2008; Thorne, 2008). ID data collection encourages triangulation from multiple sources of data collection, although singular in-depth interviewing and focus groups are best served by this methodology (Hunt, 2009). The method of data analysis employs comparative and iterative methods to generate a broad understanding of the data (Hunt, 2009; Thorne et al., 1997).

4.4.1 Applied nature of interpretive description

The strength of this methodology is its suitability to theoretically underpinning qualitative research that answers clinical questions, which also depicts both its uniqueness and its limitations (Carlander et al., 2011; Thorne et al., 2004). Thorne (2008) proposed ID to answer questions that require an eye on the experience of illness. Therefore, the experiences of nurses who deal with the deteriorating patient are well placed to interpret, construct, and explore the questions that are generated, and then to apply the findings back within the clinical setting.

Once the data have been collected and analysed, the process of making sense of the findings follows. Thorne (2008) explained how researchers engage with the data to shift it beyond description. Making sense of the data began the minute it was heard in the interview, as if a light had been switched on – this made perfect sense to me. I then become more aware of the recurring themes during this time, due to the analysis of each transcript. According to Thorne (2008), this may begin as a description of the clinical phenomenon, then steadily introducing an element of interpretation as the meta-messages unfold conceptually. The methodological approach to the data analysis is inductive, as it seeks to "understand the clinical phenomena" which illustrate patterns, structure, and characteristics, according to Thorne et al., (2004, p.6). This works mutually with cyclical reading of the transcript as the data is collected with periods of pause, to encourage reflection, to gather some primary analysis before moving

forward. Thorne et al., (2004, p. 10) encouraged "the researcher to be thoughtful and analytical, to shift beyond an intuitive analysis, to a constructed and crafted analysis".

4.5 Methods: The research process

4.5.1 Introduction

This section describes the ethical considerations for the study, including the recruitment of participants explaining the procedures and techniques used for gathering and analysing data. The verification strategies and trustworthiness are also discussed.

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

Phase One: consisted of in-depth semi-structured interviews of nurses working within an acute NHS Trust, from a mixture of medical and surgical wards. The purpose was to collect initial data concerning the experiences of the participants in relation to the care and management of the deteriorating ward patient.

Phase Two: consisted of a simulation exercise, based upon a real-life MET call. The concept of this development derived from the initial interviews, owing to the participants' inconsistency with their approach to recognising and responding to patient deterioration. The participants interviewed in Phase One exited the study after assisting me with the co-construction of this phase, in terms of developing questions to use as a guide, to the nature, and the structure of this simulation exercise.

Phase Three: owing to the richness of the data collected, I decided to conduct focus groups to form the final stage of data collection. My reasoning was to encourage a third wave of data from a collective perspective.

4.5.2 Ethical conduct of the research

The ethical approval for this research was obtained in two stages due to the sequential, and pragmatic nature of the research, which follows the research design. Stage One of this process involved the Interviews and simulation. As the research was conducted within a local NHS Trust, ethical approval was sought jointly with Liverpool John Moores University (LJMU) – Ethics Committee (16/EHC/001), and the Local NHS Trust, Research and Development department (R&DI No:5078). Stage Two involved focus groups, and as above, joint approval was again sought from both, LJMU (19/EHC/002), and an added amendment to the original approval was accepted by the Local NHS Trust (R&DI No:5087), as the study was primarily sponsored by LJMU (see Appendix 2 and 3, p 279 & 289). Full approval and assistance were given to conduct this research. I attended

further research ethics training based at LJMU and discovered that an Integrated Research Application System (IRAS) application was not necessary as per the recommendation by the Health Research Authority in 2016 (Appendix 2, p 279). No ethical issues were raised during the execution of this study. Therefore, as the researcher I gained the confidence and assurance that the study was ethically sound, evidenced by the absence of any untoward incidents in respect of the participants' privacy, confidentiality, consent, beneficence, and non-malfeasance. None of the participants became distressed during any part of the data collection process. No professional issues were raised in terms of retrospective poor practice, and there were no significant events to report formally during the research process. Plans were in place to support any of the participants in relation to discovery of poor practice. All participants were given a detailed physiological explanation of the VPS (Appendix 7, p 295) and the opportunity to attend the ALERT, ILS or ALS courses as detailed in Chapter 4 as part of the endpoints for the study.

4.5.3 Informed consent

The most fundamental way to display your respect for others is by gaining their consent for actions that will affect them directly or indirectly (Draper et al., 2001). There is a moral, professional, and legal duty upon healthcare researchers to obtain informed consent for all participants prior to their recruitment into a study (NMC, 2018). This standard also requires the researcher to provide written information detailing the study, its purpose, the expected participation, and contact details of the researcher, in the form of a Participant Information Sheet (PIS) combined with an informed consent sheet (see Appendix 2 and 3). The recruitment strategies used within the study facilitated a process to eliminate potential role / research coercion (see 4.6.1 access to participants, p106). The third recruitment strategy was the most successful. This was completed by delivering a presentation on the selected wards and engaging with potential participants, those who volunteered, received a detailed participant information and consent sheet. Each potential participant was given a minimum of 24 hrs, as stipulated by the LJMU ethics committee, before signing and returning the Informed Consent Sheet, prior to recruitment into the study. The approximate enrolment time onto the study, was between (26-72hrs), leaving the participants adequate time to reach their own decision to participate (see Appendix 2 and 3, information & consent sheet, p 279 & 289, (NMC, 2008, 2018; RCN, 2011).

4.5.4 Confidentiality and Privacy

Research data is extremely sensitive; therefore, maintaining the confidentiality of the participants is a priority for both the researcher and the participant. The information given in the interviews is seen as personal to the participant. I maintained confidentiality through removing the names of the participants and issuing them with a study number, for example (P 01, P 02, P 03). The study number generated was placed into the recruitment log, which was kept separate from all research data, in a locked filing cabinet within a locked room, whereby the researcher was the only person with access to all this information. My decision here was simply the most basic option, which had been successful in my experience as a clinical research nurse. I maintained this role for a period of six years, during which time I gained experience in ethical submissions, data protection, recruitment, confidentiality, and the need for the privacy of the participants.

Privacy: This consists of various levels, sensitivity of the data, information gathering, voice recordings, and the dissemination of the results, all of which are discussed in the following sections with respect to data management. The one-to-one interviews were completed in the respective wards where the participants worked, with prior consent from the ward managers to use either their office or one of the quiet rooms within the ward. As the wards are extremely busy, I found the best times to interview were late afternoon, early evening, and at night. All interviews followed the shift pattern of the participants, regardless of the shift. On a few occasions, we had to reschedule some of the interviews due to shifts being changed, or due to the acuity of the ward, or my own shift pattern changing.

The focus groups had a conference room booked for X number of dates and the best times to use this room without being disturbed was late evening. The reasoning behind this was twofold: firstly, to accommodate the independent note taker who was present during each focus group; and secondly for the ease of the participants, which will be discussed in more detail later in this section.

4.5.5 Management and storage of interview data

All interviews were digitally recorded and saved on a password-protected laptop used by the researcher, which was kept in a locked filing cabinet within a locked room on the study site. None of the participants requested a copy of their voice recording files. I transcribed all the interview voice files, which was a considerable amount of work, as I was not familiar with transcribing; consequently, this took longer than anticipated. My reason for completing this task was to become familiar with the data. Once the transcripts were completed and validated by the participants, the voice files were then deleted, and the transcribed files were saved again under password protection. A covering letter was sent out to the participants with the transcribed interviews, requesting that any alterations needed could be completed using the following options, which were either; to detail the corrections on a separate sheet and hand it back with the original, or alternatively email the corrections that were needed to be made. A small number of corrections were made to the transcripts, in terms of language used rather than its content. In the same covering letter, a timeframe of two weeks to complete this task was stipulated. I also specified that if I had not received their transcript within this time frame, I would assume no corrections were needed. The participants were also informed during this process that up to the time of the transcript being submitted, they would be able to withdraw their consent to participate. None of the participants chose to withdraw their consent.

4.6 Participants

The target population consisted of registered nurses represented by in-patient medical and surgical wards currently working within the NHS Trust; numbers of participants for each phase of the study were as follows:

Phase One – Interviews (n=10)

Phase Two – Simulation exercise (n=20)

Phase Three – Focus Groups (n=16) replication of participants from Phase Two.

4.6.1 Access to potential participants

The research took place within an acute NHS Trust. To gain access to the participants, although permission had been granted from the sponsor (LJMU) and the Trust research and development group (R&D), I was expected to gain informal approval through several stakeholders, namely ward managers, matrons, and the chief nurse.

As a part of my recruitment strategy, I attended several Trust senior nurse meetings to overview the proposed research study and my intentions in terms of the PhD, publications, dissemination of results internally within the Trust, and externally at conferences (see Appendix 4, p 292).

Reflecting on my experience as a clinical research nurse, I used three recruitment strategies to identify potential participants. Firstly, I initiated recruitment through professional contacts of nurses, who possess a great deal of experience in dealing with the deteriorating patient, in line with the selected sampling technique. I personally attended a high number of MET calls during the data collection phase at the Trust. Consequently, my experience in dealing with specific nurses and particular wards, either through repetition of MET calls or wards notorious for having an increased patient acuity, was ample. My second strategy included distribution of flyers to each in-patient medical and surgical ward, to directly promote the research and to highlight its purpose and entry criteria. Finally, I delivered a short presentation on each of those wards, rotating between the three shift patterns to ensure the delivery to the cross-sectional audience. The presentation detailed the background of the study plus the aims and objectives, and more importantly my rationale for initiating this research project. The latter strategy was identified as being more effective than the remaining two.

The following inclusion and exclusion criteria were used to aid selection to avoid / reduce selection bias (Smith and Noble, 2014). The exclusion of deliberate education in this field i.e., ILS, ALS, ALERT, was based upon a number of factors. Firstly, the poor uptake of this level of training for ward nurses was informed through discussions with the Trust's resuscitation training team . Secondly, if enrolment were permitted to those with this level of training, this would have disadvantaged those who had not completed this training, which would have led to non-compliance of the sampling method used within the study. Thirdly, this exclusion would heighten the experiential learning which is well documented within the literature as the fundamental source of insight within this field of inquiry, which complies with the chosen methodology, and the epistemological position for this study. Finally, I wanted to explore the nature of this reality with a wide-ranging lens, without narrowing the focus by deliberate education as this has been previously acknowledged to improve this level of practice, which potentially may have altered the authenticity of the results. Consequently, all nurses working within a level 2/3 area of care were excluded due to the staff/patient ratio, specialist equipment, and education to monitor the deteriorating patient, plus the presence of senior medical

team based on these units. I felt this would not reflect the reality of the generic ward environment, and this would place those in an advantageous position over ward nurses recruited into the study. The development of this criterion was validated by the host Trust (R&D) department.

4.6.2 Inclusion Criteria:

- Registered general nurses with at least six months post-registration experience.
- Registered general nurses with experience in dealing with the deteriorating patient, with a minimum of three patient experiences, to ensure even exposure for all participants.
- Registered general nurses who can recall a retrospective or prospective account of caring for a patient with deteriorating health.

4.6.3 Exclusion Criteria:

- Non-registered nurses were excluded, as this would have been difficult to gauge in terms of the knowledge base.
- Nurses currently working within Level 2/3 care which included:
  Accident and Emergency Department (AED)

  Intensive Care Unit (ITU)

  Coronary Care Unit (CCU)

  Heart Emergency Centre (HEC)

  Medical Assessment Unit (MAU)

  Surgical Assessment Unit (SAU)

  Most of these nurses working within Level 2/3 area, as detailed above, have the added advantage of attending the courses listed below; this was confirmed after contacting the Matrons of the individual departments.

- Any nurse who had recently attended the following courses i.e., < 6 months prior to admission to the study: ALERT (Acute Life-Threatening Events – Recognition and Treatment), ILS – (Intermediate Life Support), ALS – (Advanced Life Support), all courses detailed recognition and response skills.

Total Number of Interest within the study (n=19)	Total Number of participants recruited (n=10)	Total Number of participants excluded (n=9)
Medical Wards n= 10	n= 6	n= 4
Surgical Wards n= 9	n= 4	n= 5

Table 13: Phase One: recruitment and exclusion numbers.

Total Number of Interest within the study (n=26)	Total Number of participants recruited (n=20)	Total Number of participants excluded (n=6)
Medical Wards n= 15	n= 12	n= 3
Surgical Wards n= 11	n= 8	n= 3

Table 14: Phase Two: recruitment and exclusion numbers.

Total Number of Interest within the study (n=20)	Total Number of participants recruited (n=16)	Total Number of participants lost to Follow –up (n=4)
Medical Wards n= 12	n= 9	n= 3
Surgical Wards n= 8	n= 7	n= 1

Table15: Phase Three: recruitment and lost follow-up numbers.

The reasons for exclusion from the study were mainly due to the fixed criteria (n=15 in total), which comprised of the following: (n=4) newly qualified nurses who had attended recent study days i.e., ALERT course (n=4), nurses currently working within a Level 2/3 area (n=4), nurses with no or little experience in dealing with a deteriorating patient (n=3), nurses who had completed the ILS training < 6 months prior to the study commencing.

In Phase Three, a total of n=4 out of the original n=20 who completed the simulation exercise, were lost to follow-up. This was owing to a variety of reasons such as: no reply to invitation request (n=2), lost interest in the continuing to the next level of the study (n=1) and left the Trust (n=1).

4.6.4 Sampling methods

In qualitative research, an adequate sample size is often hard to predict, and it is based on saturation or data sufficiency which is achieved with a rich sense of knowing the participants' experiences (Sandelowski, 1993; Ploeg, 1999). Data saturation is the conceptual yardstick used by many qualitative researchers over the past two decades for estimating sample size, Guest et al., (2020). Braun and Clarke, (2021) suggest data saturation is reached through interpretation of, not excavated from, data, and therefore, judgments on the number of data items to include, are subjective and cannot be determined. As noted within the literature sufficiency of the sample size is poorly substantiated by researchers, despite the conceptual developments within this area Vasileieou et al., (2018). Characterisations of sample size sufficiency have been measured as "small," "sufficient" and "large," the larger becoming more problematic than desirable. There are an array of tools developed within this area to assist the researcher, however, the validity and reliability of these tools remain under evaluation, many authors in this field are encouraging more transparency surrounding this estimated sample size debate (Vasileiou et al.,2018; Braun and Clarke, 2016). Tran et al., (2017) suggest, data saturation is a difficult endeavour, relying upon what information the researcher has found. According to Hennink et al., (2016) the stopping point for an inductive study is determined by the judgement of the researcher , or when they have reached data sufficiency, this notion was supported by (Namey et al.,2016; Guest et al.,2020). Within this study, there was a mixture of data saturation, with no new insights coming forth, and data sufficiency was clear during the thematic analysis. Therefore, the richness and the volume of the data, plus the non-production of new insights justified the sufficiency and saturation of the sample size in both Phase One and Two, Phase Three was the same sample as in Phase Two. The dataset was immense, adding more data would be repetitive and some of this data would have become redundant. In addition to this I would argue that the ethical consideration of recruiting participants on the strength of building numbers, could potentially place the participants at risk without a substantial rationale for this.

According to Thorne, (2008, p. 94) ID methods are conducted on samples of almost any size, allowing small and larger numbers in inquiry work, which is an approach supported by Ploeg (1999). However, Thorne (2008) warned researchers to be guided by the notion that the larger sample would not necessarily add depth to the data collection; therefore, it is important to generate a rationale consistent with the research question.

Thorne (2008) recommended using a framework for projecting sample size that includes the knowledge of what is needed, closeness to the data, and maintaining respect for the participant.

I selected a purposeful sampling technique. This term is used to describe the recruitment of specific individuals based upon their experience and skill set that would help provide rich understanding of the phenomena, compatible to the selected methodology (Rubin and Rubin, 1995; Patton, 1990; Thorne, 2008). This sampling technique would allow me to select my target audience, who were ward-based nurses with experience in dealing with patient deterioration. The rational for their selection was owing to the reported literature in this field of inquiry, which highlighted the lack of recognition, knowledge, and response of ward-based nurses to patient deterioration (Cioffi, 2000; Quirke et al., 2011). This research presented an opportunity to validate and explore this claim in more detail.

4.7 Design: A generic qualitative approach

The definition of a generic methodology is when the research is not guided by an established set of philosophical assumptions such as ethnography, grounded theory, and phenomenology (Caelli et al., 2003; Silverman, 2000; Thorne et al., 1997). This study investigates nurses' reports of their subjective opinions when caring for the deteriorating patient, by exploring their attitudes and beliefs through their own reflected experiences. Therefore, a more generic approach seemed the best way forward, to allow the research to flourish without the restrictions that may have been imposed by the more traditional methodologies, such as those mentioned (Caelli et al., 2003).

4.7.1 Data collection methods

Data collection methods needed to be compatible with the philosophical assumptions of the paradigm and the methodological framework used within the study. I selected in-depth interviewing and focus groups consistent with both the ID and the naturalistic constructivist approach, all of which will be discussed further in this section (Thorne et al., 2004; Lincoln and Guba, 1985). Data collection for all three phases took place over a 42-month period, sporadically from March 2016 until August 2019. This was due to a variety of reasons, namely the illness of the researcher and further ethical approval needed for the latter part of the data collection process, the focus groups.

4.7.2 Theoretical sensitivity

Theoretical sensitivity is concerned with how the researcher is attuned to the complexities of the participants' world, and how it influences the researcher (Mills et al., 2006). As mentioned, I work within this area of inquiry, unlike other researchers; stepping into this world, my issues were quite different. In some respects, being this close to the data is exciting, and sometimes disappointing, owing to the fact it is difficult for me to "fly" above the data, therefore difficult to resist developing my own abstract concepts, thoughts, and visions of where the data was taking me. My own inexperience in undertaking a qualitative study at this level may have influenced this. What is interesting, as discussed by Bowers and Schazman (2009), is that novice researchers in particular view their data through their own discipline initially: an example they gave was that of psychologists who will see psychology constructs within the data, rather than the data itself. I have recognised this potential issue and placed verification strategies within the study to minimise or manage these actions, as discussed later within this section.

There is a role for both the perspective of the researcher and the informant, which is achieved by being reflexive, which prevents assumptions from being received as newly discovered truths, according to Bowers and Schatzman (2009). A method suggested by Glaser (1978), is "***tabule rasae***" or clean slates, suggesting that when entering the field, the researcher should ensure they are not influenced by any prior hypothesis, theory, or biases, as he argued this enhances the researcher's ability to immerse themselves within the data. As I am conducting an inductive ID study, the latter is neither not possible nor desirable, since my aim was to co-create the construction of this experience with the participants, being aware of the possibility of introducing my own bias. Therefore, I would embrace my own experiences and shared knowledge, rather than to silence them, treading cautiously and being mindful as to not solely create my own construction of the phenomenon. Despite this, these seminal authors in grounded theory suggested that the foundation for generating a theory stem from the insights of the researcher and they argued we engage with analysis daily, through mundane problems that occur naturally (Glaser and Strauss, 1967; Schatzman, 1991).

4.7.3 Phase One – Interviews (Participants 1-10)

In-depth interviewing is a commonly used method of data collection within qualitative research. They allow for a researcher to acquire a range of perspectives of the phenomenon, exploring feelings, beliefs, attitudes, and making something explicit out of something that may have previously been implicit (Gray, 2004). According to Darlington and Scott (2002) people are experts in their own experiences, and particularly relevant to this area of inquiry, whereas nurses do not routinely verbalise their thoughts as they practice. The authors elaborated that the face-to-face mechanism of interviewing creates a flexible approach in allowing both parties to explore the meanings of the questions and answers. The subjective nature of interviews and the construction of knowledge are consistent with the paradigm and methodology chosen for gathering this data (Hunt, 2009; Thorne et al., 2016). In ID research, singular in-depth interviews and focus group discussions are best served by this methodology, to gather narratives of the experiences. In addition, according to Thorne et al., (2016, p. 453) "they are a vehicle to develop a conversational relationship of the shared experience".

There are various ways of conducting interviews, namely structured, semi-structured, and unstructured. In ID interviews, a semi-structured approach is preferable to encourage the researcher to follow opportunities with a deep dive towards enriching the data (Robson, 2002; Thorne et al., 2004). Some authors refer to the interview process as a mere conversation (Schatzman and Strauss, 1973), advocating not to formally end the interview completely, thus inviting the researcher to return to the participant if needed. I chose a semi-structured format as this provided breadth, depth, and richness of the data, whilst allowing the participants the freedom to respond and narrate their experiences without being anchored to a specific format of structured questions (Schatzman and Strauss, 1973).

As the starting point of this research (Phase One), I conducted face-to-face interviews using a semi-structured approach over a three-month period. A predetermined interview protocol consisting of five questions was developed especially for this phase, which can be viewed in (Appendix 5, p 293). The questions were derived from a validated questionnaire used within a similar research study, although they were modified for use within this study with the permission of the author (McDonnell, 2013). Although the sampling strategy used was purposeful, it was crucial at this point that the participants all had a comparable understanding of a definition of patient

deterioration, which could then be consistently applied throughout all phases of the study. The following definition was employed to serve this purpose and selected due to its current and widely used status within the literature, as mentioned in previous chapters:

> *A patient who moves from one clinical state to a worse clinical state which increases their individual risk of morbidity, including organ dysfunction, protracted hospital stay, disability, or death (Jones et al., 2013, p. 1,030).*

Data saturation was achieved with the 10th participant, as no further new insights were generated; therefore, this confirmed the saturation point as suggested by Fusch and Ness, (2015, p. 1,409).

All the interviews were held in the ward office, slightly away from the actual clinical area, but still within the ward environment. As the participants were currently on duty, they informed their colleagues of the interview and signposted them to the ward office if assistance was required in an emergency. The office remained unlocked; a sign was placed on the door informing people of an interview in progress. All interviews were digitally recorded as agreed by each participant. Before the interview commenced, I expressed my appreciation in terms of them taking part in the study and advised that the outcome of the interview could be formally recorded as professional development. At the start of each interview, I reviewed their consent, then reiterated the main aims of the study, its purpose, the dissemination of knowledge, the purpose of the recording, and the fact that I would also be taking notes during the interview, as a safety net in case of technical failure.

During the interviews, there were two interruptions; the digital recorder had to be stopped whilst the participant dealt with a minor situation on the ward – the interruption was less than five minutes on each occasion, before recommencing. Schatzman and Strauss (1973) advocated for a lengthy interview to create a flowing conversation, to probe for detail, clarity, and explanation. The timing of each interview ranged between 40 and 70 minutes. The average timing was approximately 50 minutes, I became mindful of the possible constraints of the interview process, which involved the participant needing to return to the ward if necessary whilst being interviewed, and therefore mindful the ward was short of a trained nurse with no other staff to cover for him/her. I considered how this situation might have influenced the quality of the data.

I developed a contingency plan in case this became more of an issue than anticipated. I had provisionally agreed with the Trust to use one of the closed wards, an office that was currently used by administrative staff, however, this never came to fruition (Darlington and Scott, 2002).

We agreed on a mutual time to meet in the ward. If there was high patient activity in the ward, the interview would be rescheduled. This occurred on three occasions within the division of medicine, which is more likely to occur than in surgery, as most surgical patients are fit and well before being admitted for elective surgery. This is not the case in medicine, and certainly not the case in emergency surgery or with post-operative patients, as these groups of patients have the potential to deteriorate in health.

Throughout the interview, I focussed on how the nurses cared for the deteriorating patient, how they recognised the unfolding emergency, what their feelings were at that time and how they managed the situation. From the outset, the interviews yielded rich data, which I used to compare after each interview. This guided some additional questioning in subsequent interviews. I tried my best to ensure that they used language familiar to themselves, not translating words for my understanding, to avoid translation competence as described by Flick (1998). Although some of the issues I faced were the use of local dialect, all interviewees where from the local area, some with strong local accents, therefore, I had some difficulty in understanding certain phrases and language used. When this occurred, I asked for clarification before moving on with the interview. My questions were aligned to the predetermined ones (Appendix 6) as a guide for discussion, ensuring that the questions would be revisited for more depth if needed, referring to similar situations, and trying to establish their confidence to develop the rapport with the participants needed to elicit the data (Darlington and Scott, 2002). I felt there needed to be a high level of trust for them to feel comfortable in sharing their thoughts with me, especially in relation to the area of inquiry. I conveyed to all the participants prior to commencing the interview that I was not there to judge their actions, thoughts. I noted some authors (Gray, 2004; Schatzman and Strauss, 1973) have encouraged the need for an interview checklist, to act like a code of conduct. I found this to be prescriptive and restrictive, in the sense that this would narrow the data collection. My aim was to enable the interviewee to speak as freely as possible, in their own terms about their experiences and interactions. On several occasions, the interviewees derailed their focus and began to touch upon other topics not pertinent to the questions or not relevant to the subject of discussion. As the interviewer, I gently

nudged them back on track by asking for a deeper insight into the previous question, which appeared to work well. All interviews were recorded digitally and transcribed verbatim, then compared to the note taking soon after each interview, in keeping with the methodology. In doing so, this highlighted some of the developing codes and themes before analysis. Each participant was asked to date and sign an informed consent sheet and they were all given a participant information sheet explaining their participation prior to entry into the study to comply with the ethical approval.

4.7.4 Phase Two – Simulation exercise (Participants 11-30)

Simulation training is not a new concept and is increasingly becoming a vital component of medical and nursing education. However, the number of studies demonstrating efficacy in the management of the deteriorating patient including trained nurses is sparse. The literature is associated with student nurses and the acquisition of new skills (Witt et al., 2010; Cooper et al., 2016, 2020). Therefore, my rationale for using a simulation exercise was to gain insight into the participants' assessment of the deteriorating patient by observing their recognition and response skills within the simulation.

I invited the participants from Phase One to a few small group meetings when available, to discuss the possibility of constructing a simulation exercise based on a real-life medical emergency call, which appealed to the participants. During these meetings we had the opportunity to revisit "what intuition is," as the participants were eager to learn some of the results. This was described in many ambiguous forms, portraying aspects of their practice relating to the recognition of, and response to patient deterioration. Therefore, to aid their understanding we discussed the following definition of intuition, selected for its simplicity, and emphasis on the multidimensional aspects of this concept. The participants' felt this discussion was helpful for their future learning as they were to exit the study at this point:

> *Intuition is a multidimensional concept, involving cognition, emotions, physical and spiritual beliefs, thus, giving rise to its complexity* (Smith et al., 2004, p. 617).

A one-to-one semi structured approach using a desktop exercise was deemed more favourable as this was perceived as less challenging. This would encourage the participant to talk freely through the stages of the simulation without judgement. The

simulation as mentioned was based on a real-life MET call selected from my own reflective practice (See Box 1, p 118). The questions asked at each stage were formulated around the themes identified in Phase One, developed in conjunction with the participants, and empirically supported by research from Minick and Harvey (2003), Gazarian et al., (2010), Ludikhuize et al., (2012), and Stubbing et al., (2014), for example, question one: What are your thoughts of this situation? This question was to elicit their recognition process such as knowing the patient, intuition, experiential knowledge, and confidence in their ability. In addition, question five: Who would you contact for help? and why? This was based on their response of collegial relationships and to gauge their confidence/ competence as identified as main and sub themes within Phase One (see Box 2, p 119).

The content and design of the simulation was validated by senior members of the medical and nursing team, equally representing medical and surgical domains of practice. They were asked to assess three clinical scenarios in terms of accuracy, validity, and data protection, with the removal of identifiable data. Each of the scenarios were numbered. These numbers were then concealed and placed into a dark velvet bag and mixed. One of the clinicians was asked to randomly select a number and reveal the selected scenario. Neutropenic sepsis was chosen for use within the study. The remaining two scenarios were associated with renal failure and hypovolemic shock. All three clinical scenarios were selected due to their generic nature to transfer within a surgical and medical field of clinical practice.

The proficiency of this simulation was tested through a mock exercise recruiting four nurses who work at the host Trust to participate. Through this feedback, I modified the simulation to streamline the flow; each part of the exercise was revealed to the participant as a staggered approach by means of an A4 PowerPoint template, typed in bold to aid clarity as the stages were reached.

Box 1: Simulation Exercise

A 33-year-old male admitted via Accident and Emergency Department (AED) feeling unwell and presenting with a fever of 38.8. He is currently receiving chemotherapy for Non-Hodgkin's Lymphoma (NHL); the last chemotherapy was given over ten days ago. He has been brought in from home after being unwell for a couple of days and states he remains worse rather than better. Whilst in AED, he has been given paracetamol to settle his temperature, bloods as well as blood cultures have been taken, and he has received the first line antibiotic therapy. The bloods have not been reviewed at this time. His wife informs us he is normally very chatty but seems very distant and withdrawn.

Stage One

Observations on admission to the ward 14.00 hrs

- Temp 36.6
- Pulse 120
- BP 130/80
- Resp. 20
- EWS Score = 2

Stage Two 18.05 hrs EWS = 2 Pulse 130

Stage Three 21.00 hrs EWS = 3 Pulse 160

Stage Four 22.15 hrs EWS = 9

Stage Five 22.18 hrs MET team arrive, placing resuscitative measures.

The simulation consisted of five phases (see Box 1 and Appendix 1, p 277 for a more detailed view). For each phase, the participants were asked to observe and interpret the physiological parameters of the patient as the scenario unfolded. The themes identified in Phase One were transferred into Phase Two as the participants elaborated on the difficulties, they would face in both the recognition and response process, such as the use of intuition, EWS score being low not triggering the activation response, difficulty in packaging the deterioration to the medical staff etc.

The questions asked (see Box 2) at stages 1-4 were to help stimulate the thought process of the participant as a cyclical process. Stage 5 came complete with its own four

questions to specifically probe into the situation awareness; following this, the participant would be given feedback of the scenario to enhance their understanding of the simulation.

Box 2: Simulation exercise questions used in Phase 2

- What are your thoughts of this situation?
- What is your overall impression of Mr X's condition?
- Do you have any concerns in relation to his current EWS score?
- If so, what are those concerns?
- Who would you contact for help? and why?
- Explain how you reached this conclusion?

4.7.5 Phase Three – Focus groups (Participants 31-46)

Focus groups are a popular method of data collection in nursing research and a well-established method whereby a group jointly constructs meaning about a topic (Kitzinger, 1994; Krueger and Casey, 2000). The definition of a focus group is a research technique that collects data obtained through group interaction on a topic influenced by the researcher (Morgan, 1996). Several authors have identified three main components of focus group research (Kitzinger, 1994; Krueger and Casey, 2000) which are as follows: (A) A method devoted to data collection, (B) interaction as a source of data, and (C) the active role of the researcher in the creation of the discussion group.

4.7.6 Design of the Focus Group

The literature suggests the group of participants selected should be homogeneous in terms of their experience of the phenomena central to the inquiry. In doing so, this avoids potential power issues within the group and promotes comfort and a safe environment in which the participants can disclose information (Morgan and Krueger, 1998; Carey, 1994). Some authors would recommend that the homogeneity in focus groups should extend to age, status, class, occupation, and other characteristics, as this will have an influence on the interaction of different people (Krueger and Casey, 2000), whereas other authors reject this position and prefer to recruit heterogeneous groups, as this explores different views of the phenomena being investigated (Macintosh and Sandall, 2010; Powell et al., 1996).

The nature and size of the group depends on the availability of both the participants and the researcher, accessibility of the facilities and the resources needed to facilitate the group discussion (Morgan and Krueger, 1998). The naturalistic approach allows the researcher to select participants for their suitability for the study, using either convenience or purposeful sampling methods, and recognises that focus groups are not representative of the population selected but merely a snapshot. The size of each group is dependent on the research purpose. The importance is to ensure the group is large enough to generate a meaningful discussion, as opposed to too many, which creates a barrier in which some members are prevented from sharing their insights and thoughts (Clarke, 2006; Holloway and Fulbrook, 2001).

Some authors (Krueger and Casey, 2000; McLafferty, 2004) recommend a number of participants between 4-12, with the optimal size being between 5 and 10. However, it has been debated for some time that smaller scale groups are more effective for complex issues of inquiry (Morgan, 1997). Many authors have reached consensus that between 4-6 focus groups are needed to generate adequate data (Krueger and Casey, 2000; Holloway and Fulbrook, 2001). The justification for this range is due to possible early saturation of the data, in which further focus groups will not be necessary (Beyna, 2000; Krueger and Casey, 2000).

4.7.7 Rationale for selection of Focus Group methodology

Focus groups are an established method of data collection within the development of ID research. My intention was to gain further information about the experiences of this group of participants, to develop further theoretical insights collectively (Thorne et al., 2016). Focus groups allow for a range of opinions to be discussed. Group members are encouraged to listen and respond to the ideas and comments of others. The focus groups offered a privileged insight into the participants' world due to this open discussion. The participants were already recruited within the study (Phase Two); it was, therefore, consistent with the literature concerning the development of the focus group, as all participants completed the simulation exercise and had knowledge of patient deterioration (Krueger and Casey, 2000; Krueger 2000). I considered the fact that some participants knew each other within the individual groups, and the power imbalance between the researcher and participants was reduced as they held information that the researcher was seeking (Young, 2011). According to Clarke, (2006, p. 21) and Holloway and Fulbrook, (200, p. 547), focus groups are not as formidable as individual in-depth interviews. However, this approach yielded more data and

confirmed some views, both individually to the participants and collectively, in terms of peer reviewing their own thought processes, which was fascinating to observe.

The groups consisted of four participants each and we had a total of four groups (see Table 16, p 122). In relation to the size, the allocation was based upon the number of participants available and distributed to enable a mixture of all genders and therapy areas where possible (Morgan and Krueger, 1998). On one occasion the group meeting was cancelled due to low numbers and then rescheduled. This issue was proactively managed for the remaining group meetings, as the participants were asked to text the researcher to verify their attendance. The small numbers in each group provided a comfortable experience for the participants to join; coupled with some members knowing each other, this was effective on the data collection process, as the participants spoke candidly about their experiences, as portrayed within the literature (Krueger and Casey, 2000). The groups offered an opportunity for those participants to compare their own experience to that of their colleagues from a different therapy area. This helped to portray the consistency and commonality of the issues identified, which gave the participants more confidence in their own insightful thoughts in practice, as mentioned by the participants during this data collection exercise.

Focus Group	Characteristics
Group A	Medical = 3 Surgical = 1 Male = 1 Female = 3
Group B	Medical = 2 Surgical = 2 Male = 1 Female = 3
Group C	Medical = 2 Surgical = 2 Male = 1 Female = 3
Group D	Medical = 2 Surgical = 2

	Male = 0 Female = 4
Male = 3 Female = 13 Total = 16 Medical wards = 9 Surgical wards = 7	

Table 16: Focus Group allocation and characteristics

4.7.8 Focus group development

Once the ethical submission was approved for this Phase, I began the process of developing the groups; I corresponded with all the participants via Trust email, to apologise for the delay within this development and enquired about their availability and their consent to continue. It was at this stage that I realised that several the participants were lost to the follow-up, as some decided not to continue within this phase of the study. As imagined, there was a great deal of correspondence needed to organise these groups, in terms of dates, timing, and a venue to suit all. Firstly, the venue was a designated meetings room within the host Trust, which was blocked with dates that suited everyone; a consensus was reached in relation to the timing to suit all parties involved. The meeting room was large enough not to be intrusive on the participants' personal space and it was consistently available after hours, from 17.00 – 21.00 hours. The room was arranged to create a more relaxed atmosphere, with the participants and myself sitting around a sizable table.

In keeping with focus group methodology, an independent note-taker was present to ensure accurate recording of critical data, which I might have overlooked during the discussions. The sessions were also audiotaped (Ritchie and Lewis, 2006; Bryman, 2008; Franz, 2011). I started each group session by introducing the independent note-taker, who was known to the group as a senior clinical nurse within the host Trust. The participants then had a chance to introduce themselves, giving a brief history of their background. My initial thoughts when conducting these groups was to avoid long pauses between conversations, ensuring the momentum of the conversation, which was perceived as my role as highlighted in the literature concerning focus group development (Kitzinger, 1994; Krueger and Casey, 2000). I gave a brief PowerPoint presentation of the explanatory themes and my theoretical explanations built from the current data as information of interest to them, as they had participated in phase two of this study. Due to the long intervals during this data collection stage, for reasons beyond my control, decided to overview the stages of the clinical scenario as a topic guide to steer the focus of the discussion and refresh the memories of the participants, to prompt another wave of reflection. The questions (see Box 3) on each slide prompted

discussion and encouraged the participants to expand on their thoughts, which helped clarify and crystallise my thinking further. The discussions took the form of a peer review exercise, with the participants narrating their own experiences, clarifying, and justifying their actions in the given situations. They had similarities to share collectively in both the recognition process and the response, relating to the themes generated in Phase One and Two. It was interesting to hear the common themes flow through the group discussions, such as difficulties faced when attempting to escalate the care of the patient, when utilising their intuitive experience, and knowledge of similar situations. The sessions all ran over the allocated time due to discussions generated, with an average time of 80 minutes each session. The data yielded from the focus groups were rich and invaluable in developing an understanding of this clinical phenomenon.

Box 3: Focus group questions

- How did you find the simulation exercise?
- Is there anything you would like to discuss within this focus group based on your experience of the simulation, and or the patient deterioration?
- Did you feel confident completing each stage of the simulation?
- Could you describe if any, frustrations, or anxieties you may, or may not have in relation to completing the simulation exercise?
- Do you feel this was a useful exercise and relevant to your level of learning?

4.8 Data Analysis

Within this section, I will explain the process of coding and the thematic analysis of the data. I chose the work of Braun and Clarke (2006) to assist with the data analysis, using their six phases of thematic analysis (Table 17) as a framework for conducting a more rigorous, theoretically flexible method of analysing the data gathered within all three phases of this study.

Phase	Description of the process
1. Familiarisation of the data	Transcribing the data – reading and re-reading, noting down ideas.
2. Generating initial codes	Coding interesting features of the data.
3. Searching for themes	Collating codes into potential themes.
4. Reviewing themes	Generating a thematic map.
5. Defining and naming themes	Generating clear definitions or names for each theme.
6. Producing the report	Producing a scholarly report of the findings.

Table 17: Phases of thematic analysis adapted from Braun and Clarke (2006)

4.8.1 Coding of the data

Coding of qualitative data is defined as; identifying concepts and finding relationships between them, a way of indexing the text to establish a thematic idea of the data (Saldana, 2016). A code is often a word or a short phrase that symbolically assigns language, based on visual data (Saldana, 2016). This stage occurs before or sometimes at the same time of the thematic analysis, to elicit those threads within the data which will then be theoretically linked to the research question / questions to make sense of the data. The need for coding, according to Creswell (2014), is simple; text data is dense data, and it takes a long time to sieve through it, therefore coding is a good way of doing this.

The frequency of the codes, as they appear in the text, is viewed as significant within the data. Counting is easy; thinking is hard (Saldana, 2016, p. 41). Some qualitative researchers are against the principle of counting codes, as this conveys similarities to quantitative methodology, contrary to qualitative research (Creswell, 2013, p. 185). Some codes generated within my own data ranked higher in numbers compared to others, for example "observations" linking the code to the importance of a descriptive method of recognition of deterioration, which developed into the theme of EWS. Moreover, counting the codes may provide some insights into the importance of such a code, as it did in my case. However, the frequency of occurrence may not necessarily be an indicator of significance (Saldana, 2016, p. 41), but how widespread it is within

the data might be more significant. I have purposefully reported the coding stage and the thematic stage as singular entities to enhance the readers' awareness of the detail of both. They were generated simultaneously.

4.8.2 The Coding stage

The process of coding my data started with Phase One, transcribing the interviews verbatim, as soon as possible post-interview. Listening to the interview recording, transcribing and then at a later stage repeating this process enabled me to become familiar with and immersed within the data. This process was then applied to the remaining phases within this study to generate codes which then became the themes, in most instances. The transcript was handwritten initially to allow for mistakes to be deleted instantly before moving on. The written information was then typed into a Microsoft Word document for ease of reading and electronic transferability to the participants. The completed transcript was then printed to enable a comparison with the audio-recording, for a final time, to check the accuracy, becoming increasingly straightforward. The transcripts were read at least three times before coding commenced; a high standard of transcription accuracy was established through this cyclical process. During this time, the data analysis had already commenced cognitively through the data collection stage, listening, and then reading the transcribed outcome of the data (Graneheim & Lundman, 2004; Percy, 2015).

During the initial coding stage, data were analysed line by line and coded using a word or phrase association to capture what was happening, then the data were labelled to define the repetitive words in the text. This was written in the margin on the hard copy of the transcript, using the cyclical reading and re-reading process of the text (Saldaña, 2016; Birks and Mills, 2011). The codes were generated from a mixture of the researcher's vocabulary and local dialect language used by the participants to label what was happening in the data. In vivo codes were generated verbatim from the participants' responses (Charmaz, 2006; Birks and Mills, 2011). He is "***going off***" is one example of an *in vivo* code, a term that several participants used to identify the early stages of deterioration, a term used colloquially with significant meaning for the participants in this study. These types of codes helped to anchor the analysis firmly in the participants' world (Charmaz, 2006).

Coding of the data is important to ensure accuracy; I found that as data were being coded, the thematic patterns emerged. I decided to use a basic form of coding, as systems such as NVivo can limit your options in marking up a text, according to

Silverman (2011). I attended further training in NVivo and attempted to apply this method to assist with the data management. This generated more work than was deemed necessary, and I felt distant from the data to the point that it became artificial. I turned to the method of colour coding as this created a visual display of the codes; this was instrumental in identifying the overall codes in the written text before moving forward. The colour coding provided basic, pragmatic use of displaying information visually, which is useful when dealing with a large set of data (Smallman and Boynton, 1993). As a novice researcher, this gave me guidance to complete the task. An example of the coding directly from the transcribed text can be viewed in (Appendix 6, p 294).

Data were coded for a wide range of activities, behaviours, emotions, and hierarchies. This system of colour coding worked well, which made the transition to theme development straightforward. The initial stage involved the intricate line-by-line coding, of reading and then re-reading, which enabled the synthesis of large volumes of data into a condensed format. As the coding became a lot more focussed, patterns then started to emerge from the data. The most frequently featured codes were grouped into a theme (see Table 18, below) and labelled, either using the existing code name or through the development of another one (Saldaña, 2016). The remaining codes were clustered together to create other themes that explained other segments of the data. What became apparent early in the coding process was that the codes and themes linked together, and the key concepts to be used in the construction of the final analysis began to construct. Coding the data was not a linear process; it was "iterative and cyclical," as the researcher moved back and forth between different segments of data, comparing new data with old data, line-by-line. With each cycle, the codes and themes became more refined and abstract, providing a conceptual grasp of the data. (Charmaz, 2006, p. 54).

Codes from the data	Theme: NEWS
Observations Vital signs Temperature Tachycardia NEWS Low blood pressure Increased pulse	Interpretation of the physiological parameter system (National Early Warning Score) NEWS / MEWS

Table 18: Example of code linkage and theme development

4.8.3 The Thematic stage

Thematic analysis is a method for reporting identifiable patterns (themes) within data (Boyatzis, 1998). Its purpose is to organise your data into clusters, patterns, and categories, which describe the data in rich detail, thus, depicting the common threads appearing within the data (Miles et al., 2014). Thematic analysis is widely used to analyse qualitative data. However, according to Attride-Stirling (2001) and Tuckett, (2005), there is no consensus as to what it is or how to use this process. Boyatzis, (1998) explained that it could be a poorly defined "branded" method, in the sense that it appears not to be claimed as a method of analysis, but as something else. Braun and Clarke (2006) argued that most "analyses" completed within qualitative research are thematic: if we don't know how researchers analyse their data or how the assumptions have been made, it then becomes difficult for the reader to evaluate the research. Authors within this field repeatedly report that insufficient detail within the data analysis process is often seen within qualitative research (Attride-Stirling, 2001).

As previously mentioned, the framework I used to assist the data analysis process was that of Braun and Clarke (2006) (see Table 17, p124). This is the most influential approach used within social science to conduct thematic analyses. I was inspired by this approach due to its simplicity, with a clear useable step-by-step framework (Divan et al., 2017). It is much more than just summarising data; a good thematic analysis makes sense of the data. A common pitfall to avoid is the use of the interview questions as themes, as this reflects the fact that the data have been summarised not analysed (Braun and Clarke, 2006; Clarke and Braun, 2013). This step-by-step approach was applied to all three phases of the study, to maintain consistency throughout the study

in terms of code and theme development. The next sections will overview the process of theme development using this framework.

4.8.4 Stage One – Familiarisation with the data

I collected the data in all forms within the study and transcribed the data myself. This gave me the opportunity to become familiar with the data, in particular the frequency of occurrence of some of the themes. The transcription of the verbal data into written form appeared very time consuming, labour intensive, and at times frustrating, as I had to stop and rewind the recorder due to frequent colloquial language used, which made the transcription difficult to follow. However, this was a great way to start familiarising myself with the topic and become immersed within the data. I read and then re-read the transcripts over and over, then compared the written transcript with the verbal recording again, as suggested by Riessman (1993).

4.8.5 Stage Two – Generating initial codes.

The process of coding is a part of the analysis; some of the codes identified within the text later transformed into actual themes. An example of this was the phrase "intuition" used by the participants to describe their feelings of recognition and response to patient deterioration, based upon their own intuitive perception. This code shared similarities to phrases used by the participants, such as: "it's a gut feeling, knowing the patient, something not right, instinctive," and so on. All these phrases were marked as codes in the data, and they were then used to assist in the development of the overarching theme of intuition.

4.8.6 Stage Three – Searching for themes

Once the initial stage of coding had been complete, I was left with a list of phrases / words to condense down into overarching themes. In some respects, this process was straightforward. As the relationship between the codes were close, with some, as already mentioned, transformed into a theme. I decided to use a thematic map, as suggested by Braun and Wilkinson (2003), to assist my thinking between the codes and to depict the levels of themes in relation to the overarching main themes and subthemes. The initial thematic map was substantial, with the sets of codes seeming to belong together or at least with strong links to each other. At this stage, I did not want to abandon anything, as warned by Braun and Clarke (2006), without another complete review, which was the next step to take in this approach.

4.8.7 Stage Four – Reviewing the themes

Upon reaching this stage, I had already decided on the possible main themes – this was merely an exercise to refine those themes. I noted that some of the themes could be combined to form a stronger main theme or a subtheme. An example of this is illustrated below in Table 19. I condensed three codes into two themes, then, I condensed this further, creating one subtheme.

Code	Themes	Subtheme
Being responsible Leading by example Accountability	Responsibility Accountability	Leadership

Table 19: Defining codes, themes, and subthemes.

This stage, according to Braun and Clarke (2006), is comprised of two levels of review, the first being refining your themes as above, and then condensing them down from a formidable list into something that is feasible to work with in terms of size. This was done by re-reading the extracts of each theme, and then considering whether they form a consistent pattern through the data. At this stage, I re-thought my strategy regarding the main and subthemes. A small number of themes were not suitably matched to the rest of the data, so I discarded them. Then I took this opportunity to combine and re-name some of the themes and, as demonstrated in Table 18, I created some new names to assist with the description for the reader.

4.8.8 Stage Five – Defining and naming themes.

At this stage, I developed thematic mind maps for all phases of the study (see Figures 4, 5, and 6) by defining and then re-defining the themes and subthemes that I am going to present within the next chapter. As a part of this refinement, I considered the relationship between each of the themes and subthemes, as this offers more structure to the data, as it is interrelated and, more crucially, makes it possible to link it to the aims and objectives of this study (Braun and Clarke, 2006; Clarke and Braun, 2013; Divan, et al., 2017).

4.8.9 Stage Six – Producing the report.

This consisted of having the set of themes for each of the phases and relating them to one another. The analysis will clearly show how all the main themes and subthemes

narrate the experiences of nurses dealing with a wide range of conflicting, yet challenging issues, relating to patient deterioration. The overarching themes and subthemes (Figures 4,5,6 p131-133) represent factors that clearly influence this area of clinical practice. The analysis of this study reveals that within this process there are far-reaching influencing factors, which hinder this concept of early recognition of deterioration. Furthermore, one of the mediums identified within this study that creates this effect is one of the strategies associated with the rescue of this situation, namely the National Early Warning Score. The reader will be given the opportunity to make sense of the data themselves, to assist their own understanding and make their own judgements within the next Chapter.

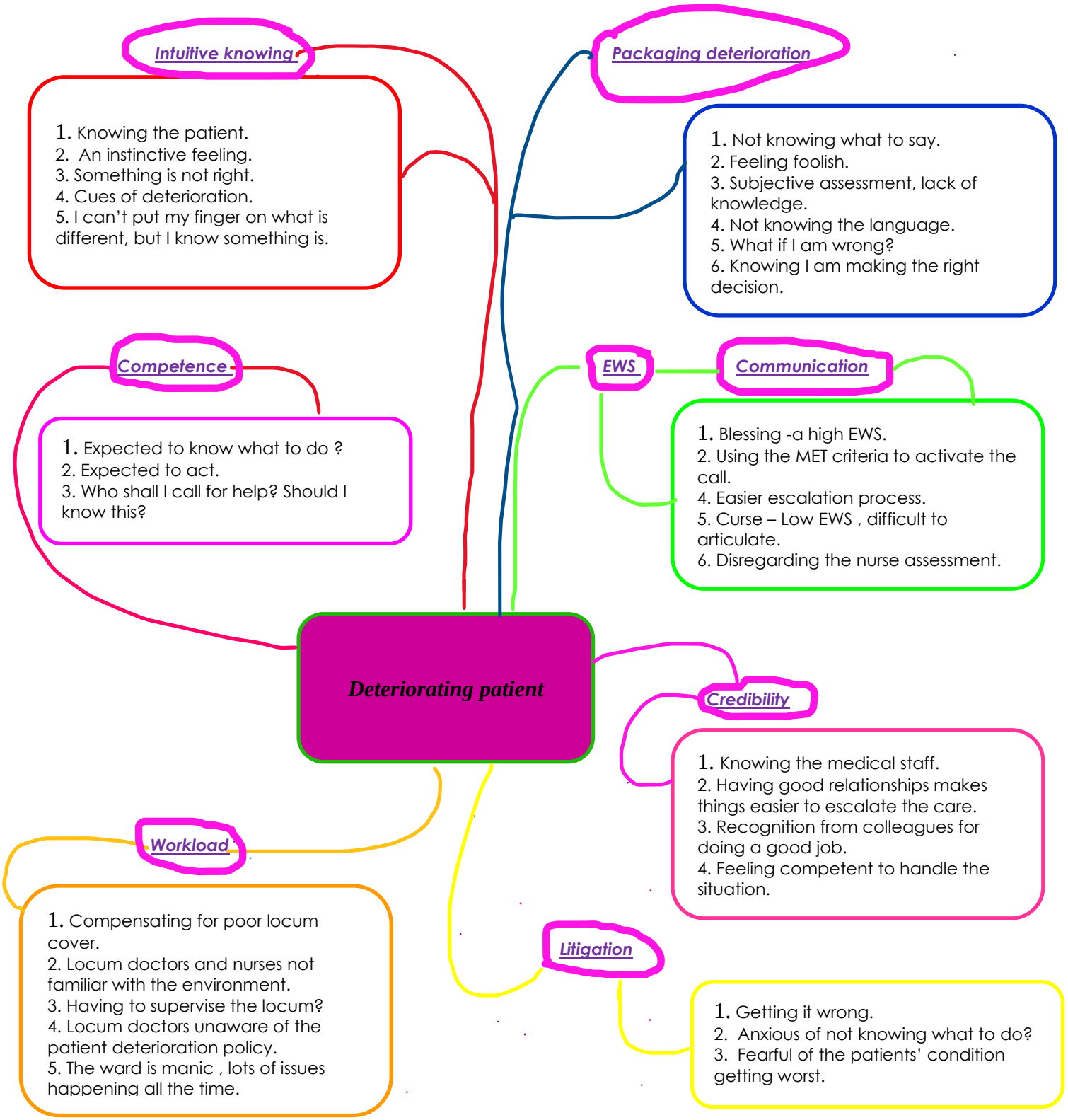

Figure 4: Illustrates the development of a mind map, indicating the constructed themes circled in purple bold, in Phase One.

The content of the narrative boxes derives from the data demonstrating the construction of the theme and the association to patient deterioration, which has been replicated in all three Phases of the study. Wu and Wu (2020) have influenced this concept of mind mapping.

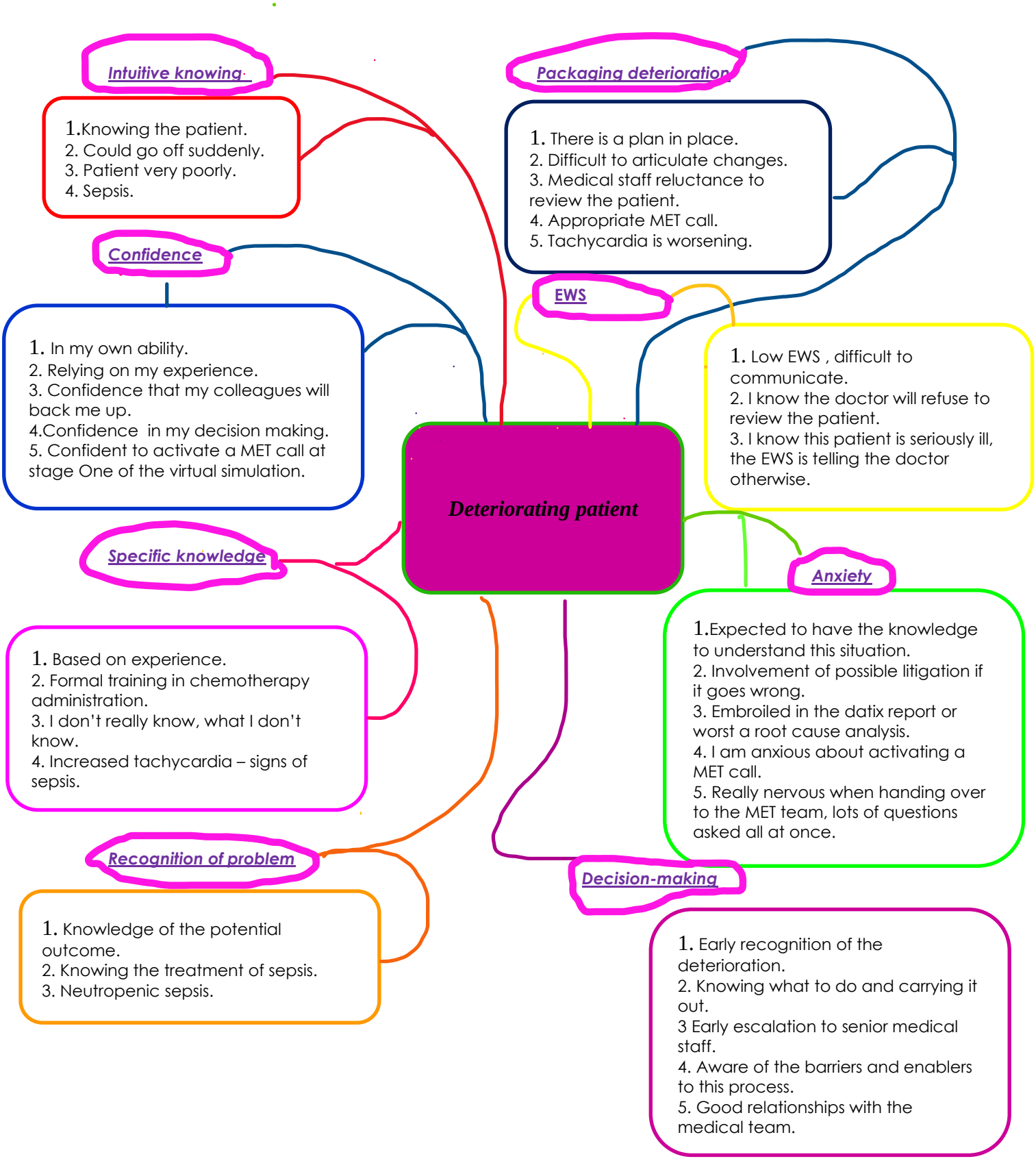

Figure 5: Illustrates the development of a mind map, indicating the constructed themes, circled in purple bold in Phase Two.

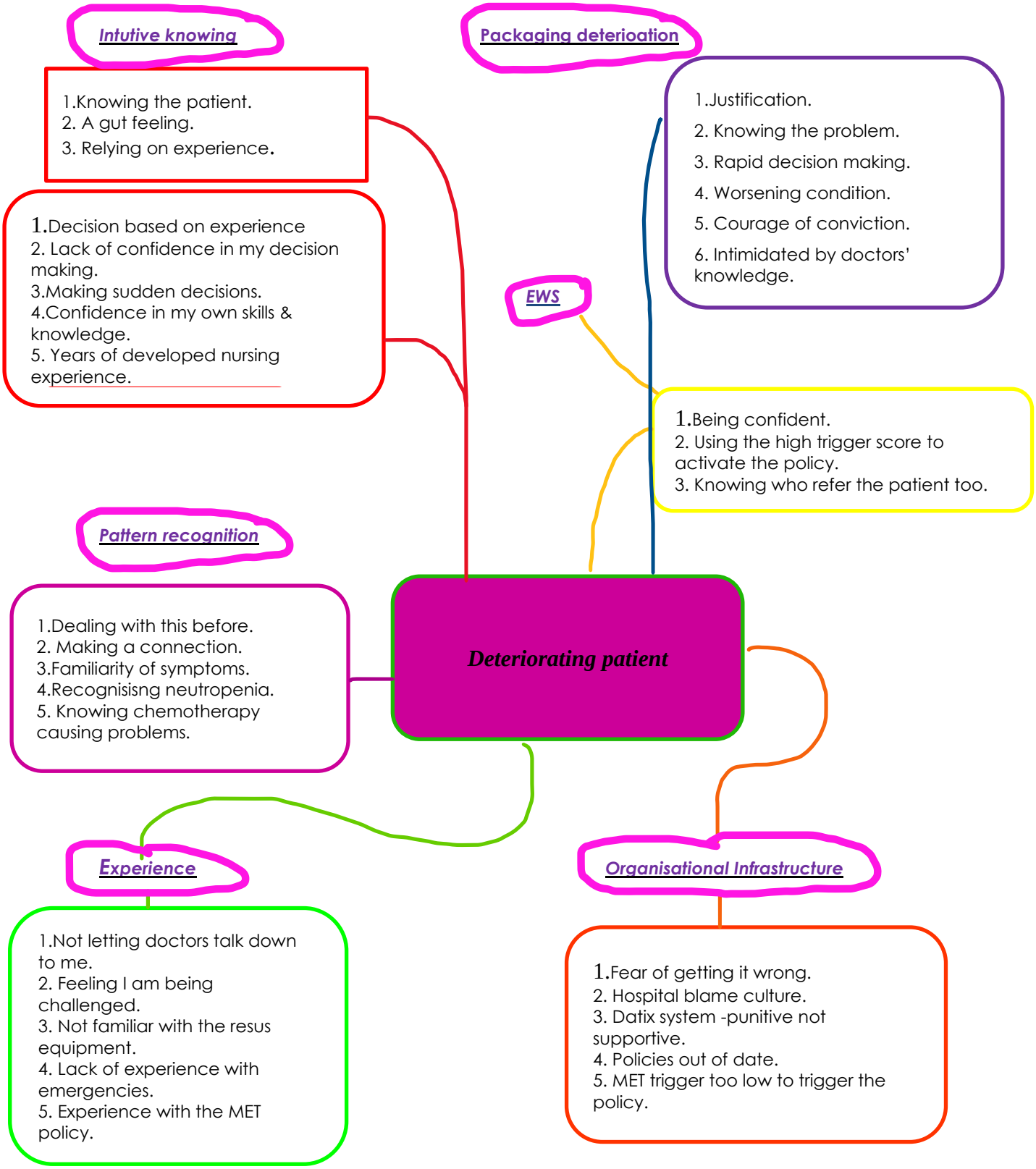

Figure 6: Illustrates the development of the final mind map, indicating the constructed themes circled in purple bold , in Phase Three.

4.9 Trustworthiness

The validity or trustworthiness of the study is often questioned in qualitative research. This is due to the validity and reliability not being measured the same way within the naturalistic inquiry as opposed to positivism. According to Scholes (2012), the validity or trustworthiness should be present in the study findings. Therefore, the trustworthiness of the study relates to whether the findings are worth considering, or if the reader has confidence in them in terms of credibility (Lincoln and Guba, 1985). Furthermore, it is important to demonstrate that the phenomenon under examination has been recorded accurately.

Qualitative researchers have described an evaluation criterion that should be met in any qualitative study. Its purpose is to demonstrate the quality of the project or, more specifically, the levels of validity (Whitmore et al. 2000; Caelli et al., 2003; Thorne, 2008). The main aspects of the latter being distinguishing method and methodology, an explicit approach to rigour, and identifying the researchers' analytic lens (Caelli et al., 2003). To establish my commitment to the trustworthiness of this study, I have applied the following framework, as described by Thorne (2008, pp. 223-226): epistemological integrity, representative credibility, analytical logic, and interpretive authority.

4.9.1 Epistemological integrity

According to Thorne (2008, pp. 223-224), qualitative research should demonstrate a line of defensible reasoning from the assumptions of the nature of knowledge, through to the methodological rules and explanations of the research process. There should be a clear link between the following: epistemology, research question, data collection, interpretation, and strategies that enhance the research outcomes. This study demonstrates a clear link between the selected knowledge base (intuitive and experiential) used by the participants to recognise patient deterioration; in understanding this process in more detail, this has highlighted factors that are influencing this area of practice. There is a well-defined link between the research question, data collection, and interpretive / constructive strategies within this study.

4.9.2 Representative credibility

Thorne (2008) related credibility to the selected sampling methods used within qualitative research. The central issue is that sampling should be aligned to the theoretical perspective and methodological positioning of the study. I have embraced purposeful sampling to ensure all participants have similar levels of experience when dealing with the deteriorating patient, filtered through the inclusion and exclusion criteria of the study. Thematic matching was found in both the research interview data and the available literature; the participants in this study were asked to validate their own interview transcripts. This allowed the interviewer to verify any contradiction or disagreement with the interview process and provided an opportunity to re-open a line of questioning if needed. According to Glaser and Strauss (1967), greater credibility is afforded if maximum variation is achieved before claims of conceptualisation are made.

4.9.3 Analytical logic

There is an expectation that the analytical process is evident in the reporting of all qualitative data, which goes beyond the common stipulation that inductive reasoning is used throughout the research (Miles and Huberman, 1994; Thorne et al., 2004). Qualitative researchers criticise the fact that little in terms of the process is reported in qualitative research (Caelli et al., 2003). During this research, I have maintained my own reflective account of the research process, serving as a starting point to keep track of my activities, which has been disclosed in detail within this chapter. The available literature accepts the need for the reflective account, which could act as an audit trail or a pathway along which another researcher could potentially replicate (Thorne, 2008, pp. 225).

4.9.4 Interpretive authority

This requires the interpretation of the research as trustworthy and that it demonstrates truth beyond the biases of the researcher (Thorne et al., 2004, 2008). In this study, I have incorporated strategies to reduce potential bias as much as possible, due to my own role as both the researcher and a clinician working within the field of the inquiry, which has already been discussed in detail. The intention of my research is to offer a coherent

representation of the phenomenon, as I am aware that over-interpretation can easily be done by the researcher, whereas the data set might not clearly match the interpretation induced by the researcher. The data presented within this study have been verified by the participants, with a legitimate claim on whether the researchers' interpretation of their world represented their account of reality by the fact that they validated their own interview transcripts.

Sandelowski and Barroso (2003) argued that interpretive explanation is the most processed data used in qualitative research methods. They concur that "interpretation" can potentially be removed from the original data captured in real time. Therefore, they suggested that qualitative data should be examined in conjunction to the participants' context and, in relation to this study, this should be instantly recognisable in the context of clinical practice. Interpretive authority, according to Thorne et al., (2004), requires the researcher to check their own construction of knowledge, themes etc. with the participants. I took this advice; the themes developed were conveyed back to the participants to confirm their agreement before moving forward. Benner (1984) explained that interpretation must offer an increased understanding and it must articulate the practices, meanings, and concerns of the world of knowledge it interprets, *"One must not read into the text what is not there" (Benner, 1984, p 111).*

4.9.5 Verification Strategies

As detailed within the text, I employed the use of member checking as one of the verification strategies to reduce the possible researcher / clinician bias, given my role. Once the transcripts were transcribed verbatim, I distributed them to the participants to verify that the finished transcript represented a true reflection of the interview; the completed transcripts were returned to me, signed by the participants, authenticating the content. In addition to this, the same process was repeated to validate the themes and subthemes developed within the analysis. This process is widely used within qualitative research as being an effective validation strategy (Miles and Huberman, 1994; Creswell and Miller, 2000).

The second verification strategy used within this study was the screening of articles to be used within the literature review; this was done to ensure a non-biased selection of the current literature. An independent senior nurse within the host Trust was approached for assistance, who accepted my request. The independent reviewer and

I screened the title and abstracts. Those that met the inclusion criteria, after discussion between me and the independent senior nurse, were included in the review.

Phase Two of the study involved a simulation exercise. This simulation was based upon a real-life MET call from my own clinical practice to infuse a sense of reality into the process (Cooper et al., 2010, 2016). The construction of the simulation was content validated by a senior member of the nursing and medical team for its accuracy. This information was used in a simulation, and it was cross-referenced from hospital records as detailed by a Datix report, from the attending medical team dealing with the patient at the time of the incident. All identifiable information had been removed or blotted out to maintain patient confidentiality.

The simulation exercise again became the focus of another validation tactic. This had been completed in the context of a semi-structured interview, which was once again recorded; the participants were not comfortable with a note-taker being present. I opted for a different approach: a peer review / debriefing session, which is one of validation strategies advocated by Creswell and Miller (2000). I approached a member of the senior nursing team based in the Trust, who was not associated with the study. A meeting took place, and we discussed the following: the interview process and consent, the development of the simulation exercise, its validity, and the outcome of the exercise. The nurse was asked to select one of the sealed envelopes containing the written transcript of the completed exercise transcribed by myself, plus a signed copy of the participant's transcript to compare and validate the information. In doing so, the content of the interview transcript was confirmed, thus it became validated.

The final validation approach required an independent note-taker to sit in on the focus groups. The nurses consented to this despite not being comfortable in the Phase Two interviews. According to participants, this was due to it being a collective construction of ideas from the group and less invasive for them individually. The same senior nurse who became involved with the peer review session kindly volunteered to become the note taker. This involved her being present at each of the four focus group sessions, to ensure accurate recording of critical data during the discussions. The sessions were also audiotaped. I only managed to take very brief notes, as my focus was on the conversation flow, and then we compared both sets of information (Richie and Lewis, 2006; Bryman, 2008; Franz, 2011).

4.10 Summary

This chapter has outlined the methodology and methods used in this interpretive descriptive study, illustrating the philosophical, ethical underpinnings and the steps taken to ensure a rigorous approach. The selected approach ensures consistency throughout all phases of the study, where all aspects were underpinned by a naturalistic constructivist's view of the participants' world. Confirming the values of the multiplicity of the participants' realities and perspectives facilitate a co-created understanding of their experiences, by interacting with each other and the researcher. The next chapter presents the findings from all three distinct phases of the study.

Chapter 5: The Findings of the Research study

5.1 Introduction

This chapter presents the highlights of the findings of all three phases within this study. The Chapter begins with an overview of the thematic analysis derived from Phase One, and then proceeds to the remaining other two phases. All main and subthemes for each phase are illustrated. The main themes remained unchanged throughout each phase, whereas the subthemes differed very slightly within each phase, some refining of the subthemes was needed as illustrated within this chapter.

Phase One emerged as a crucial starting point for this study, providing a detailed account of factors influencing this level of practice. The literature in this field of inquiry provided the background relating to this phenomenon. The constructive themes, reassuringly in one sense, mirrored some themes identified within the literature (Cioffi, 2000; Andrews and Waterman, 2005; Douw et al., 2016; Hogan et al., 2019; Azimirad et al.,2020; Burke and Conway, 2022). The presentation of the findings is accompanied by a brief narrative alongside the theme development, as expressed by the participants within all the three phases of the study, from a descriptive, constructivist and interpretive perspective.

5.1.1 Demography of the sample

In terms of the characteristics of the participants, most of the 46 participants were female (n=42), while the number of years in clinical practice varied: 12 months or less (n=9), 1-10 years (n=13), 11-20 years (n=12), and >20 years (n=12). Educational attainment of the sample consisted of certificate level (n=16), diploma level (n=19) and degree level (n=11). The representative number of nurses working within medical wards was n=22, from a mixture of specialties, including stroke unit, gastroenterology, haematology, bone marrow transplant unit, respiratory and cardiology wards. The remainder worked in the surgical domains (n=24) ranging from vascular, hepatobiliary, colorectal, orthopaedics and renal wards.

5.1.2 Phase One: Identification of the themes

The thematic analysis in Phase One identified factors influencing the care and management of the deteriorating patient, and several subthemes were also identified. The series of themes demonstrated a clear association with each other, as illustrated in Figure 5 below.

Main themes		
1.Packaging deterioration to the medical staff.	**2. Intuitive knowing.**	**3. EWS – a blessing or a curse.**
Subthemes	**Thematic linkage to main themes**	
1. Competence. 2. Credibility. 3. Communication. 4. Litigation. 5. Workload.	Packaging deterioration, intuition, EWS score. Packaging deterioration, intuition, EWS score. Packaging deterioration, EWS score. Packaging deterioration, intuition, EWS score. Packaging deterioration, intuition, EWS score.	

Figure 7: Main themes and subthemes constructed in Phase One

The main themes demonstrated a strong presence throughout the transcripts. The coding procedure assisted in grouping the themes collectively and then re-naming them with an overarching thematic name, such as the theme of packaging deterioration to medical staff. This theme presented in many different forms within the transcripts, therefore, for clarity and ease of reporting, this collective name/label was applied, and this process was echoed for the remaining main themes. Some of the subthemes had a more persuasive link to the main themes than others, for example confidence. This subtheme had little presence within the literature, implying a reduced significance. Its value became apparent within this study, highlighting the significance of this theme, as shown within this section.

Firstly, the presentation of the main themes will be overviewed, and the subsequent paragraphs will use exemplars extracted from the interview transcripts to illustrate

insights of the participants' narrative to enhance the readers' understanding of the themes generated.

5.1.3 Packaging deterioration to the medical staff

The participants tended to regard their working relationship with the medical staff as being close although professionally dissimilar as their responsibilities, skills, knowledge, and aptitude were different. The following exemplars provide a snapshot of the participants' views relating to their relationships with medical staff.

> *The doctors' trust you more when, they know what you're like, cos the registrars that I have worked with over time, know me and what I am about. So, they trust my judgement and likewise (P 07).*

> *Sometimes it works better when you and the doctor know each other. I think it's like, a mutual trust between each other. We both know what each of us are capable of (P 03).*

Both participants above described their mutual respect of the medical staff in terms of their clinical credibility for each other. This reduces the communication barriers between both nurse and doctor, giving the impression this facilitated the patient review sooner rather than later. The participants related to the junior medical staff as assistants in terms of the practical task allocation. However, when it came to knowledge base and academic achievement, most felt the doctors were superior to them in this area (i.e., medical knowledge) and believed that they were "the authority" and claimed they would not be confident to challenge them. This stemmed from them feeling overpowered by their medical knowledge exerting a superiority within the relationship. As mentioned below by the participants':

> *We have a mutual respect. My knowledge is ward-based, so we work well together. I can point them in the right direction, and they respect my experience; they always are in charge. Their knowledge is far greater than mine (P 04).*

In terms of the doctors' knowledge, some of the participants related to this by feeling intimidating at times, they perceive the doctor as having a wealth of knowledge,

regardless of seniority. When probed more about the meaning of this and how this affected them, they replied,

> *Cos, they know more than you, it makes you feel inferior to them (P 03).*

> *This knocks your confidence, cos they know the answer and you don't. Sometimes they make you feel like you're just guessing (P 06).*

Several of the participants believed the doctors are convinced the participants rely on "intuition" owing to the differences of the nurses' knowledge base compared to doctors.

During the interviews, the participants were asked to reflect on the following scenario: "if you had a patient you considered to be deteriorating in health and their EWS score was 7 or above, but the doctor on the ward said that they were aware of the situation, what would be your action?"

> *I have many years under my belt within this specialty. I know when a patient is unwell and know what would happen if I don't act upon it, so I would ask the doctor to review the patient and document it (P 08).*

Some of the participants could relate to this situation more than others, as they had experienced this. One commented:

> *I would have no hesitation in calling a MET, as the EWS breached the pathway for a MET call, I wouldn't ask, I just put a MET out. At the end of the day, it's up to me, not the medical staff (P 04).*

It was interesting to see the variations within this response. Most responses revealed that nurses followed the medical teams' decision-making, regardless of their level of seniority. Furthermore, the participants were insistent that the doctors document their conversation, shifting the responsibility over to the medical staff. Some of these issues mentioned within this section encouraged a discussion around clinical credibility, involving both parties. The participants felt they had more of a voice if the doctor was

known to them and aware of their experience and knowledge. This issue was highlighted again in the development of other themes, as discussed in the next paragraphs.

5.1.4 Intuitive knowing

This section has the potential to overwhelm the reader, as this theme yielded a great deal of data hence my reasoning to highlight just the key elements to illustrate the points raised. The participants actively steered towards their intuitive account of the situation to legitimise their held beliefs, actions and, most certainly, the first stage in their assessment and recognition of patient deterioration, as described by the following two exemplars to illustrate this point:

> *I am an experienced nurse, with that comes natural intuition; you just know when something is wrong with a patient. It could be he is not as chatty as the day before, or he is not eating or drinking very well. There is always something that gives you a clue; it's your gut feeling there is something wrong (P 09).*

> *As you know the patient, you get to know their ways. So, you know when there is something wrong. When they are not themselves, you have this gut feeling of knowing something is not right, and you need help (P 01).*

The participants explained their thoughts within the interviews and described their recognition process through their intuitive perception of the situation, rather than relying upon a more objective assessment. As stated within the above exemplars the participants were feeling something was wrong prior to any objective measures to validate this situation. The problem they faced was the inability to articulate their concerns in objective terms to the medical staff, to prompt a review. The participants were mindful their subjective thoughts and feeling about the patient's condition may not prompt the review needed. The following extract was common amongst the participants; this example captures the meaning of this succinctly:

> *The patient to me looked unwell, I and been looking after this patient all week. She was hot and clammy. I could not explain it to the doctor what it was, but he come anyway, just as well, she had a Myocardial Infarction. Observations were*

all normal, no history of chest pain. I just knew there was something not right with her (P 02).

Many of the participants reported feelings of being isolated in their decision-making, feeling stupid and inadequate as the doctor made them feel this way when escalating the patients' needs. The participants were relying solely upon their intuitive observations, but it seemed the ability to defend their assessment became even more difficult to convey to their senior peers. The process of their patient assessment appeared ambiguous, and it was difficult to follow their chain of thought, as illustrated:

I remember I looked after a patient. He said he just didn't feel right. All his obs were fine; he said he felt a little muzzy in his head. Then during the shift, he just went off big time. He had an intracranial bleed, then palliated within the same shift. It really shocked me how fast it was (P 10).

The above participant (P 10) was surprised due to the rapid decline of her patient. The patient had an extensive cerebral bleed not compatible with salvage neurological surgery. The fact that the participant highlighted a very subtle change in the patient's health was significant. She recalled the lesson she had learnt from this experience is to

Listen to what your gut instinct is telling you, regardless of what the EWS score is (P 10).

The participants elaborated more on this point of trying to sell the subjective clues learnt from knowing the patient rather than relying on the objective evidence of deterioration, as illustrated by the following participant:

Doctors, I think rely on the EWS too much. They can't seem to see the bigger picture like us nurses, cos we know the patients, spending time with them. I had a woman who appeared a little confused compared to the day before. The obs were fine, no temperature, no raise in the resp rate, but she had bilateral pneumonia (P 08).

The participants utilised their intuitive and experiential knowledge to inform the process of recognition and response to patient deterioration. As expressed by the participants, they found this challenging to convince their medical colleagues to conduct a review. Interestingly, none of the participants relied upon any theoretical knowledge to justify their assessment.

5.1.5 EWS – a blessing or a curse?

The participants used the EWS score to authenticate their findings. However, when the score was low, it became even more challenging to escalate the patient's care, as they could not offer any rationale for this. This has been highlighted in the previous paragraphs relating to the use of intuition, which is intrinsically linked, as demonstrated from the following exemplars:

> *I have often spoken to the doctor and said, this lady is not right, but her EWS score is 3 and the doctor just says, 'If I get time I will see the patient, but I have several things to do first'. You feel stupid sometimes, if you're wasting people's time, but you have this gut feeling (P 05).*

During the interviews, the participants highlighted their understanding of why the doctors were not responding when the patient is below the breach threshold. One of the participants responded as follows:

> *The patient can still be sick even though the EWS is 3 or below. I have seen patients actively dying with a low EWS. So, it's not the be all and end all, you must use your eyes, experience and your gut feeling sometimes, does that make sense (P 06).*

The medical team request objective evidence, due to the fact they are seeing a range of patients often not just located within one ward, or are they reserving their skills and knowledge for patients who need their time, effectively prioritising their workload?

The EWS system is used as the track and trigger system within the Trust and all the participants were familiar with the system. Interestingly, they focused on the numerical score used in the system, as the higher score strengthened their ability to validate their clinical decisions. Many of the participants commented on the strengths of the EWS system, one example of this is below.

The EWS is a godsend to any nurse, as the doctor must see your patient with a high EWS, or they will get seen at a MET call (P 09).

The participants relied upon the elevation of the EWS system to ease the request for a medical review, as they were familiar with the Trust policy to action this. According to the participants, if the EWS score was below the breach threshold, this also reduces the possibility of a medical review. Their reasoning for this relates back to the use of intuition rather than a more objective means of assessment. As they suggest, the medical team would not consider their opinions of the potential health deterioration based upon the nurses' subjective opinion. In this sense, they were claiming to recognise early signs of deterioration, and identifying those strategies in place to enhance this early recognition were hindering this process. The following illustrates this point in more detail.

My patient looked grey. I thought it was related to his Abdo pain. The doctor said, 'Give him more pain relief, his EWS is only 2, so he should be all right for a review if he gets worse later'. He was taken back to theatre later that day, found to have an ischaemic bowel, and then he was palliated. Nothing we could do for him. I felt angry and upset, if we had acted on his symptoms, could we have saved him? This still haunts me now and we are going back a few years (P 03).

When asked for a little more detail. The participant mentioned the fact the patient's pallor had changed and he was increasingly more uncomfortable with central abdominal pain. This patient had undergone emergency surgery for a strangulated umbilical hernia five days previously. The abdominal pain had worsened from the day before, suggesting a new symptom which the participant had recognised. The patient had morphine on board to control his pain. The medical team for whatever reason failed to review this patient in the eyes of the participant and this still has a resounding effect on her practice.

The example below continues with this theme, as the participant was trying to engage with the medical team in relation to their patient concerns. The participant took matters into their own hands and decided to escalate the patient's care due to their "gut feeling," not necessarily the EWS score for the patient:

I was told off by the doctors for putting out a MET call whilst they were in the middle of the ward round. I had already told them about this lady. She had EWS score of 3, but they didn't want to review her. I knew there was something not right. So, I put out a MET call (P 08).

This participant (P 08) is an experienced nurse with a varied background in acute medicine. I became intrigued to learn more of her decision-making regarding activating the MET call. The nurse realised this patient had the potential and was in fact deteriorating despite the EWS score. She then went on to explain that the activation of the MET call occurred as a result of her experience. This gave her the confidence to support her own "intuitive thoughts" to activate this MET call. Even when questioned by senior medical staff she stood her ground according to the nurse, as she knew this lady was unwell.

Within the transcripts, there is more detail of how the participants recognise the early cues of patient deterioration, even though the patient was not breaching the EWS threshold. The participants reported the difficulties they had faced in attempting to escalate the patient care. Within this analysis, there is evidence to suggest that some of the participants were recognising the early warning cues of patient deterioration. However, due to factors beyond their control, these cues were not acted upon because of the reasons already mentioned, namely owing to the lack of medical review. The literature in this field of inquiry repeatedly emphasises the failure of nurses in the rescue of the deteriorating patient due to missed cues. The question for me as the researcher is: are nurses missing the cues of patient deterioration, or are they simply facing the difficult challenge of escalating the patients' care, as suggested by the participants within this study?

5.1.6 Competence

Competence had little exposure in the analysis, with a limited number of participants commenting, in contrast to the other subthemes. I noted that four of the participants were repeatedly referring to "competence." Initially, I thought they were confusing the word "competence" with "confidence," therefore, I needed to clarify this. Their interpretation of "competence" it appeared was related to their recognition and response to patient deterioration. The four participants were asked for more feedback, post-interview, in terms of what they meant by competence, and they answered as follows:

> *Competence is repeated practise of the same thing you just develop over the years (P 05).*

I needed to delve a little deeper to understand their meaning. The participants suggested it is a combination of several 'things. An example is the combination of confidence, intuition, and knowledge. All these themes are conceptualised in terms of describing a medium used to action an outcome, to recognise and respond to patient deterioration. Alternatively, they aspire to prove they have the skills and knowledge to demonstrate their competence in orchestrating a co-ordinated response to arrest any further health deterioration. This was important for these participants to reveal this knowledge. The findings were as follows:

> *Being and feeling competent in dealing with the deteriorating patient is important to me, as this makes me who I am, not just your average ward nurse (P 10).*

Following much deliberation and time, we collectively came to a consensus on what the word "competence" signified to those participants. This indicated deeper connotations of exhibiting their skills and knowledge as an experienced nurse, to symbolise their professional credibility in the company of their medical colleagues. We co-decided to use the following definition of competence to aid their understanding for future reference, selected due to its realism they could relate to:

> *The ability to act by combining knowledge, skills, values, beliefs, and experience acquired as a nurse (Fukada, 2018, p 3).*

5.1.7 Credibility

This subtheme was reported by many of the participants in a variety of forms within the transcripts, as illustrated within this section. The importance of this subtheme appears underestimated. The participants felt that this is a key to remove some of the communication barriers between the doctor and nurse. Several citations were visible in the transcripts relating to partnership, relationship, knowing each other, knowing the similarities of working together etc. The participants related to this work relationship by having their own level of expertise recognised and respected by the medical staff. This was of importance to the participants, as well as being essential to the early recognition of patient deterioration. By having this mutual respect, this made the escalation process seamless, according to the participants:

> *When, both of you are known to each other its better, cos you have a sort of trust in what you're saying (P07).*

The importance to the participants was the recognition of their worth in terms of years of experience and knowing. They commented on building this relationship in a short time, utilising their clinical credibility as a foundation of this relationship. According to the participants:

> *If you know what you are doing and have the experience behind you to back this up, this makes it easy to get on with each other; you know the practicality of ward and the junior doctors need this information (P 01).*

Some of the participants alluded to the relationship between the nurse and doctor as a power shift, with the nurse having a more influential power base than the doctor through having general nursing and patient experience. However, this power shift becomes reversed when relating to the doctor's "power" of knowledge. The nurses guide the junior doctors through the processes needed to complete the task or the outcome of the situation. This subtheme appeared influential in combination with other subthemes, which blended with competence and confidence and became embroiled within clinical credibility.

I think your own credibility as an experienced nurse shines through when you have worked with certain doctors, and they trust you to do a good job, plus I trust them (P04).

Your nursing skills and experience gives you the credibility needed; your colleagues just need to recognise it (P05).

5.1.8 Communication and Litigation

Communication was centred around the escalation process and the legal implications in relation to a failure to rescue the patient. The participants reported these two themes simultaneously in a variety of forms, for example alerting the medical staff to the potential of patient deterioration, asking for advice, and needing medication prescribing etc. The participants commented on the fact that locum staff, the staffing levels, and the acuity of the ward all hampered their efforts in their recognition and response skills. Nonetheless, they also reported they would often escalate the patient care to the medical team, and they would fail to review the patient. Consequently, the patient condition would deteriorate even further, resulting in a MET call. The participants highlighted their patient safety concerns, as follows:

My patient was reported to have been unwell in the morning, and the medical team failed to review the patient in the afternoon. This led to the patient having a cardiac arrest and passing away that afternoon (P 03).

I called the doctor to review my patient with pain, I must have contacted him four times, before he eventually came to the ward, the patient made a formal complaint that sadly, I was involved with, this is not right, the doctor should respond to our concerns (P08).

Their apprehensions featured around the language used to convey the information to the medical team and fear of using the medical jargon incorrectly, as mentioned previously. This created a barrier to the communication between the doctor and nurse relationship:

I can't diagnose a patient's condition like a doctor, but I know when they are unwell, and I think that's the important part, so the doctor can review the patient (P02).

After years of experience of caring for patients, I know when a patient is ill (P10).

I am not attending any coroner's inquest for nobody (P 06).

None of the participants referred to the SBAR communication tool. This has been adopted to improve the level of communication between the healthcare professionals. As mentioned within this chapter previously, the Datix report is escalated in response of EWS threshold breach, which investigates the reasoning process of the breach within the Trust. This increases the anxiety in staff members, as the participants reported most junior members of staff find this hard to deal with and feel challenged:

Apart from your own knowledge and experience which we rely on, we have nothing else to help us, really (04).

The minute anything goes wrong with a patient, if you have not followed the right policy, you are in big trouble and we all know this, therefore we panic so much when we have a poorly patient (09).

5.1.9 Workload

The hospital wards are often referred to as turbulent working environments owing to the competing priorities as experienced by the staff. Consequently, this encourages elevated levels of stress, this is associated with the lack of control, work pressures, as illustrated by the participants below :

No wonder we find patients unwell, we don't have the time to spend with the patients anymore, the workload has gone mad (P04).

I have doctors, other staff, porters, patients, and relatives wanting to speak to me all at once, about a variety of issues, my job list is never ending sometimes (P10).

The agency nursing staff they send to us to help, are more of a hindrance, you can't trust some of them to look after a poorly patient, cos at the end of the day it's my registration on the line, running the ward (P03).

The participants stated they are frequently challenged and questioned by relatives in relation to the medical care given. Often, the relatives would relate their concerns in the context of medical –legal litigation, which escalates the level of stress encountered, and often hinders the communication process between both parties. The variations in the dependency and acuity of patients were identified as presenting problems, indicating a ward may have high dependent patients, but low acuity, similarly, the quiet undemanding patients may in fact be becoming critically unwell, as highlighted below by some of the participants':

Some of these patients should be cared for on HDU or in ITU, they are so poorly, and they require a lot of nursing care and a watchful eye (P 04).

The heavy workload of patients is often due to the fact that, nowadays, patients often have multiple co-morbidities, he may have come into hospital for a hip replacement, but also has dementia, heart failure and had a previous stroke, so needs all care(P01).

The managers do not really understand what it is like on the wards, the pressure on us as nurses is immense. I often go home worrying about if I have given the correct drugs to patients, did I report the patient illness. This is not a healthy working environment (P06).

The participants' held strong views aimed at the management teams to create more nursing posts and reduce the number of agency nurses. Many of the participants are also employed to cover extra work on the "Pool" or "Bank," which employs their own nurses, as an extra shift to cover the workforce shortfalls. Some felt it was their duty to cover extra shifts to assist their colleagues as highlighted below:

I couldn't go home and leave my colleagues to get on with it, I wouldn't forgive myself if anything went wrong, we all look after each other, you often just ask yourself, when is this gunner stop (P09).

I used to do a lot of bank to help, but to be honest I just become worn out by the whole thing, it's just doesn't stop (P01).

5.2 Phase Two: Virtual Patient Simulation

The aim of this exercise was to observe the participants' recognition and response to patient deterioration, through the stages of a Virtual Patient Simulation (VPS). The VPS is based upon a MET call extracted from my own clinical practice, reproducing the physiological parameters to increase its fidelity. The MET call incorporates the patient's journey from the front door emergency services, through the admission process into an acute NHS Trust. Through this process, five stages of patient movement were identified. The VPS is synonymous with each stage of this journey, allowing the participant to explain in detail their actions, decisions, and response at each stage, before moving onto the next (see Appendix 1, p277). The themes identified in Phase One continued to stream through into Phase Two, as illustrated in Figure 8. Highlights from the findings are displayed within the following paragraphs.

This section will begin by providing the clinical information relating to the scenario, before moving forward to discuss each individual stage, from one to five. Upon completion of the VPS, each participant was given a detailed physiological explanation of the VPS, together with the definitions of both neutropenia and sepsis to aid their understanding of these conditions for future learning (see Appendix 7, p 295).

Main themes		
1.Packaging deterioration to medical staff.	**2. Intuitive knowing.**	**3. EWS – blessing or a curse.**
Subthemes	**Thematic linkage to the main themes**	
1. Recognition of the problem. 2. Confidence. 3. Specific knowledge. 4. Decision -making. 5. Anxiety.	Packaging deterioration, intuition, EWS score. Packaging deterioration, intuition, EWS score. Packaging deterioration, intuition, EWS score. Packaging deterioration, intuition, EWS score. Packaging deterioration, intuition, EWS score.	

Figure 8: Main themes and subthemes constructed in Phase Two

5.2.1 Clinical information relating to the scenario

All the participants immediately recognised the potential diagnosis of neutropenic sepsis. During the VPS, each participant spoke aloud as they followed their own linear methodology. Whilst completing the VPS, it was observed they used both pattern and similarity recognition to identify occurring problems, relating this back to their own clinical practice describing this process as intuition, as illustrated:

> *I don't know how chemotherapy works, but I know these patients become ill quickly after the chemo is given, but I don't know why, I just know, I have seen this load of times before (P 24).*

> *My gut feeling is telling me this patient has neutropenic sepsis, due to the high temp and tachycardia I have seen this before (P 18).*

I have seen this presentation before in patients having chemotherapy, and they can be poorly with sepsis (P 13).

Is this intuition as described by the participants or are they simply using their experiential knowledge to identify a pattern, then due to their lack of knowledge in this field they relied upon their subjective account of the situation? Some participants were more articulate than others when interpretating the EWS score, before finally arriving at their differential diagnosis of either "neutropenic sepsis" or "sepsis." Most of the participants reached this diagnosis without any prior theoretical knowledge of neutropenia or sepsis and were solely dependent on their intuitive perception, and experiential knowledge to inform this decision. It was interesting to observe the participants arrive at their clinical diagnosis with knowledge of the barriers they would face before seeking to escalate the patient's care, as demonstrated by one of the participants below. Table 19 highlights some of the findings in relation to the clinical information discussed.

This is an area where I lack knowledge in, so my confidence in escalating the patient care would be knocked if the doctor were to disagree with my assessment. This is the problem why patients are not reviewed and then go off quickly (P 26)

Participants' Recognition	Participants' Response
• **All participants** recognised the potential of deterioration as sepsis. • Majority had no knowledge of chemotherapy. • Some participants acknowledged the side effect profile of chemotherapy. • **All** participants appreciated the clinical urgency of the situation.	• **All** would escalate the patient to the medical staff, through the familiarity and pattern recognition of the condition NOT the objective evidence. • All participants noted the patient had chemotherapy, plus the likelihood of neutropenia, was rated highly.

Table20: Participants' Recognition and Response to the clinical information: simulation exercise

Some of the participants were fearful in making the wrong decision in terms of escalating the patient's care, potentially feeling foolish in front of their medical colleagues, adversely affecting their clinical credibility if they misread the situation or worse, used medical terminology out of context, undermining their confidence.

5.2.2 Stage one: recognition of problem

All the participants recognised tachycardia and associated this with sepsis, although they showed little understanding for the reason of this. According to the participants, they understood the word "sepsis" to be synonymous with health deterioration; all had experience of dealing with this syndrome in relation to patient deterioration. Moreover, only a limited number of the participants were aware of what "sepsis" is. Whilst, unaware of the definition of sepsis, all the participants recognised the potential for health deterioration at this early stage within the VPS, demonstrated as follows:

> *The patient is only scoring a 2 on the EWS system, I would find this hard to get a doctor to review this patient, he has not long been seen and he has had his first line antibiotics and has a treatment plan. I know this patient is gunner go off thou (P 11).*

The participants focused on the tachycardia as the main problem (see Table 20) but felt frustrated knowing that the medical staff may not review the patient due to the low EWS score, as explained by the participants above and below this paragraph. Owing to the Trust policy, they believed that their concerns would not be considered, and felt the EWS acted as a barrier at this point, leading them to suppress their actions in many ways:

> *The doctors often just ignore what the nurses say, but when the patient becomes unwell, they blame us for not telling them about the patient. We all must think about the consequences of this, that's what is scary (P 29).*

Participants' Recognition	Participants' Response
• **All participants** recognised the patient had tachycardia as a main problem. • Seventeen participants utilised Intuitive / experiential reasoning to support their differential diagnosis of neutropenic sepsis. • Three participants held prior knowledge of chemotherapy and neutropenic sepsis.	• **All participants** reported their frustration of the EWS score. Knowing the patient was unwell, and they were aware of the potential deterioration of the patient. • Barrier to escalation – the low EWS score would prevent the clinical review, and this is supported by the Trust policy.

Table 21: Participants' Recognition and Response in Stage One of the VPS

5.2.3 Stage two: simulation exercise

The participants persisted with their differential diagnosis of neutropenic sepsis and acknowledged the tachycardia as well as the patient's other symptoms, such as low urine output, looking flushed, and becoming agitated. The EWS score remained low. Many of the participants were repetitive in describing the difficulties they would experience in their efforts to escalate this patient's care, such as relationships with the medical staff, feeling intimidated by their knowledge, using pattern recognition but being unable to articulate their reasoning.

Due to other presenting symptoms, they also broached the subject of employing other means to apply more objectivity to their assessment, such as a non–invasive bladder scan to detect the volume of urine within the bladder, coupled with further laboratory investigations to confirm any deviation from previous results. The participants were clearly signposting further deterioration of this patient's condition, as shown:

> *It's not just about the tachy. This time he has other problems, like not passing urine and he is quiet, and sounds unwell. I have dealt with this type of patient before, so I would bank on my experience to explain this (P 16).*

This part of the findings demonstrated the participants' dissatisfaction in the way the EWS system would create a barrier to prevent further escalation of this patient's care. The EWS score was incorrect, as in the case of the actual real-life MET call creating a communication barrier between the doctor and nurse. The actual EWS score for this

patient was 5 due to tachycardia registering as n=3 on the EWS chart, a raised respiratory rate (n=1) and agitation (n=1). An EWS chart was made available for the participants to refer to if needed during this simulation. Some of the participants had noticed the incorrect EWS score, making them more determined to have this patient reviewed, as mentioned:

> *I am telling you; this man is seriously unwell. That EWS score is telling me nothing. I would see with my own eyes he is unwell, if they don't see him, I am putting out a MET call, simple as that (P 28).*

Interestingly, some of the participants had established the nature of this patient's health decline, and yet some of them, it would appear, remained focused on the numerical presentation of the EWS and not their own assessment of the situation. I asked some of the participants to elaborate on this point to gain further understanding of this process. The following is an example taken from one of the participants:

> *The doctors go mad if you put out a MET call, if the patient's EWS is low, they only look at the number and the management team do as well, but you know what I don't care if that patient is safe (P 14).*

Some of the participants held strong views regarding the "culture" within the organisation. They explained being fearful of the consequences they faced if the patient deteriorated further. They also raised questions about the safety infrastructure within the organisation, as the systems primarily placed to encourage surveillance of the patient deterioration can often hinder this process due to the policy language used. At this stage of the VPS, the participants recognised further health decline, plus the EWS score was incorrect, combined with their thoughts of EWS hindering the escalation process. Moreover, they had highlighted the elements of their patient assessment more visibly during this stage of the simulation, adding to the construction and understanding of this process. Their collective actions are shown in Table 22. At this stage, they felt more confident to activate a MET call due the discovery of the incorrect EWS, giving them the confidence due to the high numeric score.

Participants' Recognition	Participants' Response
• **All participants** recognised the patient deterioration through their Intuitive / experiential reasoning to support their differential diagnosis of neutropenic sepsis.	• **All participants** reported to activate a MET call for this patient at this stage of the VPS. • **Some** of the participants recognised the EWS score was incorrect and would activate a MET call on this information alone.

Table 22: Participants Recognition and Response in Stage two of the VPS

5.2.4 Confidence and specific knowledge

These themes emerged frequently throughout the analysis with a high occurrence, suggesting the importance of these subthemes. They loaned themselves to the mainstream themes as important attributes, needed it seemed to activate both recognition and response to patient deterioration. These sub-themes occurred with limited exposure in the literature review. Nonetheless, they maintained a strong position compared to the other subthemes within this study, although the repetition was not parallel to that of the main themes. The following exemplars express the importance of confidence and knowledge to this level of clinical practice:

> *I think it's the fact you don't know what causes the issue with confidence, doctors have a greater understanding than me (P 19).*

> *My confidence is low in this area, cos, really there is so much that can go wrong I can't know everything, but I know when to get help, that's the main thing (P22).*

I became intrigued to discover more about the participants' level of confidence and knowledge, and how this influenced their actions. They described how they would recognise a cue (tachycardia) to indicate something was different with the patient, but they were unaware, it would seem, to the reasoning behind this difference. They

implied that their perception of their own knowledge relating to the deteriorating patient was superficial compared to the medical staff. According to the participants, this made them feel even more nervous and vulnerable, as the terminology used to express the findings from their assessment may not be accurate or used out of context. The fear in this instance was the possibility of being ridiculed by the medical team. This made them feel intimidated by the knowledge the medical staff hold. The following is examples explaining this point:

> *Although the patient is unwell and is being treated for sepsis, I would be concerned about this tachycardia. The doctor would tell me, the patient has a plan in place and does not require a review. At this point, I could only agree with the doctor as I don't have that specific knowledge to explain otherwise, however, I know this patient's condition is worsening (P30).*

> *Its neutropenic sepsis driving the tachycardia, but I don't know why, I have just heard doctors talking about something similar in the past (P25).*

> *I know its sepsis, and that this virtual patient's condition is worsening, but I would find this difficult to explain this to the doctor, does that makes sense? (P21).*

One of the chemotherapy trained participants held a quite different stance to those without this specific knowledge. She explained, working within haematology neutropenic sepsis is quite common amongst their patient group, owing to the chemotherapy offered to treat the condition. Therefore, she would have no issue in having a further discussion with the medical team to review this patient. The participants' knowledge was a mixture of theoretical (chemotherapy course) with a vast amount of clinical exposure leading to rich experiential knowledge. I asked her to elaborate on this in more detail, and explain why she thinks the patient's condition is worsening, she replied as follows:

The patients' condition is NHL, normally treated aggressively with chemotherapy, after having this, the white cell count reduction time is 7-10 days making the patient susceptible to infection. This patient presented with signs and symptoms of neutropenic sepsis, high temperature, not feeling well, 10 days post chemotherapy. The

tachycardia, is indicating the worsening picture, caused by the underlying sepsis creating vasodilation, if left untreated the patients' blood pressure will decrease. I would have no problem in asking the doctor to review this patient, if for a reason they are unable to, or unwilling to review this patient, then I would escalate to the medical registrar and place a MET call (P17).

The confidence of the above participant was obvious, and present due to her specific knowledge of chemotherapy and the trajectory of neutropenic sepsis. The specific knowledge was coupled with, and more likely to be reinforced by years of clinical practice leading to the rich pickings of experiential knowledge. Interestingly, the level of knowledge was linked to pathophysiology, and pharmacology related to the situation. The participant claims her specific knowledge and experience would often be greater to that of her medical colleague she would ask to review the patient. This is owing to several factors, one being the on-call rota, if those doctors covering this ward had little experience, this places more responsibility on the nursing staff. An interesting comparison of this situation, was hearing from those participants who do not possess this specific knowledge, in which they conclude without exception they would find this challenging as illustrated below:

I know the tachycardia is an issue, but I just thought this would be caused by the sepsis, but I don't really know why (P27).

The doctor would have to make that decision if they needed anymore treatment, but I would ring them again if the patient's condition worsened (P 12).

The participants continued to use their subjective and experiential knowledge to inform their patient assessment. A limited number of the participants were relying upon theoretical knowledge to interpret the EWS system, the patient assessment and, more crucially, their ongoing communication to the medical team. Some of the participants offered a brief explanation of this:

> *The suddenness of the situation and because it's an emergency, your nerves just get the better of you, if you ask other nurses, they will tell you (P 14).*

The low score of the EWS system would prevent a review from the doctor, but I think it's important I escalate this man's care, as something is not right (P17).

5.2.5 Decision–making

It appeared to some of the participants that their contribution to the decision-making process was negligible. The reason for this was evident in the analysis and was due to the fact the participants believed the medical staff maintained the monopoly of decision making. This is true in one sense. Nevertheless, the participants made a choice to escalate the patients' care based upon their assessment and the perceived risk of health deterioration. This became the starting point of the decision-making process. Interestingly, several of the participants had not considered this as a valid claim to decision-making. They attributed the action of referring to the medical staff as the policy of the Trust. Therefore, this was something out of their control. A small number of the participants dismissed the possibility that the escalation of care remained their decision, as illustrated by the following exemplar:

I don't think we make that decision, this should the doctors' decision really as they are more informed than nurses (P20).

Some of the participants discounted their initial decision to escalate the patients' care, as they perceived this to be a component of the Trust policy. After reviewing the policy at that time, I discovered no evidence to suggest the participants were correct. The policy stated that if the EWS score breached through the threshold or if the EWS score was raised within a single parameter, medical assistance was required. The fact that many of the participants were acting upon their recognition and response to the situation verifies that they were making the initial decision to escalate the patients' care appropriately.

This theme presented similar to that of a swinging pendulum with a complete contrast at either end, as highlighted by the following:

This patient was scoring low on the EWS, but the patient was actively dying, no wonder we are confused (P 17).

The EWS score is crucial in helping us make that decision, cos, when its high the policy just takes over, the doctor must come and review the patient (P15).

During this simulation I would MET this patient, cos I know he will become unwell in another couple of hours, he doesn't sound right to me (P22).

The differences of opinion regarding the participants' decision-making ability were remarkable, considering the majority were very experienced nurses. All the participants engaged their intuitive and experiential interpretation to inform their decision-making in this instance. However, as mentioned, if the EWS score was low they had difficulty in referring the patient for a medical review, as illustrated by some of the participants:

The problem is my knowledge base of chemotherapy. I have seen neutropenic patients in the past go off quickly, and needing ITU services, this is what concerns me (P 19).

I think if my knowledge were strong enough this would enable me to make the decision to escalate this patient care more rapidly (P23).

My experience in dealing with these types of patients on a medical ward would encourage my decision making, because I have seen the outcome (P 13).

The participants' believed they placed too much emphasis on the EWS scoring system to make decisions. The decision process initiated by many of the participants either during the VPS or within the interview was subjective, using the EWS score to validate their findings. However, with the lower score this became a curse, as the difficulty arose when attempting to escalate the patients care, as follows:

Even when the EWS score is low, you know that there is something wrong with the patient (P13).

It is hard to try and explain what it is you feel is different about the patient you know it is(P28).

The simulation patient is typical of what happens in practice, I come across this lots of times, and each time it doesn't get any easier(P19).

5.2.6 Stage three: simulation exercise

Some seven hours had now passed since the patient initially presented with disturbing vital signs. The concern was even greater due to further elevation of the patient's pulse rate and increased temperature. None of the participants could explain why the vital signs were physiologically deteriorating; when asked, they packaged this as "sepsis." The medical team would be aware of this and, as mentioned, had already instigated clinical plans to treat the underlying sepsis. The participants intuitively were aware this patient warranted a further medical review. They were repetitive in conveying their anxieties in relation to the low EWS score and considered this as the factor for the delay in a medical review, as follows:

> *I think his EWS is higher than a three, cos of reduced level of consciousness, so I think the doctors should come and review him. If they still say no, I will just call the MET team (P 21).*

The participants alluded to their lack of theoretical knowledge of sepsis and its consequences. They remained informed by the patient's clinical symptoms. As indicated within the simulation, this patient's level of consciousness (LOC) was reduced, and he was not as communicative but responded to voice commands. According to the EWS chart, this would increase the score to the following: heart rate (n=3), respiratory rate (n=1), temp (n=1), LOC (n=3), with a total score of n=8. Many of the participants observed these changes in the EWS score. This gave them the confidence to place a MET call for this patient to have an urgent review.

> *There is no argument anymore. The EWS score is high, and its hospital policy to MET this patient (P 12).*

As indicated, the decision became reliant upon the EWS score, giving the participants validation to their claim of health deterioration of this patient, although they had already alerted the medical staff as to their previous assessment of this patient. Despite this, the participants still referred to their intuitive and experiential knowledge to inform this, the difference here being their assumptions were now packaged within an

objective bundle and activated the MET call criteria and Trust escalation policy. The frustrations of the participants were aired during the VPS, as clearly shown:

> *I don't think the doctors and the managers realise how hard this is. They just see the EWS chart as the be all and end all. Well, it's not. You can see that even from this exercise, it's hard to get your point over at times (P 19).*

5.2.7 Anxiety

The subtheme of anxiety took many forms throughout all three phases of the study this was most prevalent within phase two. The main areas of anxiety were related to both recognition, and response to, patient deterioration. The initial discovery of a patient whose health is deteriorating was the main source of anxiety for the majority of the participants. This was linked to them feeling out of control within the situation, having little experience of medical emergencies ,and being unfamiliar with the resuscitation equipment, and finally making the decision to call the MET team as illustrated below:

I have little experience with the crash equipment , so when they are calling out for things , I get really anxious , as I don't know what I am doing or what I am looking for on the trolley when they ask (P19).

When a patient is unwell, I get anxious, what happens if the patient becomes more unwell whilst waiting for the MET team (P21).

I don't worry about those scoring a high EWS, because the policy will kick in, I do get anxious of those patients who you know are unwell, it's just that you cannot communicate this very well (P14).

The simulation served another purpose of the participants' being able to talk aloud signalling where the issues are and what structures they relate to. Most, felt nervous about doing the right thing or looking stupid in front of their medical colleagues, using medical language out of context, and having their credibility undermined as illustrated as follows:

Sometimes, although you know the language doctors use, you don't want to use the same language, cos, I don't really know what some of means(P29).

If I say the patient has a tachy and he is septic, I am comfortable in explaining this due to my experience (P13)

The doctor's knowledge and experience are broader than mine, so I get nervous when trying to give them a diagnosis over the phone is case this is wrong (P20).

The participants alluded to the VPS patient as being a typical example of a situation generating anxiety, as they were acutely aware of the condition and its consequences. The simulated patient presented with sepsis, although a treatment plan had been implemented, the participants main concern was owing to the sudden change in health status, the following exemplars, demonstrate this point:

Because he has a plan in place it would be difficult to get one of the doctors to see this patient. Although my concern is, he could get worst as he has only had one lot of antibiotics (P26).

He had this treatment hours ago, its needs repeating, he can still become unwell whilst all this is going on. We must take on board, he is young, as such he is likely to compensate, so his vital signs may not be accurate(P16).

They could still arrest at any time even when there are plans in place (P 30).

This type of patient is more likely to compensate for his physiological instabilities, due to the fact he is young and fit, it was interesting to hear the participants acknowledge this. This led to a false sense of security according to the participants as illustrated:

I had a young guy post operative after having an appendectomy. All his post operative vital signs were normal, after about three hours of being on the ward he was rushed back to theatre due to a perforated bowel, which occurred whilst he was on the table (P11).

Activation of a MET call also created anxiety amongst the participants. This was due to their own assessment of the patient being scrutinised by the medical team once they arrive on the ward. They elaborated on this fact being associated with the handover to the MET team. This is adequately described by two of the participants':

Once you put the MET out, we are waiting for the team to arrive, the fast bleeps are going off, they are running towards you, and expecting an in-depth handover of the problems(P12)

You are shaking with fear normally, my hands are often hot and clammy, and my heartbeat is racing, it's so scary, because these are normally senior doctors, you don't want to get anything wrong (P 20).

5.2.8 Stage four: simulation exercise

All participants, without hesitation, would activate a MET call because of a high EWS score, which is part of the escalation policy for the Trust. The participants, as previously described, would feel confident escalating the patient's care using the EWS tool to substantiate their argument, as illustrated:

> *The observations say it all. This man is unwell and would need the Intensive care doctors to review him now. If the doctors had seen him earlier, then it's possible it might have been avoided (P 22).*

Those participants who had experienced this scenario in clinical practice were asked to reflect upon their thoughts, emotions, and actions related to the real event versus the completion of the VPS. They were asked: Is there anything they would or could have done differently. Their responses are as follows:

> *Yes, in the real event I took the doctor's advice and waited to put out a MET call, whereas, in this simulation I put the MET call out at the early stage, cos I know the possible outcome (P 23).*

> *This simulation brought it back to me. I felt anxious. My heart was pounding. I know this patient was sick, and I know what I needed to do, even though the doctors would have held off. I would put a MET call out in stage two (P 14).*

The above participants mentioned, despite them repetitively alerting the medical staff, that there was a high possibility their concerns would not act upon. They explained the potential for loss of life, but in addition to this, the way the clinical situation unfolded created an everlasting memory. The participants dealt with the VPS through pattern recognition and arrived at their escalation decision a lot sooner than they expected.

The participants stated that the decision is complete when the EWS is breached as they are compelled to adhere to the Trust policy. Once the MET call is activated, the team will decide on further and appropriate management needed to stabilise the patient. This decision process is removed from the ward doctor. The participants commented on just how effortlessness the escalation process is when the EWS threshold is breached, however, this should not be the case.

5.2.9 Stage five: simulation exercise

The MET team would be attending to the patient at this stage due to the sudden deterioration, instigating interventions to stabilise the patient's condition. The participants were asked to reflect on this situation and describe their understanding of the physiological changes to the patient's vital signs. The following questions were offered to the participants to generate some discussion:

- Why do you think the situation occurred so suddenly?
- Why is the pulse rate elevated?
- Do you know why the blood pressure has suddenly reduced?
- Why has the temperature raised?

The lack of formal physiological knowledge became obvious at this point; when asked the above questions, ALL failed to answer the questions correctly. The generation of information at this stage was repetitive, therefore the following are two examples used to highlight this point:

> *The reason for the temperature increase is sepsis. I don't know how this happens though; I just know it's a sign of infection. I have seen this in neutropenic sepsis. The blood pressure drops and the respiratory rate increases. That's how you know the patient is sick (P 30).*

> *I don't know why the blood pressure has suddenly dropped. I have seen this happen with septic patients in the past. To be honest, this is something I should know. Why do we need to know? We are only nurses after all (P 17).*

When asked directly, the participants were unclear why the blood pressure suddenly fell to 70/40. There was no correlation mentioned by the participants between the heart rate (180 beats per minute) and the decrease in blood pressure. A small number of participants referred to the patient's age, suggesting his fitness level aided intravascular compensation. However, none of the participants alluded to vasodilation induced by

the ongoing sepsis as a cause of hypotension and reduction of the cardiac output due to tachycardia (Levinson and Casserly, 2011).

5.3 Simulation feedback

The VPS exercise received positive feedback from the participants. The feedback was given verbally by the participants at the end of the simulation scenario and recorded. The aim of this VPS exercise was to witness first–hand the processes used by the participants during the assessment of the patient's acuity. This was demonstrated throughout the simulation, as the participants were encouraged to talk out loud as they were completing their patient assessment. The simulation was a staggered release, effectively slowing down this process, which in turn enhanced the understanding of both participant and researcher of how they assessed and recognised the patient's acuity before responding, and then escalated the patient's care. Simulation-based training is shown to be an effective method of education when applied to the deteriorating patient (Bogossian et al., 2015; Cooper et al., 2015). This desktop simulation exercise had complied with a high-fidelity factor due to its creation from a real–life MET call. The following provides some of the feedback from the use of this simulation exercise.

> *This is an interesting way to learn because it is based on a real-life scenario. You feel as if you are in the situation, without having the fear of getting it wrong. It feels controlled (P 18).*

The feedback from the participants was encouraging, indicating the VPS was not too difficult or patronising, and yet at the same time they felt the VPS had a great sense of realism. The participants had noticed the deliberate mistake when delivering the staggered release of the physiological parameters: having the EWS wrongly scored. This was owing to a miscalculation of the EWS score, as this occurred in the real–life MET call. The outcome of this MET call is potentially a life-threatening event due to several reasons. The miscalculation was a major contributing factor to this incident, as indicated in the investigation report completed by the Trust.

The simulation had been created as a desktop exercise. The participants felt relaxed in this environment, knowing this was a learning experience, as well as a research method used to explore the concept of their patient assessment process. They all described the experience as being supportive and non-threatening. Although many of the participants had never taken part in a simulation exercise before, this encouraged

them to engage with this method of education in the near future, as they felt this was a positive experience which enhanced their knowledge and skills in dealing with the deteriorating patient, as illustrated by one of the participants:

> *It's a brilliant way to teach and learn about the deteriorating patient. We should have lots more of this as it's different when you go over to the simulation lab. You feel the pressure is on, when you are in front of people, which really makes me nervous, so you don't take most of its in. This way, it's a lot easier and less stressful (P 20).*

It was interesting to hear the positive comments from the participants. The delivery of the simulation was attributed to their colleagues, who had completed the first phase of this study. Without the discussion and co-construction of the concept of this simulation, the outcome of this exercise may have been altered. The fact this concept had been co-constructed with the Phase One participants makes this exercise unique, enhancing its own authenticity. The next section presents the findings from Phase Three: focus groups, including some feedback from the VPS.

5.4 Focus groups

This section presents the highlights of the findings from the four focus groups. Due to the richness of the data from Phase Two, this generated discussion of the clinical detail relating to the VPS. The participants fashioned the group discussion as peer review sessions. The discussions contained comparisons of each other's actions, thoughts, beliefs, experiences, plus their recognition and response to patient deterioration. Questions to generate the discussion were used as a guide (see Box 3, p 104). Most of the discussions developed their own momentum, highlighting details surrounding the recognition of deterioration, intuition, Trust infrastructure, litigation, escalation of care, and their emotions associated with this process. Figure 9 illustrates the themes generated within the group discussions.

Main themes		
1.Packaging deterioration to medical staff.	**2. Intuitive knowing.**	**3. EWS – a blessing or a curse.**
Subthemes	**Thematic linkage to main themes**	
1. Organisational culture.	Packaging deterioration, intuition, EWS score.	
2. Pattern recognition.	Packaging deterioration, intuition, EWS score.	
3. Experience.	Packaging deterioration, intuition, EWS score.	

Figure 9: Main themes and subthemes constructed in Phase Three

5.4.1 Focus Group (A): pattern recognition

As the first focus group (FG) session began, I was mindful to guide the discussion and not create it. I identified this as a potential pitfall to avoid, as the aim was to craft a co-constructive account of this experience. In addition, I became aware of my responsibility in leading the focus group sessions, ensuring that all members had equal involvement within the discussion, including myself, and that the environment remained informal and confidential. All members of the groups expressed their views of the VPS in terms of its construction, realism, practicality, and the method of delivery. I decided to report their collective evaluations of the VPS at the end of each FG section, as this may have dominated the data reported. The following paragraphs will highlight some examples taken from the group discussion to illustrate the latter points, starting with Group A (see Table 23).

Focus Group	Participants' time spent in clinical practice	Characteristics
Group A: **P 31** **P 35** **P 38** **P 44**	**6 Years** **11 Years** **13 Years** **23 Years**	**Medical = 3** **Surgical = 1** **Male = 1** **Female = 3**

Table 23: Focus Group A

One of the members offered to begin the discussion as she wanted to highlight to the group a recent experience, she had encountered on the ward to gain insight into the other members' thoughts and actions related to the situation. The simulation had prompted this thought process, recalling this memory of a previous patient to

retrospectively validate her own actions. The remaining members of the group agreed to this request, as follows:

> *I had a lady, who was feeling dizzy and sick and complained of a headache. I had nursed her over the past few days, so I noticed this change. I contacted the doctor, an F1, he said, 'Just monitor her'. I said, 'No, this lady is not right. I would like you to see her.' An hour passed. I returned to this lady, and her symptoms had worsened: her GCS was 15/15 and EWS 3. The F1 was on the ward, and I asked him to review this lady again. He said if he had time, he would. I just knew this lady was unwell. The obs were all fine, but I put out a MET call anyway. They arrived and the CT of her head revealed a large subarachnoid bleed. She was blue-lighted over to a specialist neuro centre. I just felt numb. The medical registrar said to me: 'Well done for sticking to your guns.' Has that happened to any of you? (P 35).*

The other participants related to the above situation immediately and suggested from their experiences they would have followed a similar action plan. They explained, once you have discussed this with the junior doctor, if you are still concerned you need to escalate to their seniors, as they may also be out of their depth in dealing with a situation like this.

> *I wouldn't just take the F1's word, I would let the SHO or even the Reg know. But you did the best thing, acted on your hunch, and put out a MET call. You saved that patient's life (P 44).*

> *It really annoys me to think we must practically beg to get a doctor to see a patient. What do they think we are on the ward for? We are professionals in our own right. I blame the culture in the hospital, setting up the EWS call criteria of 3 or above. They can get out of it too easily, leaving us to blame for not contacting anyone to review the patient. Well done, I would have done the same (P 38).*

> *Do you think the FY1 had similar feelings in relation to escalating to his senior? He also may feel unsure and does not want to risk looking foolish to his seniors (Researcher).*

The other participants agreed with the above and reiterated the fact that this should be more reason for the junior doctor to discuss with his seniors, to escalate the patient's care appropriately. This discussion was cyclical, involving all the participants. They emphasised their emotions of fear, loss of control, anxiety, uncertainty, and some mentioned their lack of confidence in assessing patient acuity. The latter stemmed from their collective experiences. The participants' lack of confidence resulted from the disregard from some of the doctors in relation to their clinical assessment of the patient. It was interesting to listen to the participants supporting each other in their decision – making and displaying empathy to each other, explaining how they had dealt with similar situations. According to the participants, their discussion focused on the doctors' perceived lack of the nurses' clinical credibility to assess health deterioration. They explained that this reduces their level of confidence, which leads to them feeling unsupported by the organisation in terms of the escalation policy. When asked for their opinions of why this would be so, their response was as follows:

> *I think it's cos you know the patient, and you can't put your finger on it, you just know, something is not right. It's back to intuition again (P 31).*

> *The medical team training is far more in-depth than our training, and sometimes they make you feel stupid, as if you don't know anything at all (P 38).*

The remaining members of the group agreed with this statement. All four participants held strong views regarding the lower breach threshold of the EWS system, which they believed played an integral part in this non-belief of their assessment, hindering the escalation process. In contrast, the high numerical score facilitated this process. The participants explained further that more simulation training is needed to enhance nurses' understanding of patient deterioration delivered through a non-threating medium, such as the VPS. This method of education had conjured up mixed emotions, opinions, and discussion relating to the recognition and response to patient deterioration.

5.4.2 Focus Group (B): experience

The next focus group (see Table 24) exhibited parallel views when compared to those discussed in Group A. The Group B discussion took a slightly different stance in the sense that three group members concentrated solely on the VPS to project their views and opinions, whereas the remaining participant relied upon her own experience. This was very noticeable and different from the previous group, so I enquired why. The participants replied:

> *I deal with this type of patient all the time, so I am confident in my own practice as a haematology nurse. For me I find it easier to relate to my own clinical practice, rather than the simulation, although I think it's really good way to learn (P 32)*.

The remaining three group members agreed with the latter. They reviewed each stage of the VPS in detail.

Focus Group	Participants' time spent in clinical practice	Characteristics
Group B: **P 36** **P 46** **P 40** **P 32**	**9 years** **25 years** **10 years** **5 years**	**Medical = 2** **Surgical = 2** **Male = 1** **Female = 3**

Table 24: Focus Group B

All participants concurred that the clinical information related to neutropenic sepsis. Three of the group members were not aware of the meaning of "neutropenic sepsis," although associated this effect to receiving chemotherapy. Likewise, they were not familiar with chemotherapy. The members of the group were using pattern recognition and their own familiarity with the medical condition, as most had previous experience in dealing with these types of patients. The haematology nurse gave a brief overview of both neutropenia and the causative effects of chemotherapy, leading towards neutropenic sepsis:

I have nursed patients with neutropenic sepsis. I know it's because of the chemo, but I don't know why (P 40).

I had a feeling it was neutropenic sepsis, because of the chemotherapy. I know these patients are susceptible to this (P 46).

I have seen these patients go off big time (P 36).

More crucially, all members had recognised potential health deterioration at an early stage. Three of the members, as discussed, had no prior knowledge of either neutropenic sepsis or the effects of chemotherapy. They based their decision on previous experience and recognising the symptoms from those patients. They were seeking validation of this point through the collective discussion, and comparing thoughts, emotions, actions, and decision–making. All seemed pleased with the result of the discussion as this aided their understanding of why they recognised this patient's potential for health deterioration and commented this clarity would aid their future assessments of these patients. The group members moved forward to discuss issues relating to the barriers of this process, which were similar to those identified by Group A: confidence and competence to escalate the patient to their seniors. However, lack of faith within the Trust's patient safety system featured with high frequency during this discussion, as follows:

The EWS system is good when you have a patient scoring high. It's easy. The problem is when the score is low and the fact is, I get tongue-tied when trying to explain… to be honest it's exhausting (P 36).

It's not just the EWS score that should be important. We are experienced nurses. The doctors really should trust our point of view. When you try and explain about your patient concerns, sometimes they look at you as if you're mad (P 40).

Have you all heard of Dutch-Early-Nurse-Worry-Indicator-Score (DENWIS)? This is a similar system to EWS, numerically. This score is calculated independently then added onto the EWS score, inflating the score, and in turn increasing the threshold for a patient review or activating a MET call (Researcher).

The participants were interested to learn more in relation to the (DENWIS) scoring system. They were signposted to read the research article. The discussion continued in relation to the patient safety culture within the Trust. The participants viewed this culture as blaming and potentially damaging to nurses' confidence. They explained that every MET call, cardiac arrest and EWS breach is investigated internally through the Datix reporting system. The group felt this system is one of the reasons the nurses have difficulties on the wards:

> *The Datix describes the incident that has taken place, failing to mention the influences from the environment, staffing issues, and other untoward incidents happening at the same time on the ward (P 32).*

Trust management views this with accuracy and precision, according to the participants:

> *The managers tell you the Datix is your safety net. They say there is no blame culture. The minute something goes wrong they are looking for someone to take the blame (P 40).*

The more concerning aspects of this discussion focused on how the participants described their feelings and emotions in connection with this system. All the participants recalled feeling anxious, fearful, and worried which, in turn, affected their confidence when dealing with the deteriorating patient.

This focus group unveiled some of those factors already identified within the study and portrayed them in a different light, adding more narrative supporting their presence. This facilitated a detailed explanation that enriched a collective understanding of these issues. This group was very complimentary of the VPS exercise. As other groups mentioned, this gave the participants a chance to openly discuss their experiences with other nurses who shared this experience.

5.4.3 Focus Group (C): organisational infrastructure

The dominant discussion was focused on issues relating to the recognition of patient deterioration. All members of the group (see Table 24) were actively involved within the discussion as follows:

Focus Group	Participants' time spent in clinical practice	Characteristics
Group C: **P 33** **P 42** **P 45** **P 37**	 **13 years** **16 years** **19 years** **22 years**	 **Medical = 2** **Surgical = 2** **Male = 1** **Female = 3**

Table 25: Focus Group C

> *My concern is his tachycardia and his obvious neutropenic sepsis. He has a management plan in place for the sepsis, but we haven't dealt with the tachycardia (P 45).*
>
> *I am a surgical nurse, so my knowledge of neutropenic sepsis is limited, but I know how to recognise sepsis and know how it's treated. I would be concerned about his fast pulse, and I would want him reviewed by the doctor. If the FY1 or SHO can't see him, then I want a Reg. I have seen how quick these patients go off (P 37).*

The participants detailed their recognition skills and all four would escalate this patient based on experiential knowledge of the symptoms and, more importantly, the outcome of the situation. The discussion then linked to the reasoning as to why his blood pressure would have dropped so markedly. Interestingly, although none of them offered the correct explanation for the decrease in blood pressure, they were aware of its concern. This would be the basis for a medical review, based upon their experiences:

> *It's scary what can happen. That's why we need to be on the ball all the time and the doctors should listen to us more (P 42).*
>
> *This is someone's life we are talking about here, let's not mess it up (P 33).*

An interesting point of note is the lack of awareness for the physiological decline in the patient. Although the participants had recognised deterioration and the need for this

patient's care to be escalated, they had difficulty in communicating this to the medical team owing to their lack of theoretical knowledge of what sepsis is. The participants related this recognition to their intuitive and experiential learning, as illustrated:

> *I have seen these patients go off quickly, the blood pressure drops. They have high temps, due to the infection. But I don't really know why the blood pressure drops. No one has told me, really (P 45).*

Some of the participants related the ease of this recognition process to knowing the doctor and being familiar with each other's ways.

> *If you know each other, you just ring the doctor and just say he is unwell, his BP is dropping do you want fluids, he looks septic. The doctor normally would respond by saying yes give him fluids. I'll write them up when I get there, so you have trust in each other (P37).*

As the discussion continued, they all had examples to offer each other and then collectively made assumptions themselves as to their reasoning for not selecting a theoretical knowledge base to aid their decision-making. They concluded that theoretical knowledge is not needed in this situation due to the fact the patient would be reviewed. The group felt this alone may not offer more in terms of the review. Other factors, such as knowing the doctor or a high EWS score, would be more likely to result in action and prompt a further review.

Continuing with this theme, the discussion led to litigation. One of the participants led the discussion, describing her feeling of fear and anxiety surrounding the litigation process. During this discussion, she asked the group for clarification surrounding protection from litigation in terms of Trust policy. The group replied with a variety of explanations from medical negligence to vicarious liability. The latter had been described as a situation in which a person or organisation could be partly held accountable for a person's action.

> *I find this frightening, cos you don't know when this could happen, and this could happen to anyone though (P 33).*

This is why policy and procedures are important within the Trust as they protect you in a vicarious liability situation. If you do not follow policy and procedure, it is difficult to prove your stance of protection (Researcher).

This discussion continued; the participants were comparing their experiences of near misses of Trust litigation when dealing with a deteriorating patient. This produced more anxiety and concern. Further discussion gave the group members reassurance in terms of guidance of appropriate action to take in this situation. The most important action to take is to formally document the conversation and to use the Datix system if you reach a disagreement with the doctor.

The participants felt the discussion was helpful and this had clarified some ambiguity surrounding litigation. All the participants concluded the VPS had been a useful exercise, especially owing to the delivery from a one-one perspective. They felt this method was preferable than attending the simulation suite. This method included a small, discreet audience. If errors occurred, they would feel less embarrassed compared to completing the exercise with a larger group of people.

5.4.4 Focus Group (D)

This group discussion followed a similar trajectory to the other three groups in terms of what had been discussed, such as intuition, recognition, the EWS system, and response. However, when the discussion reached the stage of response/escalation of care, two schools of thought co-existed in relation to their perceived confidence and experience. It has been argued that, during the time spent in clinical practice, confidence is cultivated with exposure (Benner, 1984). However, this appears not to be the case in this instance; the most junior colleague in terms of time spent in clinical practice within the group appeared more assertive than the other three group members: as demonstrated by the following exemplars:

Focus Group	Participants' time spent in clinical practice	Characteristics
Group D: **P 34** **P 39** **P 41** **P 43**	 **12 months** **4 years** **7 years** **14 years**	 **Medical = 2** **Surgical = 2** **Male = 0** **Female = 4**

Table 26: Focus Group D

I have seen neutropenic sepsis lots of times and I have seen the possible outcome of a patient going to ITU, so I wouldn't have any problem in escalating the patient with a EWS of 3. If they didn't come to review when asked, I would put a MET call out (P 43).

It's easier said than done, getting a review. If the doctors delay, I would also put a MET call out. I think you're right really (P 34).

I wouldn't wait for further problems; I would just put a MET call out (P 41).

As the discussion continued, the points raised in relation to confidence became even more focused. Participants 43 and 41 viewed confidences as being developed through years of clinical exposure in practice, whereas the remaining two participants (P 39, and P 34) disagreed. They explained that confidence when looking after sick patients comes with numerous exposures to the clinical symptoms and conditions, not necessarily with years of practice. The latter argument is based upon pattern recognition, looking for similarities between the patient's conditions (Dreyfus and Dreyfus, 1980). However, P 34 and P 39 disagreed, due to the fact these symptoms could be present in many underlying conditions, not just neutropenic sepsis. At this point, I offered a possible neutral ground explaining the importance is the recognition and your response at this time, not the differential diagnosis. Both parties agreed to disagree:

For instance, I could have been in nursing for say 18 years, but never come across a sick patient, or I may object to looking after such a patient because I lack that experience (P 39).

I am fresh out of university so during that time I had exposure to specific training in looking after the deteriorating patient, and I have had a lot of experience of sepsis working on a respiratory ward. So, I would say I am confident to place a MET call if needed (P 34).

The direction of the discussion digressed slightly, becoming a dispute regarding the exposure to patient deterioration. The experience in clinical practice in terms of years does not necessarily equate to exposure to the deteriorating ward patient. I could see

both sides of the argument, as time spent in clinical practice develops skills and knowledge to combine and package to a doctor with confidence. In addition, numerous exposures to acute clinical situations could equally give the essential background to enhance confidence in your decision-making ability.

The participants were describing two schools of thought, unknowingly, based upon incremental skill performance as a direct result of the accrual of experience and education. Education in this sense would be related to repeated exposure to dealing with deteriorating patients, the manifestation of the patient's symptoms or changes in the patient's behaviour. This may encompass their intuition aiding their escalation response. The following gave some closure:

> *I believe, equally, you are discussing very valid points. It's interesting you mention these points, such as the nurses' confidence when dealing with a deteriorating patient. This had little coverage within the literature. The issue of confidence has been raised throughout this study, and I agree with all of you. Its impact is underreported and its significance in this field of inquiry is not recognised (Researcher).*

> *This makes sense to me as, I suppose, a new staff nurse, compared to the group. The ward I am on deals with acutely ill patients with lots of co-morbidities, so I suppose they are more likely to become ill, aren't they? (P 34).*

> *Ok, got it. I understand now this has been explained in more detail to me (P 41).*

> *Yes, that does make perfect sense. That's fascinating really (P 39).*

The participants respected each other's points of view and ended the discussion with the knowledge that ward nurses are not required to establish the differential diagnosis. Their responsibility is to seek medical advice and to respond appropriately. The group agreed that health deterioration of patients could present in many forms and, as nurses, we play a fundamental role in health surveillance of our patients. Therefore, it is essential we continue to escalate our concerns in a timely fashion, as this is shown to beneficially affect patient outcomes.

The group felt the VPS was successful and was a unique method to develop skills and knowledge of the deteriorating patient. With the VPS modelled on a real-life MET call, this added a sense of realism. However, this group was impressed with the group discussion. According to the participants, they learnt a great deal from each other. They found the open discussion about recognition of health deterioration, confidence, experience, and specific knowledge to be valuable for the future when dealing with patient deterioration.

occurrence and their relationship to the main themes as reported within all three phases within the study.

5.4.5 Subthemes

The subthemes, comparable to the main themes, remained consistent throughout the three phases of the study, providing a thematic linkage. Several the subthemes were re-defined and distributed between the overarching main and subthemes due to their potential duplicated meaning to others. This process was replicated for all subthemes identified within each phase, this was completed for clarity of reporting (see table27)

Original subtheme	Re-defined and clustered into
Pattern recognition	Intuitive knowing
Workload	Organisational culture
Recognition of problem	Packaging deterioration
Anxiety	Confidence

Table 27: Subthemes re-categorised

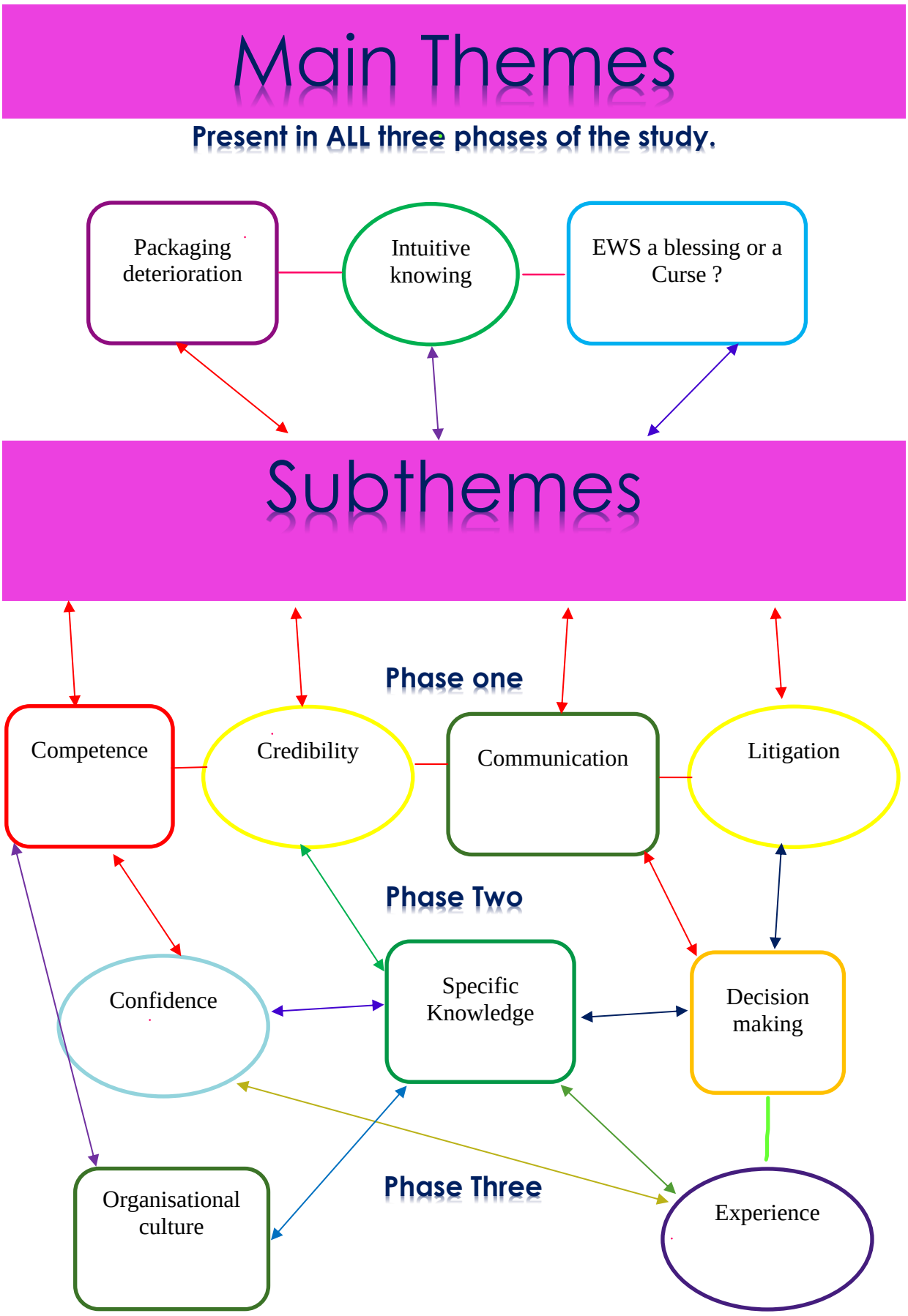

Figure 10: Illustrating the theme development within each phase.

5.5 Summary

This chapter has presented the findings from the three phases of data collection within this study, from a mixture of in-depth interviews, simulation exercises, and focus groups, involving 46 participants. The findings from this study have provided insights of nurses' assessment of patient acuity and their response to acute deterioration, identifying factors that influence this level of practice, which were perceived to either encourage or inhibit the escalation process of patient deterioration. The use of intuitive and experiential knowledge to inform this level of practice was widespread, with the absence of theoretical knowledge evident. The early recognition of health deterioration was a significant finding, demonstrated as the participants navigated through the five stages of the simulation exercise. Other significant findings were the level of confidence of the participants; this was discovered to be an influencing factor in the recognition of health deterioration and the escalation of care. In addition, there was over reliance on the numerical EWS system demonstrated by the participants to provide evidence to highlight health deterioration. Moreover, establishing an elevated breach of the scoring threshold simplified the escalation process, versus, a low threshold breach becoming more complicated owing to the subjectivity of the nurses' assessment. Elements of the patient safety infrastructure also featured highly in relation to the above processes. The next chapter presents an in-depth discussion of these findings in conjunction with the related literature.

Chapter: 6 Discussion

6.1 Introduction

The research question was to explore whether nurses are missing cues of patient deterioration, as reported. Therefore, the aim of this study was to understand the process of nurses' recognition and response to patient deterioration in more detail. The previous chapter presented the findings of this study. Three main themes and several sub-themes emerged within all three phases of this study. The subthemes were condensed further for ease for reporting, as demonstrated within the previous chapter. Therefore, the following themes were reported as factors that influence this level of practice:

Main themes:

- ***Packaging deterioration***
- ***Intuitive knowing***
- ***EWS – a blessing or a curse?***

Subthemes:

- ***Confidence***
- ***Competence***
- ***Clinical credibility***
- ***Knowledge***
- ***Experience***
- ***Decision-making***
- ***Organisational culture***
- ***Litigation***
- ***Communication***

This chapter will present the discussion of the findings as derived from all three phases of this study, blending the literature and the theoretical frameworks used to assist the understanding of the processes involved. The first part of this chapter will highlight a

summary of the key findings before moving forward to discuss the findings associated with the main and subthemes.

6.2 Summary of key findings

The findings of this study indicate ward nurses experience significant clinical, emotional, organisational, and system barriers in relation to the recognition and response to patient deterioration. These challenges continue to exist, despite best efforts of the strategies employed to assist this level of care (Hogan et al., 2019; Connor et al., 2021; Dresser et al.,2023). Negative emotional responses were identified within this study, which duplicated some of those found within the literature. Others had little exposure within the literature, such as the Trust infrastructure and governance provisions. which either hindered or promoted the response (Cioffi, 2000; Endacott et al., 2007; Chua et al., 2013; Azimirad et al,.2020; Smith et al.,2021).

Contrary to what the literature has reported, the participants within this study demonstrated early recognition of patient deterioration in Phase Two (VPS), answering in part the question that I had posed within earlier chapters: 'are nurses missing cues of patient deterioration, as reported?' The participants recognised the physiological changes indicating deterioration and their response became impeded by factors identified within the literature and exemplified within this study.

6.3 Themes and subthemes

The concept of 'recognising' and 'responding' to patient deterioration is derived from the critical care arena, which has been chosen to adopt the use of these terms. Other researchers within this field use terms such as 'failure to rescue' and 'nurses' surveillance capacity' (Cooper et al., 2016). Using a clearly defined definition of deterioration in Chapters 1 and 4, this enabled the participants to focus their reflective experiences needed for the purpose of this study. This also provided clarity to the researcher that all participants possessed a consistent baseline understanding of the meaning of 'patient deterioration,' in addition to their experience. The following paragraphs will discuss the main themes, before moving forward to discuss the subthemes constructed within this study.

6.3.1 Theme (1) Packaging deterioration

This theme was contextualised as grabbing the medical staff attention to escalate the patients care. This took shape in many forms, one being forging relationships with the medical staff either from working closely with each other over the years, or by forming new relationships invariably with the junior medical staff covering the wards. The relationships between the participants and the medical staff were interesting. The medical standing exerted an influence on the participants' decision-making, even though much of this sample were experienced nurses, and ordinarily they would induct the junior doctor into aspects of their discipline (Garelick and Fagin, 2004). This concept was described by Stein (1967) as the doctor – nurse game. The nurse in Stein's time would show initiative, commitment, care, and compassion, while appearing to defer to the authority of the doctor. This was highlighted within this study as some of the participants alluded directly to the doctors' undeniable position in the clinical area. The participants expressed their lack of formal knowledge as being an issue within this relationship, with the majority referring to the doctors' "knowledge being greater than their own."

According to the participants, their lack of knowledge tipped the balance of their relationship, and they experienced the role power exerted by the medical staff. They stated that the doctors hold academic knowledge steeped in historical research forming the foundation of the medical profession. As a result, the medical professional has held an unquestionable position in society and is seen by many as the professional elite. Therefore, the notion of challenging this view is difficult due to the doctor's status (McDonald, 2014; Weber, 1978). Andrews and Waterman, (2005) alluded to the nurses' knowledge to quantify the difference in the patient's status, to persuade the doctor to stop what they are doing and come and assess their patient. They continue to discuss this using the EWS system as their main vehicle to stage the argument. Once the EWS system became raised this would be easier for the doctor to contextualise the information. However, they agree the referral process becomes much more difficult when there is little quantifiable information to process. The latter was experienced by the participants within this study, more so when the EWS score presented low, even though the participants had a strong notion of the patients' conditional changes. This reverts to the use of subjective cues as mentioned throughout this thesis being the main culprit. These cues stemmed from knowing the patient witnessing slight changes within their condition, whereas another professional who is not acquainted with the patient

would potentially overlook these changes. The participants accounted for this in part with their use of intuition, knowing something is not right, and having difficulty to articulate this change owing to its subjectivity. The theoretical frameworks allow for this explanation to become more transparent in the sense of increasing our understanding of intuitive cognition. This perceptual nature of intuition is explained by pattern recognition (Gobet and Chassy, 2008; Eysenck and Keane, 2020) as mentioned within chapter three, the memory is activated from the past situation and brought into the present situation creating a link between both. The Cognitive Continuum Theory (CCT) operates a similar process of activation , through "pattern or similarity recognition." According to Hamm, (1988) the difference is that the main concept of the CCT is the task in hand influences the thinking mode, and it's the pairing of the latter that increases the accuracy of the decision made. Benner's (1984) model would argue differently relying on the subjective nature earned through the years of experience, which also maintains a strong position as most of the nurses' boasted years of experience, and furthermore, recalled their decisions were informed by their experiential learning. The participants within this study were unaware of the reasoning that influenced their decision making to a certain extent, although aware of the difficulty in communicating these conditional changes. A high value was placed on experience to interpret the clinical signs of deterioration as mentioned within the literature, and acknowledged the sensitivity of the EWS system , when registering a low score, as a limitation to package deterioration to the medical staff (Cioffi, 2000; Wheatley, 2006; Mc Donnell et al., 2013; Smith and Aitken, 2016)

Due to the clinical urgency of most of the MET activations nurses communicate normally over the phone to alert the medical staff of the patient condition. A high percentage of serious adverse events occur during this information sharing (Haig et al., 2006). Therefore, a suggested solution proposed was the SBAR tool as mentioned within the literature review chapter. This is widely used within the UK and was implemented in 2015 by many of the Trusts (Hogan et al,.2019). This was reported as being sparse in use within my study and having the opposite effect to those who are tasked to apply this in practice. As highlighted by the participants' the SBAR tool resembles a mini clinical examination, which they felt ill equipped to deal with, hence, the lack of up-take.

In Azimairad et al., (2020) study, they reported several nurses being reluctant to activate a MET call due to fear of criticism by the medical team. Over half of the English nurses within their study, would activate the MET team response for inadequate patient

management by doctors. As an interesting contrast the Finish nurses were more likely to hold off calling the MET team as they felt more in control of the situation. However, one of the main themes that emerged from this study was that more than half of the sample (n=198) perceived the doctors influence was a barrier to escalation. This was in terms of them exerting their dominance of knowledge to counteract their patient review. In Chua et al., (2020) study, the team reported the use of a similar system to SBAR called ISBAR, Identify, Situation, Background, Assessment and Recommendations. In their study the nurses felt their communication was of good quality using this tool. However, the medical staff within the same study conveyed a different message, stating the nurses would often lack saliency and were long-winded, plus unable to articulate the problem. Many of the doctors recalled nurses calling them without a sound knowledge of the actual problem or the patient's background. They felt this would further delay the escalation of the patients care, posing a greater challenge for the on-call doctors, who would usually lack the understanding of the patient's condition owing to the nature of being on call covering wards other than your own, often lacking familiarity of those wards and the specialties. The nurses described they faced fear of being criticised by the doctors when escalating the deteriorating patient, owing to feeling clinically inadequate, seen to be asking stupid questions, being intimidated by the doctor's knowledge and power they hold.

According to Creed et al., (2010) and Luke (2003), social prestige and status play a vital part in medicine. Researchers have argued that, before the application process of entry into medicine has even begun. the hierarchical status of the speciality choice is being pondered, with surgery being dominant and psychiatry being the end choice (Norredam and Album, 2007). Prestige and status are an essential part of Pierre Bourdieu's theoretical framework, in which he argues that doctors struggle to gain some form of capital (i.e., cultural, economic, social, or symbolic) in order to gain prestige, which is perceived to become successful. In doing so, they compete to gain attractive positions in the medical field (Bourdieu, 1986). Max Weber (1978), a prominent sociologist, highlighted medicine as one of the leading professional groups in society and referred to medicine as being closed to certain social classes. A reason being is that their mode of education is at independent schools, and they have a high familial social status. Weber explained that there are other insights into their cultural capital that reveals the importance of linking class and status when exploring the status and prestige of the medical profession. However, Bourdieu (2013) rejected Weberian notions of class

and status groups as distinct ideal types, but viewed these concepts as inextricably linked. Bourdieu stated the medical profession is a world of its own, where investments and power struggles are what count within the profession. He regarded this profession as a field of power.

The apparent subservience observed by Stein in 1967 remains relevant within today's nursing world, as alleged by the participants. The medical profession contains a powerful and elite group of skilled practitioners. This remained unchallenged until the introduction of Advanced Nursing Practice roles (NMC, 2018; RCN, 2018). These roles promote cross-boundary working, replicating work previously completed by doctors which has evolved, expanded, and undergone transformation to become inclusive within Advanced Clinical Practice, which is defined as:

Experienced, registered health and care practitioners deliver advanced clinical practice. It is a level of practice characterised by a high degree of autonomy and complex decision-making. This is underpinned by master's level award or equivalent that encompasses the four pillars of clinical practice, leadership and management, education, and research with demonstration of core capabilities and area specific competence (Health Education England (HEE), 2017, p. 8).

The challenges the NHS are facing are inherent to an aging and expanding population with more complex needs, the burden of disease, poor staffing levels, the working time directive affecting junior doctors' hours and shortages of general practitioners. These have all been cited as drivers for the implementation of the Advanced Clinical Practitioner (ACP) (Gloster and Leigh, 2021). In 2017 the HEE published a multi-professional workforce framework, which set out a new and bold vision in developing new ways of working. The rational for this change was multidimensional, as mentioned above, with the main drivers being the significant concerns about the quality, safety, and delivery of care in some settings, as identified within the Francis report (2013). In some respect for those ACPs who derive from a nursing background, this new level of working is challenging, which has re-modelled our thinking and the relationships developed with the medical staff to become their peers, altering the power shift of the relationship.

6.3.2 Theme (2) Intuitive knowing

Intuition was identified as the most common process to trigger recognition and expressed within all three phases within this study. The use of intuition by the participants

was conceptualised by having a 'sixth sense,' knowing that something is wrong with the patient, claiming an inability to either describe what that 'something' is, to secure a medical review for the patient. Intuition is characterised by rapid perception and the grasp of the situation, a lack of awareness of the mechanisms leading to an action and emotion (Benner 1984; Gobet and Chassy, 2008). This is claimed to be learnt through the experiences of nurses' daily activities, created automatically and unconsciously (Gobet and Chassy, 2008). Carnevali et al., (1984) and Cioffi (1997) suggested that there is uncertainty in how intuition is activated, and it is known that nurses utilise different strategies, which contribute to how they arrive at an intuitive judgement. Nurses are exposed to other people's perspectives and opinions; this process is known to be convoluted (Carnevali et al.,1984; Cioffi, 2010).

It became evident the participants were dependent on their experiential knowledge to inform their recognition of patient deterioration, and their decision-making. This was associated with knowing the patient. Ward nurses are ideally placed to recognise and respond to patient deterioration, through knowing the patient and collecting vital sign data to inform their assessment process. Knowing the patient is known to contribute to a positive patient outcome. In this study, the participants laid claim to this concept when describing their caring experience. They argued that the repetition of nursing care and their daily interactions helped create knowledge of the patient's response pattern, developing a sense of knowing the person, which enabled advocacy as suggested by Tanner and Hughes (1984).

Radwin (1995) conducted a literature review and identified that knowing the patient was subdivided into two components: "the nurses' understanding of the specific patient, and the nurses' subsequent interventions". This is acknowledged as a subjective process and linked to the humanistic-intuitive approach as described by Benner (1984), where the decisions are primarily based within the subjective domain, utilising a combination of both intuitive and experiential knowledge to elicit clues of clinical deterioration through the process of knowing the patient. The participants within this study claimed their clinical based decisions are derived from intuition informed by their clinical experience, which corresponds to the literature describing the use of intuition within clinical practice (Cioffi, 2000, Andrews and Waterman,2005; Parkhide et al., 2016; Melin-Johansson et al., 2017).

The use of clinical cues to detect patient deterioration within the literature is vague, and this was reflected within this study, with the participants commenting on the look of the patient, behaviour, and their communication strategies. This raised further questions in relation to the validity of these cues as they are recognised but not valued. Anecdotes are reported within the literature as isolated cues linking to patient deterioration, with no descriptive measures of their meaning or significance, making this difficult to place into the overall context (Cioffi, 2000; Minick and Harvey, 2003; Cox et al., 2006). However, if the vital sign data were positive, for example a high temperature and / or low blood pressure, these cues would be interpreted with different meaning suggesting signs of clinical deterioration.

The subjectivity of these cues mentioned have long been debated and are influenced by numerous factors, with clinical experience is one of those identified (Hoffman et al., 2009; Aitken et al., 2011). As more data are collected, a trend becomes evident, encouraging the nurse to revert to objective measures and monitor changes in the patient's health status (Massey et al., 2014). The objective findings of the EWS system were used by the participants within this study to activate the response needed (Felton, 2012; Dalton et al., 2018). More experienced participants were more likely to activate EWS due to their clinical concerns of the patient, not necessarily due to the elevated score. This was illustrated in the studies of Hoffman et al., (2009) and Aitken et al., (2011), demonstrating their accuracy in using cues to validate their suspicions before activating a response, corresponding with the other authors in this field (Andrews and Waterman, 2005; Ludikhuize et al., 2012). In this sense, there is a fluid action observed as the participants move along the cognitive continuum towards the analytical elements of the decision-making process. This will be discussed further on within this chapter.

Burden et al., (2021) conducted a literature review to examine the use of clinical cues by nurses to recognise deterioration. Their findings concluded 173 clinical clues were identified. They discovered nurses were tailoring their assessments due to the missing data of specific vital signs, for example respiratory rate or cogitative function. This concept has been acknowledged previously within the literature, although its reasoning remains unanswered (Ludikhuize et al., 2012). The subjective cues highlighted within the review by Burden et al. reported on-going clinical symptoms of a condition, for example nausea, dizziness and so on. Within the study, it was difficult to assess if these symptoms were conditional changes identified or red flags of clinical deterioration. The

latter was not supported by any narrative to suggest their significance to the overall clinical picture of deterioration but earned the label as 'cues' of deterioration.

Conversely, Douw et al., (2015) reported 10 general indicators of clinical deterioration reflecting the subjective (intuitive) nature of nurses' worry or concern, recognising the value of these cues. This research study progressed using the same indicators; they developed the Dutch-Early-Nurse-Worry-Indicator–Score (DENWIS) (Douw et al., 2016). The 10 indicators were reduced to 9, with the overall outcome allowing the fusion of both EWS and DENWIS scores within the assessment process to clinically indicate health deterioration. The combined use of each score elevates above the breach threshold, giving these 'subjective cues' a function within the recognition process. The papers reflect their research generated solely within the surgical domain, as there is no mention of other clinical domains such as medicine within these papers. One could argue these cues would present more acutely in medical patients owing to the differences in co-morbidities of medical versus surgical patients, and elective versus acute admission to hospital.

The use of cues within this study remained ambiguous throughout the three phases. They relied upon various strategies to obtain clinical information, and claimed by knowing the patient, observing subjective cues, reviewing previous vital sign data; this enabled the participants to assess the patient more holistically. This claim is supported by the literature advocating that the combination of these strategies enhances the recognition of deterioration and promotes safe care (Chua et al., 2013; Massey et al., 2014; Burden et al., 2021).

Intuition in clinical practice is quite a complex process and, as mentioned, is often endorsed by nurses as the foundation of their patient assessment. Therefore, to understand this we need to examine the decision-making process, considering the theoretical frameworks selected for use within this study. Historically, clinical decision-making in nursing has been discussed considering systematic-positivist models, as discussed in previous chapters (Benner,1984; Hammond, 1967; Thompson, 1999). However, since the late 1990s, a third approach to decision-making has been discussed in the nursing literature, based on the Cognitive Continuum Theory (CCT) (Hamm, 1988). The next sections will briefly explain the interpretation of these selected theories in relation to the findings of this study to illustrate this convoluted process, starting with Benner's theory and concluding with the CCT.

According to Benner's theory, intuition is developed with experience, therefore the rich clinical experience fosters a type of practice wisdom specific to nursing that cannot be 'objectified by science' (Connor et al., 2021, pp. 7-9). This accrual of experience is aligned to this theory when considering the foundations of what we understand intuition to be (Parkhide et al., 2016; Melin-Johansson et al., 2017; Dresser et al.,2023) and therefore relevant to this study as the majority recruited boasted years of experience.

Benner's (1984) research involved recall of previous clinical experiences, which assisted an intuitive response using pattern recognition, although this was not very well defined within her study, and as a result the currency of this work has been challenged. The main criticism of Benner's model appears to focus on the intuitive nature of the 5th stage – expert practice, where the expert practitioner could make autonomous decisions, through the accrual of experience and intuitive knowing. The critics of this model describe the lack of clarity and justification of the "expert," thereby arriving at the debate as to the nature of intuition being innate, or whether the concept is a mystic one (English, 1993; Paley, 1996). However, as mentioned in chapter three, cognitive psychology offers an alternative understanding of intuition, suggesting, intuitive cognition is one of two types of unconscious processes utilised in reasoning and decision making, and has been described as situational pattern recognition (Evans and Stanovich, 2013; Patterson et al.,2017). Intuition is linked to emotions according to Bowers et al (1990, p 82) the unconscious mind sends signals to the conscious mind activating an emotional response from a situational cue, which in turn retrieves an answer from memory from previous experience, this process is termed as pattern recognition (Paterson et al.,(2017).

The participants discussed this process of pattern recognition within all phases in this study, without having a rationale of its reasoning, being ambiguous in nature. A participant was asked to comment on her initial thoughts and feelings, from her patient assessment, and when probed deeper her initial "gut instinct" was recalled from a similar situation involving a patient with a post-operative bleed, requiring an urgent transfer back to theatre. Although, she had recognised a potential problem with the patient's health state, I was interested to explore why at this point she immediately recalled the post-operative bleed, as there are other differential diagnoses that could account for these changes. She explained it was her familiarity from previous experiences that was the driver for this decision. It was also noted her interpretation of the vital signs was accompanied with little knowledge of the reasoning as to why the

deviational changes were present. She relied on her clinical experience to inform this decision whilst using the objective data to validate her thoughts, which is synonymous with the application of pattern recognition (Benner, 1984; Massey et al., 2014; Dresser et al.,2023). The evidence to support this theory has descended from the Natural Decision-Making literature (Klein et al.,1995, Klein,2008). Where, it is suggested the perception of intuition is explained by pattern recognition (Gobet and Chassy, (2008, p 134), which enables long -term memory to be accessed rapidly. This facilitates a cue to be recognised within the long-term memory flagging a similarity of the situation, which stimulates an action, or resolution of the problem (Eysenck and Keane, 2020). In some instances, the use of intuition was portrayed as a negative connotation due to its subjectivity and being unable to package deterioration to the medical staff. The participants described how this made them feel, such as inadequate, stupid, under confident and so on. Benner and Tanner (1987), as authors in the field of intuition, would argue that by denying the value of intuitive perception, it devalues the significance of experienced-based nursing practice. This concept has also been endorsed by King and Appleton (1997) and Effken (2001). This issue was raised repeatedly through all phases of this study, suggesting an inherent problem, and associated with a reliance on their intuitive account of the situation.

There is a depreciation of intuition which has been noted within the literature (Endacott et al., 2007; Minick and Harvey 2003; Gazarian et al., 2010), claiming the limiting value of visual patient assessment by nurses as subjective, therefore not dependable for the medical team to act upon. These limitations seem to stem from the medical world. Nurses would argue their assessment also has limitations due to its subjectivity, however, nurses argue that intuition is based on experience and knowing the patient, recognising a difference in the patient's well-being, and this should be recognised as legitimate knowledge (Minick and Harvey 2003; Gazarian et al., 2010).

The cue recognition insights offered from cognitive psychology has enhanced the understanding of this process. This appears not to be a voluntary / conscious control of processing information, simply an unconscious cognitive process, utilising pattern recognition from similar past experiences. This cognitive function reflects the use of the CCT model in the decision-making process (Hamm, 1988). This theory resonates with clinical practice as this brings together both science and intuition. The CCT is divided into six modes of inquiry, the first stage being analytical associated with science, with the latter intuitive. The main tenent of this theory is the type of task in hand that

influences the practitioner's thinking to 'match the task' which influences the accuracy of the decision made, according to Hamm (1988). However, in time-limiting situations such as urgent care, the time factor alone would compel the participants into a more rapid, intuitive mode of cognition despite where they may consider themselves to be located along the continuum (Hamm, 1988). The participants in this study expressed their recognition of patient deterioration and their subsequent decision-making within the frame of intuition, often explaining several cues observed with these patients and the reliance on their experiences. They relayed information such as having no "*time,*" the patient is "*going off*" suggesting a sense of "urgency," needing to "think" and "act quickly." They described the clinical situations as being unplanned and unexpected, therefore with no type of structure. Consequently, they reported to have little time to carefully assess the condition of their patient. This resulted in them placing a larger emphasis, it would seem, on familiarity strategies, such as intuition. This has been reported by numerous authors, suggesting this is a mechanical process of cognition relating back to the person's 'familiarity,' suggesting a steer towards an inner comfort to seek reassurance (O'Neil, 1995; Saintsing et al., 2011). The CCT theory is indicated for ill-structured, with many cues and little time. Intuition is therefore deemed as an appropriate cogitative mode to use, according to Hamm (1988) and Lamond and Thompson (2000). In summary, the use of these combined theories in acute care assists our collective understanding of why the participants selected intuition. In addition, the theories also demonstrate the complexity faced by nurses within this area of practice and offers a more meaningful explanation of why some of the factors mentioned within this thesis influence the recognition and response process of deterioration.

6.3.3 Theme (3) EWS – a blessing or a curse?

The most common method to monitor a patient's well-being in hospital is vital sign measurement and the EWS system. Nurses are intrinsically part of this process in patient monitoring, and then escalating their concerns (Endacott et al., 2007; Cooper et al., 2010; Smith et al.,2021). This theme was conceptualised as a formula that prompts a response and further described as a measurable, numerical language. The participants were positive about this system as it gave them a sense of empowerment and enablement. Since the introduction of the EWS internationally, this crucial aspect of nursing practice has received little attention compared to studies identifying failure to rescue and proposed recommendations (Liaw et al., 2011). Failures such as system gaps and individual health care errors place patients at risk from harm. Early recognition of

clinical and physiological deterioration is shown to reduce harm and prevent serious adverse patient events (Ludikhuize et al., 2012; Cardona-Morrell et al., 2016), with the implications suggesting increased morbidity, a longer length of stay in hospital and avoidable healthcare costs (Hogan et al., 2019).

According to the participants, vital sign monitoring was viewed as a basic task and allocated to the junior member of the team, usually a student nurse or healthcare assistant. They identified the significance of the vital signs in relation to this process; however, they relied on the person allocated to complete the task to inform them of any deviational changes. They mentioned resorting to task allocation due to the rise in patient acuity, a reduction of staff members on the ward, and not being able to meet the demand placed upon them. The documentation of the vital signs and the importance of clinical judgement were appreciated. However, there was often a delay in data reaching the trained nurse due to the turbulent ward environment. This ritualistic process has been highlighted within the literature, negatively portrayed, and viewed as an important factor in missing vital clues in early clinical deterioration (McDonnell et al., 2013; Hart et al. 2014; Cardona-Morrell et al., 2016).

Once the task was complete, the participants would review each of the vital sign scores given to them, often documenting as they reached each of their patients for varying patient care interventions. The vital sign score was assumed to be an accurate reflection of the patient's physiological picture, implying their reliance upon technology and / or the person preforming the task. This passive process has been highlighted within the literature as a missed opportunity for nurse-patient interaction and viewed as a factor in the delay of escalating care, leading to suboptimal care being provided (Wheatley, 2006; Endacott et al., 2007; Chua et al., 2013; Cardona-Morrel et al., 2016; Minyaev et al.,2021). In recent years, this process has been automated partially due to some of the reasons mentioned, but more so due to the repetition of failure to detect deterioration and the inaccuracy of recording the data (Francis, 2013; Smith and Aitken, 2016; Hogan et al., 2019).

Chua et al., (2013) and Ludikhuize et al., (2012) discovered a lack of documented vital signs preceding a life-threatening adverse event. Similarly, both revealed that vital sign reporting was incomplete; in most cases, the respiratory rate was omitted. This featured within other studies, indicating the perception of Sp02 monitoring as an important indicator for respiratory failure, despite the evidence of respiratory dysfunction being

the most sensitive and earliest indicator of deterioration (Hogan, 2006; Pantazopoulos et al., 2012; Da Costa et al., 2018). This concept was highlighted within this study, as the participants commented during some of the interviews; they were more likely to place an emphasis on the Sp02 monitoring than the respiratory rate. Their reasoning for this was the reliance on the technology to free up time and being less labour intensive, coupled with the urgent need for assistance if the Sp02 level was low. Their analysis of the latter did not consider the potential imposed limitations, such as poor equipment, accuracy of measurement, plus the competence level of nurse / healthcare assistant to interpret the Spo2.

The seminal studies in this field reported tachypnoea (increased respiratory rate) as the most common organ dysfunction, they noted this term was not defined and no values were given to the respiratory rate within their studies, making the judgement difficult of these frequently monitored variables (Schein et al., 1990). Recent studies also suggest there are problems associated with interpretation and confirmability behind the numbers, rather than the score of the EWS itself (Fasolino and Verdin, 2015; Connor et al., 2021). This was observed in Phase Two of this study, as the participants failed to grasp the full picture of the virtual patient's deterioration. They clearly recognised deterioration, but had low comprehension of its reasoning and, more importantly, the potential of its indication. Several participants related the increased pulse to the patient being dehydrated, having a reduction of central fluid. Potentially, this could account for this in some patients; this indication is not corresponding to the overall clinical findings of the virtual patient (Dellinger et al., 2012). The focus of the VPS was a presentation of septic shock, driving the atrial fibrillation causing the tachycardia as previously mentioned (see Appendix 7, p 258; Coppersmith et al., 2018).

The EWS system, according to the participants, was highly regarded if the EWS score breached the escalation threshold i.e., 3 or above, as they were acquainted with the Trust EWS escalation policy. However, when the EWS scored 3 or below they faced difficulties in securing a medical review. The findings demonstrated the frustration and difficulties faced by the participants when attempting to escalate the patient's care to the medical team in this circumstance. The reasons for this were multidimensional, one being related to their intuitive judgement being dismissed as subjective and claiming others as a lack of confidence, poor communication skills, and a lack of physiological knowledge. This situation is common and appears frequently within the literature

(McDonnell et al., 2013; Hart et al., 2014; Smith and Aitken et al., 2016; Azimirad et al.,2021; Burke and Conway,2022). The participants described their reliance upon the high numeracy of the EWS system as this eased the flow of information to activate their desired response. However, as mentioned when the EWS scored below the threshold they experienced difficulties in activating an acute response based on their concerns. Burke and Conway (2022) reported that several studies had found unfavourable consequences when the EWS score was low. The tool was felt by many to be restrictively prescriptive due to its specificity and sensitivity. This became more burdensome when faced with patients with chronic conditions whose normal values, reflected deviation from the normal parameters within the EWS tool. For example, patients with Chronic Obstructed Airway Disease (COPD) as many patients are known to have low oxygen, and saturation levels when measured(Dellinger et al.,2012).

Drawing on different knowledge, experience and expertise is well documented within both paradigms of information-processing and humanistic-intuitive models (Benner, 1984; Hamm, 1988). Despite the influence of Benner's work, historically nursing has used a model of assessment known as the nursing process for prescribing nursing care (Martin, 2017). This model supposes information-processing framed within a problem-solving approach with no allowances for unpredictability, which is inherent within this clinical environment. Faced with this uncertainty plus a patient with complex declining health needs, the nursing decision-making is often made within a rapid timeframe (Currey and Botti, 2006). As a result, they relied on the EWS system, intuition, and experiential knowledge; in most circumstances, they found themselves having to justify their reasoning for a medical review. The majority found this difficult to articulate, and this phenomenon was found to be associated with the differences of their level of experience. Cioffi (2000) and Minick and Harvey (2003) discovered that the more experienced nurses had a deeper reservoir of knowledge and experience to draw upon from a wide data base, enabling them to harness concerns to the patient's condition, recognising cues, and identifying the response needed in a shorter space of time versus their more junior colleagues. This was shown to impact on the participants' emotions, such as their confidence increasing their level of anxiety, knowing that 'something' was wrong with the patient but at the same time being unable to convince the medical team. This has also been portrayed within the literature (Andrews and waterman, 2005; Wheatley, 2006; Chua et al., 2013; Azimirad et al., 2020). In Chua et al., (2022), nurses reported often waiting for the out of hours team to come on duty

before escalating the patients' care, knowing the on-call doctor would have little knowledge of the patient's condition, therefore be less challenging of the review process.

The communication tool SBAR or ISBAR is known for its effectiveness when used between healthcare professionals and is designed to encourage a structured referral of the problem. However, Burke and Conway, (2022) found a lack of discussion from nurses in relation to the use and merits of SBAR, and further reported this was not actively used, and commented that SBAR was subordinate to the EWS system. As mentioned earlier within this chapter, the participants within my own study described the same. Within this literature to date there has only been the voice of the nurse with the difficulties encountered within the escalation process. In Chua et al., (2020) study, junior doctors were also in fear of criticism from the medical hierarchy, especially if they were perceived to activate a MET call which was deemed unnecessary, the fear of looking "stupid" in front of their colleagues made them think twice before calling. The latter is a subconscious barrier caused by this irrational fear of getting it wrong in front of their colleagues. This resonated within my study, as the participants were very descriptive of how this makes them feel, the negative connotations associated with this level of care is extraordinary, and often completely unnoticed. When asked for a possible reason, several of the participants related these feelings to be associated with their intuitive knowing. Due to its subjectivity, some of the participants explained the lack of deliberate knowledge accounts for many of these negative emotions i.e., getting it wrong, feeling stupid (Andrews and Waterman, 2005; Azimirad et al.,2020; Burke and Conway, 2022; Dresser et al.,2023).

The catalyst of their reasoning is their cognitive decision-making, enhanced by the need for rapid decisions within a turbulent environment, 'knowing something is wrong' and needing to escalate their thoughts. During the cue recognition stage, experience allows a more meaningful pattern to emerge, resulting in prompter processing (O'Neil and Chin, 2005). Offredy (1998) observed expert nurses and suggested when faced with a task / problem that became complex and unfamiliar, they would revert to an analytical model of decision-making. It has been concluded that often both analytical reasoning and intuitive approaches are present in nursing clinical decision-making (Hughes and Young, 1990). Moreover, the findings of Offredy's study revealed the lack of formative knowledge in relation to patient deterioration, hence placing their clinical

judgement within the intuitive end of the spectrum along the cognitive continuum (Benner, 1984; Hamm, 1988; Dijkstra et al., 2012; Thompson, 2014; Massey et al., 2014). This occurs for several reasons, namely uncertainty, resolution in a short time frame, and the environmental factors contributing to the ill-structure of the task, requiring a dependency on intuition (Hamm, 1988). This explanation of the use of intuition would sit equally between the CCT and cognitive psychology approach to decision making as the task is ill-structured, recognising a cue, activating the long-term memory, and creating a similar pattern from a previous experience.

6.3.4 Subthemes (1) Confidence (2) competence and (3) credibility

Inability or a delay to recognise patient deterioration exists within the literature, and it is well known that patient safety is compromised because of this delay (Cooper et al., 2016; Dalton et al., 2018; Hogan et al., 2019). The reasons for these delays are poorly understood. The findings of this study add to the existing knowledge within this field of inquiry as the themes identified either promoted or impeded the recognition of health deterioration by ward nurses. The participants' access to support was identified as an important aspect of the management of the deteriorating patient, and this corresponds to the evidence found within six of the reviewed studies (Cioffi, 2000; Andrews and Waterman, 2005; Cox et al., 2006; Donohue and Endacott, 2010; Gazarian et al., 2010; Massey et al., 2014). They often required the help from more senior members of the ward nursing team or the medical staff, and felt more reassured after taking advice, which increased their confidence.

Confidence subtheme (1): The participant's confidence within this study was conceptualised in feeling sure of themselves and their clinical ability to recognise and respond to patient deterioration. Confidence, was highlighted in several studies, concluding that these discussions and collaborative working, strengthened the decision-making process and encouraged the activation of a MET call (Fasolino & Verdin, 2015; Azimirad et al., 2021).Their ability to gain the attention of the medical staff was linked to confidence, experience, and the development of a close working relationship (Massey et al., 2014; Smith et al., 2021; Minyaev et al., 2021) and these issues were emphasised within all three phases of this study.

This feeling of confidence was linked to mutual respect and trust; through knowing each other, this gave the participants the conviction to escalate their concerns more readily. In contrast, not knowing the on-call team impeded this response, which was identified

within a study by Gazarian et al., (2010). The in-service education of the MET criteria was found to either encourage or inhibit their response within this study. As mentioned previously the participants relied upon the EWS system to trigger the response needed to activate a MET call. The inclusion criteria of this study stipulated no recent attendance of in-service education such as ALERT, ILS, or ALS. Again, this may partially account for the above observation, however, the expectation is some residual knowledge may be available from previous training, depending on time of completion. Deliberate education was an important precursor of confidence when caring for the deteriorating patient, this was recognised within the following studies (Cox et al., 2006; Pantazopoulos et al., 2012; Chua et al., 2013; Hart et al., 2014; Azimirad et al., 2020; Burke and Conway, 2022). These studies identified the need for specific on-going education on a regular basis to maintain the skills and knowledge learnt, which enabled the nurses to recognise and respond to patient deterioration in a timely fashion. The level of this education was identified as a significant factor to recognise deterioration, as this assisted the confidence level for those nurses to activate the MET call (Pantazopoulos et al.,2012; Cooper et al,.2013; Dresser et al., 2023). It was noted within my study many of the participants lacked confidence in their own ability plus their knowledge base. When faced with the uncertainty intuitive knowing contributes to the overall decision process, posting the decision maker to the intuition pathway of the CCT (Hamm, 1988; Standing, 2008). The theoretical frameworks employed within this study have assisted this understanding in a broader context. However, if all the participants had received the right level of education would this still be the case? The specific knowledge gained may have boosted their confidence to empower their decision making with more clarity, therefore, not needing to lean so much onto their intuitive thought process, which in turn would have created a more contextual referral to the medical team. Nonetheless, cognitive psychology suggests the recognition of something unusual with the patient promotes a cue which activates the cognitive intuitive process, as described earlier within this chapter (Patterson et al., 2017; Eysenck and Keane, 2020). Emotions were expressed by numerous participants, some of which stems from their lack of familiarity of the emergency equipment needed plus the ambiguity of their role within the MET call. This became known during the interviews when they were openly discussing their emotional responses. Experiencing anxiety, feeling sick, and some recall 'panicking' due to the loss of control and fear of the

unexpected. Further explanations reveal most of these responses were associated with a lack of clarity of their role within the MET call and not feeling competent.

Competence subtheme (2): Competence of the participants was conceptualised as having the ability to do something successful and efficiently, related to the management of the deteriorating patient. The concept of feeling and being competent ensured their confidence, having the recognition of completing a task with high quality outcomes for the patient was important to the participants within this study. When asked the question of why ? many replied they felt accepted by their medical colleagues. Activation of the MET team also challenged the participants competence, as they mentioned they did not really have an allocated role within the MET response. Role definition is identified by the MET team at the beginning of their shift, and they are allocated certain roles prior to attending a MET, such as airway management, compressions etc. This is incorporated as part of the ALS training (ERC, 2021). The ward nurses become engulfed within the situation and are utilised accordingly. These feelings of panic, anxiety, and fear were reported within three of the studies reviewed, resulting from a poor definition of the nurses' role in a medical emergency (Cioffi, 2000; Cox et al., 2006; Massey et al., 2014; Chau et al.,2022. This concept is raised in the guise of working relationships and allocated roles within acute care. Liaw et al., (2011) suggested the above contributes to the impediment of MET activation. Chua also validated this et al., (2019), recognising the above as organisational factors that influence MET activation. This concept inspired me to reflect on past attendances of MET calls, highlighting the reality of what some participants had conveyed. They are not given a role as such, and they are interrogated when the MET team arrive to establish the events. Owing to some of the issues already discussed, some reported having a fear of looking stupid in front of their colleagues, being reprimanded or, worse, being ridiculed (Cioffi, 2000; Andrews and Waterman, 2005). They often recall questioning themselves about whether they are doing the 'right thing.' This is a valuable opinion to feedback to the organisation, in terms of inclusion within the current in-service education to improve this practice. In Azimirad et al., (2020) study showed that some of the nurses within the sample would not take any action for RRS activation based upon their intuition. As they explored further, they discovered the issue was linked to their confidence in their competent ability to recognise patient deterioration. This study found similar; in the sense the participants were underconfident with their assessment ability in Phase One, even though they successfully coped with situation in

the past, evidenced within the narrative during the interviews. This lack of confidence compromised their appreciation of their own clinical competence. On reflection, all the participants within all three phases of this study dealt with deteriorating patients in isolation, meaning that no clinical supervision was present, or offered to aid their knowledge and skill development. This is pertinent to mention for future educational strategies to boost this confidence in their ability to assess, diagnose and escalate the care of the deteriorating patient. In relation to Benner's (1984) theory, I would estimate that many of the participants at best, would be placed in the advanced beginner's category of the theory due to lack of guidance and educational investment when caring for the deteriorating patient. Conversely as experienced trained nurses working within their specialities, most if not all, would be categorised within the expert stage of the above model , this is where this theory becomes flawed, as the boundaries of each of the categories lack adequate description.

Credibility subtheme (3) Some of the participants claimed they felt a sense of vulnerability and as a result their professional credibility was questioned. Credibility was conceptualised as the feeling of being trusted, having a self-belief, as well as being believed. The latter was of high importance to the participants especially when attempting to escalate the patients care. However, as mentioned when the EWS score was low they found this situation difficult as discussed previously. As the doctor challenged their thought process, and patient assessment, many of participants reported their credibility was also challenged. The feeling of not being believed by the doctor made them feel defenceless in their decision making, this was raised within the literature in relation to packaging deterioration (Andrews and Waterman, 2005; Azimirad et al.,2020; Burke and Conway, 2022). The subjective nature of this situation may contribute to their lack of confidence, in addition to their lack of knowledge and their overreliance on vital sign abnormalities, which may risk devaluing intuitive decision-making (Chua et al., 2019). These negative emotional responses have been proven to delay the escalation of care and management of the deteriorating patient (Massey et al., 2014).

6.3.5 Subthemes (4) Knowledge (5) experience and (6) decision-making

Knowledge subtheme (4): this theme was conceptualised as knowing, through academic study or experiential learning, or a mixture of both. This theme was acknowledged as a catalyst for their confidence as many of the participants wished

their knowledge within this area of inquiry was stronger. Most of the participants had attended the ALS, ILS, and ALERT courses, once in the past, with the average length of time being seven years prior to enrolment onto this study. In Smith et al., (2021) study, the research group identified their participants knowledge of the local deteriorating policy and protocol was inconsistent, with some of the RNs having limited knowledge of the policy and had little recall in relation to its contents. However, in this study many of the participants were able to recall the policy, protocol, and the content even to exact enactment of the threshold trigger for a MET call. Whilst their deliberate knowledge was some years previously before enrolling onto my study, the participants maintained a good standard of procedural knowledge of knowing what to do when a patient is unwell. By means of organising the bedside free from obstruction, fetching the "crash" cart, ensuring the patient had access to oxygen, this was all done prior to activating a MET call, due to fear of criticism, and looking foolish in front of the MET team. Knowledge was associated to credibility and competence, gaining the respect of your colleagues, and the medical team, having someone believe in you, this came across within all phases of the study albeit the most prominent in Phase One. Knowledge was depicted as the common denominator for many of the subthemes, as well as being an enabler, and a barrier, in relation to the currency of the knowledge learnt. Education and knowledge were accepted within the literature as being integral within the process of recognition, and response, to patient deterioration (Andrews and Waterman, 2005; Cox et al.,2006; Cooper et al.,2013; Chua et al.,2022; Dresser et al.,2023).

What is knowledge? According to rationalism, the only source of knowledge is reason rather than experience (Rowbottom, 2010, p. 198). This philosophy has influenced nursing for many years to formalise knowledge to become explicit and legitimate (Carper, 1978; Benner and Tanner, 1987; Chinn and Kramer, 1999). Due to the nature of human meaning this was noted as a difficult concept to formalise, therefore nursing theorists considered other legitimate ways of knowing (Benner, Tanner, and Chelsea, 1992).

Carper's (1978) seminal paper on "patterns of knowing in nursing" was an important landmark in the nursing literature. Carper described what she called fundamental ways of knowing in nursing and stated the body of knowledge that supports nursing is shown through patterns. She created a typology of nursing knowledge categorised into the following:

- **Empirical / nursing science**,
- **Aesthetic/ the art of nursing,**
- **Personal knowing /intuition**
- **Ethical / the moral component** (Carper, 1978; Fawcett and Lee, 2014).

Aesthetic and personal knowing involves the 'subject' while empirical involves the 'object' (Schultz and Meleis, 1988). The latter authors suggested that there is a link between the process of the subject and object of knowing, by acquiring and using clinical knowledge, defined as a type of knowledge related to nursing (tacit knowledge), along with conceptual and empirical knowledge. Tacit knowledge is the knowledge that a person has gained through living experience, both in their personal and professional life (Benner and Tanner, 1987). This knowledge is often referred to as implicit knowledge as opposed to formal or explicit knowledge. This type of knowledge is difficult to express to others as this is more difficult to transfer by means of writing or verbalising Venkitachalam and Busch, (2012, p 363). Benner (1992) proposes nurses rely on their experience to deepen their process of acquiring this knowledge through clinical practice, and it's the accrual of this experience, which enacts their clinical decision making. Chin and Kramer (1999) described this tacit knowledge as clinical knowledge being expressed in nursing practice resulting from the nurses' engagement in the caring process, assisting clinical decision-making, as discussed in the next section with regards to this study.

According to the participants the detection of deterioration was commonly left to the less qualified members of staff, such as healthcare assistants, and student nurses during the routine monitoring of vital signs. The latter is one of the fundamental issues raised within the literature, owing to the turbulence of the ward, lack of staff, relying on agency staff this contributed to the delay in the escalation of patient deterioration. In Wheatley (2006) study, they identified the issue of this over reliance on the untrained members of staff, who lack the knowledge to interpret physiological changes in the vital signs. Hogan supported this, (2006) who noted the under reporting of deviations within the respiratory system and suggested that nurses were reliant on electronic measurements, therefore, miss the importance of measuring their respiratory rates. This opinion was shared by Cox et al.,(2006); Wheatley, (2006); Cooper et al.,(2011) who suggest the focus is more on the machine's performance with less on the sensory skills assessment. This crucial point was highlighted within Smith et al., (2021) study identifying

lack of procedural competence of measuring the respiratory rate correctly. The participants agreed, the importance of interpreting the vital sign data is the first step in the escalation response, often the allocated healthcare professional would complete the round of the vital signs before raising any concerns, this could be an hour before the trained nurse is informed. The latter was discussed within this study in some detail as this portion of the process which appears to be the most vulnerable, according to the participants. Making sense of this information (vital signs) is open to interpretation, to those with the knowledge of the normal versus abnormal parameters, this should be straightforward. The practice of measuring vital signs is under scrutiny, as this was identified as a barrier to the escalation process in several of the studies reviewed (Cioffi, 2000; ludikhuize et al.,2012; Chua et al.,2013; Cardona and Morrell et al., 2016; Burke and Conway,2022; Dresser et al.,2023). The medical staff requires the reporting of the quantifiable changes to make work-based adjustments to prioritise their workload and to start forming a judgement of potential diagnosis before reviewing the patient. The latter was highlighted within Andrews and Waterman (2005) study, in appropriately packaging deterioration to prompt the review process.

Within the literature review some of the qualitative studies explored the ward nurses' experiences of early recognition of patient deterioration. These studies demonstrated that nurses relied upon subjective data, and their experiential knowledge to inform their clinical decision-making (Cioffi, 2000; Minick and Harvey, 2003; Cox et al.,2006; Chua et al.,2020), and this concept was supported within this study. The participants reported this knowledge to be associated with knowing the patient, however, difficulty arose if the patient were not known to them, this was identified as a barrier in the early recognition process. They elaborated on this point, and explained they used the knowledge of the patient's condition, history, baseline function, severity of illness and psychological changes in the vital signs as part of the package to convince the need for a review. The latter was highlighted within Gazarian et al., (2010) study, as important factors to identify patients at risk of adverse events. Whereas other authors in this field would contend this to be perhaps ad hoc, depending on the seniority, and experience of the referring nurse with prior knowledge of patient deterioration. According to some authors at best this referral would be ambiguous, using unconvincing language based on their subjective rather than objective knowledge (Andrews and waterman, 2005; Gazarian et al.,2010; Azimirad et al.,2020; Burke and Conway, 2022).

Experience subtheme (5): conceptualised as gained knowledge through the practical application, or direct observation of patient care. The complexity surrounding clinical decision-making relates to cognitive, intuitive, and experiential aspects, according to Jenks (1993). Many authors have explored this concept and have suggested nurses are able to demonstrate their clinical decision-making through their clinical reflective processes (Benner and Tanner, 1987; Agan, 1987; Rew, 1988; Cody, 2006). In addition, some authors suggest that the decision-making ability of a person is related to intuitive perceptions (Pearson, 2013; Thompson, 2014), whereas other authors would refute this and argue that clinical judgement occurs through experience and knowledge, and knowing the patient (Wheatley, 2006; Donohue and Endacott, 2010; Massey et al., 2014).

Ericsson et al., (2007) and Greenwood and King (1995) suggested recognition of health deterioration is not attributed to clinical experience. They argued that expertise and experience are unrelated. What is proven to improve nurses' ability to recognise deterioration is not simply clinical experience, but deliberate clinical practice, which is the desire to improve one's performance beyond the current level (Ericsson et al., 2007 p. 991). The participants within this study suggested the combination of clinical experience and knowledge have a far greater impact within the real world of nursing than just 'deliberate clinical practice' alone. Their years of clinical experience are evident within the findings and noticeably observed as being a prominent element of their practice. The views of Ericsson et al., (2007) and Greenwood and King (1995) would challenge Benner's (1984) theory, suggesting there is a direct relationship with the accrual of experience within clinical practice. The main tenent of this theory is that nursing decisions can be a result of an almost unconscious level of cognition, and that intuition is gained through experience and plays a significant part in the everyday decision-making (Thompson, 1999b; Andrews and Waterman, 2005). Benner's 'Novice to Expert' approach urges the nurse to compare different sources of information, including the broader concepts of social processes in play when considering patient deterioration. A study completed by Dresser et al., (2023) highlighted that experience played an integral part of nurses' early recognition process of patient deterioration. Past experiences were used to validate the expectations of new experiences. This accounted for the selection of the subtle cues in patients' behaviour, pallor, cognitive function to prompt response to act long before the physiological changes in the EWS were noted. The participants within my study suggested that with experience you can

notice subtle changes in patients, even though the multiple competing factors such as heavy workload, increased patient acuity, reduced resource on the ward, are in play.

The participants within my study had a range of knowledge and experience and it became evident they relied upon this to inform their judgements. The lack of formal knowledge to assist within this process was apparent. This was consistent through all phases of the study. A explanation for this is their reliance on familiarity strategies along the CCT, as previously discussed (Hamm, 1988; Thompson, 2014). In addition, the inclusion criteria for this study stipulated that the participants were to be free from recent formal education, such as ALERT, ILS, ALS etc., before entry. These courses offer specific knowledge relating to patient deterioration and could potentially bias the findings of the study. This may also account for the observed lack of formal knowledge applied to their assessment process.

Deliberate knowledge is known to improve, refresh, and develop skills in this complex clinical area, and has been identified within the literature as an important factor to assist the recognition of deterioration (Pantazopoulos et al., 2012; McDonnell et al., 2013; Hart et al., 2014). It has been suggested that the more knowledge and experience nurses possess, the more they would be inclined to have a systematic approach to patient assessment versus those with far less experience and knowledge (Andrews and Waterman, 2005). However, this was not reflected within this study, as the less experienced appeared more assertive in their decision–making process than some of the more experienced participants. As noted within the findings, 9 of the participants recruited had 12 months or less experience, in contrast to the remaining with 10 years or more working within clinical practice. This observation may be owing to differences in curricular education between the participants. This field of inquiry maintains high profile in clinical practice due to its potential patient outcomes. Therefore, an emphasis is placed on healthcare and higher education providers to foster and promote a patient safety culture through the initiatives discussed, and to ensure their compliance (Francis, 2013; NHS England, 2015; NICE, 2016).

Decision making subtheme (6) this theme was conceptualised as a process of making a choice, informed by assessing the patient to ensure their safety. Nursing decision-making theories place a primary focus on intuitive / experiential learning, according to Cioffi (2000). In her study, they observed that nurses calling the MET team, based their decisions on a subjective process, claiming their sample utilises intuition to inform their

decision. The same concept was highlighted within Andrews and Waterman, (2005) study, suggesting that nurses tended to use strategies such as knowing the patient, pattern and similarity recognition. Burke and Conway (2022) identified the difficulties faced when packaging patient deterioration to the medical staff, using their experiential knowledge to secure a clinical review of the patient. The nurses felt this process was challenging, due to the nature of this subjectivity (intuition/ experiential knowledge) as discussed throughout this thesis, and evidenced within nine of the reviewed studies (Cioffi,2000; Mink and Harvey,2003; Andrews and Waterman, 2005; Cox et al.,2006; Wheatly ,2006, Endacott and Wesley, 2006; Chua et al.,2013;Cooper et al., 2013;Massey et al., 2014).This concept was observed within this study as all participants recognised the potential health deterioration claiming to lean upon their experiential knowledge to inform this decision.

In Douw et al., (2016) study, the concept of intuitive decision making was the focus of this research highlighting concerns surrounding the dismissal of the nurse's assessment, based upon their intuitive account. Although the attention was drawn to intuitive elements of decision making, no attempt was made to account for this, with the outcome of the developed "worry -concern" nurse indicator. My understanding of this system is simply a numeric indicator, which is then added to the existing EWS score, in doing so this raises the EWS score to activate the MET /RRS response. The concept of this theory claims to enhance the "intuitive voice" from the nurses. The overall problem would remain, as stated by the participants within my study the problem is the sensitivity of the EWS tool used, the policy development, and the educational investment in terms of their knowledge and skills to detect early signs of patient deterioration. The latter was supported by the following authors within this field, suggesting that the problems are more multidimensional than it would appear (Gazarian et al.,2010; Pantazopoulos et al.,2012; Smith et al.,2021, Dresser et al.,2023). Smith et al., (2021) reported some decisions were made to normalise the tolerated elevated EWS, based upon the patients' medical history and how persistent the abnormality appeared before any action was taken. Their concern being a spill over effect, where the behaviour of nursing staff is influenced by the action, or lack of action of the medical staff, therefore, adjusting the calling criteria in the EWS context for the more chronic patients such as those with COPD. Furthermore, they indicated this is currently unproven and requires empirical work to understand this concept in more detail. This is the other extreme, to the point of making a complete autonomous decision to not escalate the EWS breach.

The process used to reach this decision it would seem is to review the retrospective EWS data on the patient. My question would be how they would distinguish a consistent tachycardia, from an undiagnosed new onset of atrial fibrillation ? Which is often a missed diagnosis, one with potentially serious health implications to the patient (Dellinger et al.,2012).

Burke and Conway, (2022) stated in light of the COVID -19 crisis this gave rise to shortages of staff, increased workloads, therefore, access to doctors to adjust EWS parameters proved difficult. The Irish EWS tool recommendations from the Department of Health (2020) states that parameters should not be altered, furthermore, its states the EWS response protocol should not be modified within the first 24 hr period of admission. This is a good example of policy guidelines being transparent and clear to all members of staff.

Benner's – Humanistic- intuitive model in decision -making.

A novice practitioner according to Benner (1984) learns to recognise patterns and similarities then link these to facts and features of the situation and base their actions on both. Several of the participants interestingly categorised themselves within this section of this model, claiming their knowledge is basic, and they looked for further guidance and support from colleagues . Advance beginners can identify the wider characteristics of the situation, which according to Benner (1984) can only be attributed through experience. Many of the participants would be placed within this category, owing to their experience, most of which is substantial in caring for the deteriorating patient. As extracted from the data, they are unmistakeably recognising and responding to patient deterioration, however, confidence in their own clinical skill and knowledge appears to be an underlying issue for most of them, creating a barrier to the escalation process as discussed throughout this thesis. A competent nurse has the confidence and ability to cope with a wider range of situations, but lacks speed and flexibility, this is gained as the nurse reflects on their practice, the ability to recognise and prioritise their workload is developed as they move forward, according to Benner's(1984) theory. This is an area in need of further inquiry as data relating to the competencies is very sparse. As stressed within this study the majority of the participants' felt underconfident in their ability to assess and diagnose patient deterioration, in this sense their "competence" should remain guarded, as acknowledged by the participants themselves. The more experienced nurses, who were confident in their

ability to deal with the evolving situation of patient deterioration, were senior in years in terms of clinical practice, in addition to, having years of experience of caring for these type of patients, this impression was supported by the literature (Andrews and Waterman, 2005; Cooper et al.,2013; Azimirad et al., 2020;Smith et al ., 2021; Dresser et al.,2023). The proficient nurse is described as analytical and fluid having the ability to recognise changes from the expected norm, Benner (1984). Many of the participants appear stationary at the advanced beginners' stage as they have clearly demonstrated their tacit knowledge and experience, as a forged union, which appears to have assisted in their proficiency to recognise patient deterioration. On reflection, some of the more experienced in clinical years are fluctuating through stages 1-4 with the dominance being noted within stage two. The basis for this is the lack of invested purposeful education and guidance within this field of inquiry, as mentioned within this thesis many participants lacked knowledge, confidence, and competence when caring for the deteriorating patient, the effects of this within their clinical practice is clearly demonstrated and articulated by the participants throughout this thesis. The learning from cognitive psychology brings much needed clarity around the selection of intuition by the participants when faced with an urgent clinical situation, casting doubt on the currency of Benner's (1984) theory within this field of inquiry. The weaknesses within Benner's (1984) theory outweighs the benefits of its selection within this practice area, leading to the conclusion that the CCT model, and explanation proposed by cognitive psychology has aided a more profound understanding of the participants' selected and utility of intuition. Moreover, the conceptual basis for Benner's (1984) theory of intuitive decision making is directly challenged by the combination of the literature pertaining to NDM and expert decision making, giving rise to my informed decision to decline the use of Benner's (1984) intuitive theory in light of the evidence presented within this thesis.

The cognitive continuum theory (CCT) describes how the task related situations are related to reasoning (Hammond, 1988). The task in this sense is the initial recognition of health deterioration of the patient. Cognition includes two parallel thinking processes: intuition and analysis (Patterson et al., 2017). Experiences that lead to the use of intuition are unexpected, or ill structured situations where the nurse is unable to apply policy, process, guidelines (Hamm, 1988). The narrative given by the participants is the combination of the latter, being on night duty suddenly coming across a patient who

is struggling to breath. This creates a state of panic as described by many of the participants, in addition to the sudden nature of the situation and its urgency, the participants describe their pulse racing, anxiety levels increasing. At this point they are attempting to validate their subjective assessment (intuitive thoughts) of the situation to compare with the objective data (vital signs) to alert the on call medical team, to inform somebody, time is now of the essence. This patient now becomes the participants' sole responsibility to make an informed decision to recognise and respond to this condition, as documented within the literature (Rattray et al.,2011., Cooper et al., 2013; Minyaev et al.,2021). Cognitive psychology and the CCT, have informed the understanding of the process of nurses' recognition and response to patient deterioration. The knowledge base utilised also becomes more apparent, in addition to the reasoning of its selection i.e., the experiential / intuitive knowledge, the unplanned urgency of the situation coupled with the high level of responsibility generates the observed response.

6.3.6 Subtheme (7) Influences of the organisational infrastructure

This section of the discussion focuses on the Trust infrastructure and the relationships with medical staff in relation to the response arm of the analysis. The participants talked quite candidly about their negative and positive experiences generated when using this infrastructure. The infrastructure referred to within the host Trust comprised the use of the EWS, MET calls, the CCOT service, the Datix system, staffing, ward workloads, locum cover and the reviewing process of in-patients. Numerous studies have reported on some of the latter in terms of their significance in creating barriers to the escalation of care (Rattray et al., 2011; Massey et al., 2014; Cardona-Morrell et al, 2016; Smith et al.,2021; Fazzini et al.,2023). The participants alluded to the number of ward staff shortages outweighing the demand of the service needs. This is not an isolated view as numerous comments were highlighted in all three phases within this study. This included the high turnover of locum staff used within the wards; therefore, the concept of knowing the patient became a distant memory. The casual staff may add to the numbers of nurses on the ward to cope with the shortages, but the skill mix is often a problem which delays things even more. This contributes to the multidimensional factors that have been identified to influence this level of practice. In using locum replacements this also removes some of the safety netting to promote early recognition of patient deterioration. In Smith and Aitken's, (2016) study, they identified that fact that ward staffing issues had an adverse effect which influenced patient management,

despite high profile reports such as Francis (2013), Keogh (2013) and Berwick (2013) suggesting severe failings and the urgent need for improvement. Many of the participants reiterated this as common practice within the ward environment, coupled with having locum doctors who were not familiar with the Trust's policies and procedures; they felt this placed them in an even more vulnerable position. The participant commented further, suggesting this does not inspire them with confidence if the doctor on call is impeded to perform basic tasks. This is not an exceptional circumstance, this has become more routine especially at weekends where the reduction in the junior doctors' hours result in gaps in the rota, requiring locum cover (Massey et al., 2014; Hogan et al., 2019; Chua et al., 2019; 2020).

The familiarity of the Trust's policies featured within the analysis, emphasising the need for clarity of certain situations that may occur and for guidance to be provided to staff members, this was also supported by (Smith et al., 2021). Most of the participants feared potential litigation. This involved their own experience and confidence in their own ability, but also having the confidence in the medical staff to support them if needed. Hence, the reason for the adherence to the policies. The governance structure associated with patient safety can generate issues which hinder practice, and this has scarcely been raised within the literature. Although the participants were adhering to the Trust's policies, they also alluded to an undercurrent of concern due to litigation and the internal reporting system of adverse events (the Datix system). This system is a vehicle to report untoward incidents, accidents of patients, assaults and abuse to staff members and was highlighted by Francis (2013) and Keogh (2013) who reported failings to recognise and respond to patient deterioration. Post publication, the surveillance of patients' safety was given a greater emphasis to prevent the replication of harm witnessed within these reports (WHO, 2017).

The participants reported some nurses would be asked to attend an internal inquiry following a near-miss or adverse patient event. They describe the culture within the organisational as punitive, ascribing blame, although projecting a façade of support and protection. A participant recalled the intrinsic fear this had generated, which has an ongoing effect to her practice; she escalates the smallest detail to the medical staff as her confidence was shattered by this experience. This type of situation presented itself through the discussion with the participants with a varying degree of severity and was common. The participants recalled the incidents vividly as if it had just happened;

this incident occurred several years earlier, yet the effects of her confidence remain evident within her clinical practice today. This became the main driver for the participants to depend on the Trust's policies and procedures. Once the EWS score breached the threshold, the participants explained their relief, as the decision process became complete with little effort from them, as previously mentioned (Andrews and Waterman, 2005; Azimirad et al., 2020; Burke and Conway, 2022). The participants were legally aware of their position in relation to this level of care, displaying a high sense of responsibility. They mentioned working within the confines of the Trust's policies and procedures, which affords protection by the Trust under vicarious liability. One of the participants explained that this process is more tranquil when the nurse / doctor relationship paring is a mutual blend of respect and professional credibility. The latter was supported by Chua et al., (2020) as they indicated these issues were not just confined to the nurses but also to the junior medical staff as they reported having similar feelings associated with this level of care.

6.3.7 Subthemes (8) litigation and (9) Communication

These two themes blend well together and were conceptualised as getting the message across as soon as possible and being fearful of a poor patient outcome. The participants expressed their fear and anxieties surrounding litigation and were content at this point to hand over the gauntlet to the medical staff. This was the view of many of the participants, as they emphasised the medical staff would be held to account if things were to go wrong. Doctors are more aware of the consequences of medical negligence, and often deal with this through supreme pretensions that often hide their fear of failure (McKay and Narasimhan, 2012). In Chua et al., (2020) study, they reported on the experiences of the junior medical staff attending to these patients before the escalation of care had occurred, with similar experiences to the nursing staff. However, the difference being there was a great deal more at stake in terms of their credibility, knowledge, and competence, which was wrapped in years of medical hierarchical tradition. They also reported feelings of isolation, anxiety, with expectations to continue with this silo working arrangement, in fear of being subject to criticism by their more senior colleagues. This study was enlightening to read providing the only account to date of this sort of inquiry involving both medical and nursing staff.

Reporting the deterioration of the patient to the medical team was highlighted as a complex process involving a mixture of emotions, as already discussed. Interestingly,

the use of the SBAR tool was very sparse both within this study, and the reported studies, Burke, and Conway (2022) being the most recent, although they also mention its lack of commentary from nurses on the merits of SBAR. Within my own study, the participants qualified the reasoning of SBAR lack of merit, which was owing to a distinct lack of instruction of its use, the process of gathering this information, and the confidence in their ability to succinctly articulate the four recommended categories. Hogan et al., (2019) conducted a review of the EWS, MET, and the uptake of the SBAR tool within the UK, reporting its implementation within the NHS Trusts in the UK in large numbers in 2015. Undoubtedly, this is a valuable tool for use as the communication element is focused on the problem, patients background, coupled with the objective evidence of treatments the patient is currently receiving. However, we need to be mindful of its targeted audience which are ward nurses, most of whom would not have received training in clinical examination, or formal patient assessment, this may impact on their confidence, and ability to use this tool effectively, which may account for its sparse commentary as indicated within the literature (Burke and Conway, 2022).

It was noted that the use of the EWS score by the participants enhanced their confidence and authority to call the medical staff, however the approach was more streamlined when either party were known to each other. This is a cyclical process as the junior doctors rotate into specialities every six months, therefore, building these relationships is completed within a relatively short time frame. These two parties appear to bond rapidly: is this due to their own insecurities within their role and inadvertently providing the support needed to each other? Given further time, this concept would be interesting to explore further as this perspective could offer another dimension to understand this complex relationship. Due to this acquaintance, some of the participants were less anxious when using medical terminology to express their concerns, the more experienced participants were more likely to use medical language and were more assertive compared to those less experienced (Andrews and Waterman, 2005; Cox et al., 2006). These issues were identified within the literature, with claims that nurses are more confident when using the EWS score as an object source when reporting deterioration, although reluctant to use medical language in fear of getting it wrong. When the medical team ask for further information, this can be seen as a delaying tactic which antagonises nurses (Andrews and Waterman, 2005; Hogan, 2006; Cioffi, 2000)

6.3.8 Simulation

Simulation training is not a new concept, having been used in resuscitation training since the early 1960s (Resuscitation Council UK, 2010; Parker and Myrick, 2012; Cooper et al., 2011). This ranges from the known rubber arm used to demonstrate and cultivate the skill of venepuncture and cannulation, through to high fidelity human patient simulators which electronically replicate the patient's physiology and deterioration (Bliss and Aitken, 2018; Cooper et al., 2020). Several authors have commented on the success of simulation training and its positive influence on the management of the deteriorating patient (McDonnell, 2013; Fisher and King, 2013; Bliss and Aitken, 2018). The benefits include the rehearsal of skills and knowledge gained within a practice environment, avoiding fear of failure for the student, and improving patient safety (Witt et al., 2010; Cooper et al., 2015, 2016, 2020).

There is evidence to suggest that the move away from hospital-based training to a higher education institution-based training programme has reduced clinical practice time and exposure to ward-based learning, hence the competitive nature of clinical placements (Klune and Hodges, 2006). Therefore, simulation is ideal to bridge this gap with high fidelity simulation environments offered by the higher education sector, from a complete replication of a ward to a (simulated) functioning ICU, extending out to incorporate maternity and paediatrics settings (Parker and Myrick, 2010). Hayden et al., (2014) concluded that simulation education replaced 50% of clinical hours within undergraduate programmes. The significance being that simulation provides nurses with experience to develop skills, the critical thinking needed for decision-making and offers an opportunity for reflective learning. Studies that have implemented simulation education to nursing students and multidisciplinary teams have demonstrated positive outcomes (Cooper et al., 2011; Hart et al, 2014; Solomon et al., 2016). Wehbe-Janek et al., (2014) discovered that simulation education of the deteriorating patient reduced the level of anxiety of the nursing staff caring for those patients and increased their level of confidence in recognition and response, increasing the level of communication and the activation of the RRT. In addition, simulation education provides knowledge and experience to improve skills and teamwork (Hart et al., 2014; Wehbe-Janek et al., 2014). Therefore, in doing so this would improve the level of competence and confidence for nurses as, suggested by Foronda et al., (2013).

Despite the wealth of literature demonstrating that simulation improves the competence and confidence of the nurse, there are authors who equally discount this

notion and suggest there is little robust evidence to support this (Yuan et al., 2011). However, studies since 2011 have challenged Yuan et al.'s research outcomes by demonstrating evidence to support this theory (Bell-Gordon et al., 2014; Bias et al., 2016; and Bolin et al., 2017). Interestingly, within this study the competence and confidence of the participants was highlighted as influencing factors that either impeded their recognition and response of patient deterioration or enhanced it. The assessment of patient acuity as mentioned was unclear within the Phase One interviews. I decided on a pragmatic approach to understand the participants' assessment in more detail, which in turn would help me understand the issues generated. The simulation used within Phase Two of the study was employed in the opposite sense of its creation: instead of adding value and enhancing the participants' knowledge of the deteriorating patient, it improved the researcher's understanding of the underlying issues of the factors influencing this level of practice in more detail.

The participants within this study alluded to potential performance anxiety being within a small group of people, expressing a fear of getting "it" wrong in the presence of their peers. In addition to note, all the participants had no skill in clinical examination of either a patient or manikin, and this had been flagged as another area of anxiety, to the point this may adversely affect recruitment onto the study. The co-construction of the proposed simulation exercise was critical to its success. Taking this advice on board from the participants in Phase One, we collectively discussed the possibility of a face-to-face desktop exercise, which they were more favourable towards as this would also be on a one-to-one basis and not within the group, therefore reducing the fear and anxieties even further. Amal et al., (2017) found simulation teaching was indicated as a stressor for undergraduate nurses, and the influence of anxiety on performance was either enhanced or deteriorated.

The outcomes associated with the delivery of simulation education is under speculation within the literature. There are several authors within this field contemplating the possibility of web-design learning in simulation scenarios versus face-to-face training. Although there are several strengths and weakness identified in terms of viability, cost, and the delivery of the education, such as the face-to-face methodology being more resource intensive versus a web-based design, the answer to this question remains unclear (Buykx et al., 2011; Cooper et al., 2014; Chua et al., 2019). A study conducted by Cooper et al., (2017) preformed a pre- and post-quasi-experimental evaluation of a e-simulation programme, involving a mixture of trained and final year nursing students

in 20 countries. The conclusion reached was that the E-simulation programme was less resource intensive with the ability to capture a wide audience versus face-to-face teaching. This also demonstrated an improvement in the nurse's knowledge and experience of managing the deteriorating patient.

Figure 11: Illustrating a conceptual model of recognition and response to patient deterioration.

6.4 Summary

This chapter discussed the constructed themes identified within Chapter 5 though the examination of the participants' insights, blending the selected theories and literature. There is a vast amount of literature pertaining to the deteriorating patient, highlighting a failure to rescue, suboptimal care, missed cues by nursing staff, and the detrimental consequences of compromised patient safety relating to this field of inquiry. However, the amount written to substantiate these claims is negligible in comparison to the wider picture of the literature. This study is one of a few studies to explore the process of recognition and response to the deteriorating patient in any great depth. This chapter promotes the complexities faced by ward nurses when dealing with these patients, giving context to this evolving situation, and in some respects raising more questions than answers. It defines the use of both intuition and the selection of experiential knowledge, whilst at the same time acknowledging the absence of formal knowledge and its effects on collegial relationships with medical staff. The discussion identified the overindulgence of patient cues, suggesting other reasoning processes for their emergence and portrayed this in both a negative and positive response. The occurrence of the negative emotional responses yielded both negative and positive influences on this level of care, highlighting in particular "confidence" as a catalyst amongst those documented.

Early recognition of deterioration in Phase Two the VPS was found to be a significant finding, attributed through a mixture of knowledge and pattern recognition. This validated the participants' claim of using intuition and knowing without reason. The significance of the Trust's patient safety infrastructure, which included EWS, policies relating to the deteriorating patient, and aspects of the governance structure, were notably underreported in other studies. Remarkably, the influences of this infrastructure had a profound effect in either promoting or inhibiting the response to patient deterioration. This discussion illustrates the need for targeted strategies aimed to re-frame these processes to improve this level of care and management to the deteriorating patient.

Chapter 7 Reflective Understanding, Conclusion and Recommendations

7.1 Introduction

This research study has given an insight into the multidimensional issues faced by ward nurses when caring for the deteriorating patient. The research question, aims, and objectives have been achieved through both the methodological and theoretical frameworks employed within this study. This captured the experiences of the participants, and provided the narrative required to enhance the understanding of the complexities encountered. The chosen naturalistic paradigm and methodology link together and offer a creative approach to explore nurses' experience of patient deterioration, through a mixture of interviews, simulation, and focus groups. The interviews yielded a great deal of information which became the foundation of the research, to showcase a unique simulation exercise. The simulation staggered the process of the participants' acuity assessment. In doing so, this revealed an array of hidden factors experienced. In addition, the focus groups provided the medium to collectively deconstruct their experiences.

The key findings of this research suggest ward nurses experience significant clinical, emotional, organisational, and system barriers when caring for the deteriorating patient. The incentives established to ease the recognition process and create the desired response were highlighted through both negative and positive aspects and reported within this study to either impede or enhance this process. No research to date has explored these influencing factors at this depth, making known the impact of this inhibitory effect within practice, together with the social and professional interplay and constraints encountered. At the start of this journey, like others working in this field my attention had been diverted to the literature termed "failure to rescue." This highlighted an awareness of factors that influence this level of practice, coupled with the following repetitive caption, "*nurses are failing to recognise cues of patient deterioration.*" Within the limitations of this research, this view is challenged, as all participants demonstrated early recognition of patient deterioration from the outset when completing the simulation exercise.

This chapter will present my reflective understanding on the study's contribution to knowledge within this field of inquiry, the methodology and theoretical frameworks utilised, its rigour and execution, the strengths, and limitations, and finally the conclusion and recommendations for clinical practice.

7.2 Contribution / validation to knowledge

A summary of the contribution to knowledge this thesis offers to this field of inquiry is presented below.

7.2.1 Intuition

Initially, the understanding of why intuition was selected to explain this phenomenon was unclear, leading to question of whether the participants were second-guessing or portraying the spiritual element of intuition, or alternatively, was "intuition" claimed due to their own lack of understanding of the situation? One of theoretical frameworks used within this study was invaluable to enhance this understanding:

- The need for rapid decision-making, as in urgent care, led the participants to assume their use of intuition within the Cognitive Continuum Theory (Hamm, 1988). This was demonstrated within the simulation exercise and claimed during the interviews, owing to the complexities fitting more with the subjective element rather than the objective account of the situation.
- This concept provided a linkage between the use of experiential knowledge and pattern recognition to inform their clinical decision. As no formal measurement was undertaken by the sample to elicit their use of intuition, this study can only endorse the importance of experiential knowledge within this field of inquiry.
- Benner's (1984) novice to expert theory despite its popularity does not explain the relationship between the intuitive decision, and the clinical outcomes of that decision, very well in this field of inquiry. Intuitive cognition offers the explanation needed to assist a deeper understanding of this process. In addition, this rationalises the barriers encountered by the participants when the escalation of care is required. In simulating the assessment process this revealed hidden factors that influenced this level of care such as knowledge, confidence, competence in caring for the deteriorating patient, as discussed throughout this thesis, suggesting, the participants are recognising patient deterioration, but their voices, are just simply being lost through this convoluted process.

- Therefore, I would decline Benner's theory in favour of the explanations offered by cognitive psychology, perhaps a more hybrid approach of targeted educational strategies would be more beneficial to improve this level of understanding, and the clinical practice of nurses' recognition and response to patient deterioration.
- In declining Benner's (1984) theory, this would also add value to the current challenging academic debate of this theory, in questioning its currency and utility within a more advanced world of nursing, and technology, given the theory is relative to the era of its conception. For example, patients' acuity is far greater now than in the days of this model (1984), due to medical advancement and increased life expectancy, having an impact on bed occupancy, length of stay, staffing, and financial resource management within the NHS.

The use of experiential knowledge became known as the participant's main pattern of knowing within this study, as indicated by the fact that their level of theoretical knowledge was observed as being weak and identified as an area for improvement. The EWS system in this incidence became a barrier as they found this challenging to articulate their concerns.

7.2.2 Organisational infrastructure and collegial relationships

The participants highlighted numerous concerns relating to the organisational infrastructure, and more specifically their relationships with the medical staff, which either impeded or improved their escalation response. The nurses were anxious about using the correct medical language to describe the clinical situation, fearful they may be ridiculed, which impacted on their own self-confidence. These concepts were reported within this study to influence effective recognition and response to patient deterioration, which is also consistent with the literature (Endacott et al., 2007; Donohue and Endacott, 2010; Chua et al., 2017).

- Hierarchical issues were apparent as reported by the participants. They described an unwillingness to challenge the doctor, regardless of the doctor's seniority. This was reported through negative emotions experienced, such as a lack of confidence and knowledge. Stein's (1967) "doctor / nurse game" was

evident within the transcribed study data, as the doctor still held the epistemic monopoly of knowledge.

- Other negative emotions experienced were inadequacy in their own knowledge base compared to doctors, leaving the participants to feel under-confident, and some reported feeling intimidated by this for several reasons.

- Epistemic prejudice had been identified through the participants' use of intuitive perception to describe the unfolding clinical situation; this was evident from their retrospective accounts of dealing with the deteriorating patient. The medical staff disregarded the nurses' assessment as subjective, having none too little understanding of what constitutes this knowledge and its legitimacy, according to the participants. Findings from both Endacott et al., (2007) and Donahue and Endacott (2010) identified a lack of communication between medical staff with regards to patient deterioration; despite the nurses' concerns, they would not escalate this to a more senior doctor. No rationale was given for this.

- Many of the participants expressed their fear and anxiety in the use of the internal Datix system, whilst some had issues relating to their own clinical confidence in dealing with the deteriorating patient. The participants termed this system as a "blame culture" only wanting to seek out "who "or "what" is to blame, not really grasping the wider picture in terms of the governance structure.

- Negative emotions were highlighted in terms of activation of a MET call. Whilst some of the participants were comforted by the notion of the MET team, others experienced anxiety, with self-doubt in their decision-making ability. Anxiety was associated with their loss of control, unfamiliarity of an emergency, equipment, and lack of role identification. The participants felt the need for nurses to have a role allocated to them within the unfolding MET. This would enhance their education and in turn alley some of their fears.

- After completing this PhD thesis, I took another position in a Trust with damming reports of "failure to rescue deteriorating hospitalised patients." I utilised this thesis to form the basis of evidence to convey the identified factors that either impede or escalate the recognition and response from ward nurses. I was instrumental in

developing a strategic group to create opportunities for improvement, and I have assisted in the development of the MET team.

7.2.3 Early recognition

In Phase Two of this study, it was noted that all participants without question identified the need to escalate the VPS patients care at an early stage. The rationale for this included their reflection from previous situations, making the connection of the similarities and knowing the potential outcome as experienced previously. They expressed feelings of anxiety owing to the difficulties faced when it came to escalating the care, as indicated by those factors influencing this level of practice, as reported within this study and the literature, with confidence being a common denominator within this process, as mentioned throughout this thesis.

This led to the question of whether this is owing to intuitive perception or familiarity of the patient's condition within the simulation. One could argue the familiarity is due to the presenting complaint i.e., neutropenia. This makes it difficult to separate experience versus expertise (Hedberg and Larrson, 2004) as they are integral parts of pattern recognition, which in turn is central in the process of intuitive perception (Benner and Tanner, 1987). Pattern recognition was evident within the simulation, as only three of the participants held prior knowledge of both chemotherapy and neutropenic sepsis. It is possible this find may have been associated with issues relating to neutropenic sepsis, as all the sample were familiar with this condition and its clinical consequences. The geographical location of the study site may have influenced this as discussed in Chapter 5. However, this challenges the question "*are nurses missing cues of patient deterioration, as reported.*" The answer to this question would be reported as no if you consider the demonstration of early recognition as indicated within this study. This concept is discussed further as a recognised limitation of the study.

7.2.4 Simulation exercise

The simulation used within this study was unique in two ways. Firstly, being a desktop exercise, with this concept being co-constructed with the sample within Phase One. The rationale for this was due to their perception of patient simulation being challenging, intrusive, fearful in the sense of conducting this in an open forum within the simulation suite, monitored, then marked to the point of a formal exam. The desktop

exercise was viewed as less invasive, more private on a one-to-one basis and, as they suggested, the participants would feel more comfortable in disclosing information which may highlight their lack of knowledge, making them feel inadequate, as discussed in Chapters 5 and 6. Secondly, this simulation was less conventional in terms of its application within the study. The aim of this simulation was to enhance the researchers understanding of the participants' assessment of the VPS patient's acuity, rather than enhancing their own knowledge in the conventional sense. This was completed by closely observing and interacting with them at their point of assessment. In doing so, as mentioned, this illuminated many otherwise hidden factors as discussed in Chapters 5 and 6.

7.3 Reflections on methodology and rigour

This section will present the researcher's critical reflections and evaluations of the research design, process, methodology, ethical considerations rigour, strengths, and limitations.

7.3.1 Research design

Interpretive description (ID) acknowledges the constructed and the contextual nature of the human experience, whilst allowing for shared realities. ID is philosophically aligned with interpretive naturalistic orientations, developed as an alternative method for generating knowledge in nursing (Thorne et al., 1997, 2004). Over the past two decades, nursing scholars have drawn inspiration from a broad range of inquiry approaches pushing the boundaries of the methodological rulebooks, due to the constraints of the more traditional approaches and the inability to answer more complex, compelling and contextually embedded questions from clinical practice (Thorne et al., 2016; Morse and Field, 1995). The following describes my own thought process for the development of this study. The recognition and response of managing the deteriorating patient is complex, and more traditional qualitative research designs would have been restrictive.

ID fitted well with the phenomenon of interest owing to its aim of shared reality, allowing for the more complex questions derived from the clinical field to be explored, together with the integrated social processes (Thorne et al., 1997). In subscribing to the constructivist perspective where reality is seen as complex, and where the reality is different for individuals, then the ID approach was an appropriate choice (Appleton

and King, 2002; Thorne et al., 1997). This field of inquiry requires more than description alone. It compels the researcher to explore meanings, illuminating characteristics and patterns to yield a more profound understanding of the reasoning why the phenomenon is occurring, in addition to highlighting strategies to remould some aspects to prevent this reoccurrence.

7.3.2 Data gathering methods

A constructivist ID approach required the researcher to capture the multiplicity of the participants' experiences. Interviewing, simulation, and focus groups facilitated this were listening to the participants, observing, and interacting closely with them generated a rich, broad data set. The interpretation of their experiences was combined with my own as a clinician working within this field of inquiry. This highlighted a mixed perspective that enhanced a deeper understanding of the different roles and social / professional interplay within the situation. The data collection from the multiple sources provided a broader range of insights from the subject area.

Interviewing and the simulation exercise complemented each other, providing different types of data that when combined gave a clearer picture of the reality in this field. The strengths and weaknesses of each were therefore counterbalanced. For example, cases referred to during the interviews involved the participants' reflected account of the situation, their successes, and negative aspects, either in the situation or related to others. During the simulation however, early recognition of health deterioration, a lack of knowledge, confidence, and barriers to the escalation of care were noted. These may not have been raised in the interview situation due to limitations in their own knowledge, meaning they were unaware of the omission or its impact.

The interview sessions were lengthy, and the flow of conversation was maintained without difficulty, giving the impression the participants needed to express their views having never been asked before at this depth. Some delved into different paths that were not needed. As the researcher I saw my role to navigate them back to the path pertinent to the research focus. The use of subjective cues was very evident within the interviews, as well as adequate descriptions of their fears and anxieties when dealing with these patients. They expressed feelings of being alone in their decision-making, and some reported feeling isolated; even though they are working within the wider team, they felt once the care was escalated this terminated their involvement with the patient as the medical team would take over the patient's care. Noted within the

simulation was a distinct lack of role identification and knowledge on their role once the MET call has been activated, leading to question if ward nurses have an identified role within the MET call. This may have gone undetected when using interviews alone as the main data source.

Focus groups were utilised as a peer review session, generating discussions of their performance, and seeking clarity, buy-in, and acceptance from their colleagues that what they had done was the right thing to do at that time. They were able to deliberate the method of learning and relate this directly to the clinical field. The high-fidelity nature of the simulation gave the debate credibility, as similarities were drawn which aided a collective understanding of the wider clinical picture. The participants commented on the lack of opportunity to understand their shared experiences in clinical practice. The groups had people with similar experiences from different specialities, suggesting wide commonalities which were not known to them prior to taking part in this research. They were given some reassurance that these issues are not just related to an individual's performance, but an array of influencing factors.

7.3.3 The researcher

Credibility of the researcher with the experience of both experiential and academic knowledge of the subject area was an influential factor to aid the study's rigour. Chapter 4 depicts the researcher as an experienced clinician within this field of inquiry, with over 30 years of experience in clinical, operational management, research, and education in strategic roles, underpinned by the relevant academic qualifications. Coupled with the knowledge of being a part of the MET team responding to the escalation response, the ward nurses also had somebody to ask questions and allay fears of anxiety whilst on my routine rounds to the wards. As the researcher I was well placed to conduct this study. The difficulty for me as the researcher and the clinician would be the separation of both, hence my reasoning for developing the verification strategies to the extent I have included within this study, as detailed in Chapter 4. I was very mindful not to solely construct my own interpretation of this reality. The verification strategies improved my confidence to avoid this (Lincoln and Guba, 1985). A contrary perspective may have suggested that, as the researcher and clinician, I may not of observed the issues relating to the study as well as an independent researcher removed from the study. To counteract this immersion, the world of the participants through interviews, simulation, and focus groups with in-built verification strategies were key, as well as the understanding of the emotions and the level of urgency needed to enact

the recognition and response processes within this field. In confirming interpretations and definitions with participants through the constant analysis and reflection, this assisted with the clarification of the research focus and the journey moving forward. From a constructivist perspective the researcher is very much a part of this process, hence my selection of this approach as to be removed was not desired or possible. I recognise the findings from this study is contextual to time, place, experience, and the person, meaning another researcher replicating this study with a different background to me may have produced different findings. Therefore, by utilising my own knowledge and clinical expertise this was an important element in the research process and, as Charmaz (2006) indicated, researchers are not passive receptacles into which data are poured.

Throughout the process of this research study, I have worked full-time and become a key healthcare worker within the evolution of the pandemic, where my skills were best utilised within another clinical area to work within emergency medicine. As a result of working closely with patients with COVID-19 I contracted the viruses myself on more than one occasion. The difficulties I faced in the writing-up phase of the study was the time allocated to get to my desk and the consistency to be in that zone and maintain my thought process. Interestingly, my motivation and the need to complete my thesis were intrinsically linked and never faltered. I felt regret in having life events take priority over the PhD, a failure in time management at times, and the inevitability of life pressures took precedence. Along this journey I also had bereavements to content with of both human and animal, all of which contributed to my organisational abilities between my life, work, and PhD balance. As the pandemic eventually started to ease, I managed to pick up the PhD and made this my number one priority to complete.

7.3.4 Sample and recruitment strategies

The sample used within the study contributed to the study's rigour and credibility of the findings, the range and depth of data from different participants, collection methods, different ward settings, time spent in clinical practice, and experience of dealing with the deteriorating patient (Charmaz, 2006). This study had 46 participants. The quality of the data gathered from the different sources was an important factor that impacted on the size of the sample and the achievement of data saturation, as much of the participants were very engaging, articulate, and bursting with information to share in relation to the themes generated. With the majority self-selecting to enter onto the study

after being present at one of the presentations I delivered on the ward, this method by far became the most effective out of the strategies used.

Thorne et al., (1997) stated that measures of rigour place some weight on the range and depth of data gathered, suggesting that ID could produce credible data even with a small sample. In this study, the participants were recruited from a mixture of in-patient medical and surgical wards, with differing levels of experience, and grades. The data sufficiency was determined by the theoretical saturation. Each phase reached its own saturation point when no new data were being generated, a total of 56 hours of interviewing (simulation included), and a further 12 hours with an average of 3 hours per focus group were completed. Thus, triangulation of the participants, areas of work, experience of dealing with the deteriorating patient, and the prolonged engagement in the field enhanced the plausibility of the findings.

The initial recruitment strategy encouraged only a small number of people to come forward and inquire about the study, although I was mindful of the possibility of coercion due to my senior position. The second strategy involved giving out flyers to the in-patient wards. This yielded little interest, and on reflection this approach was too impersonal. The final strategy was the most successful, as this encouraged people to interact and created a discussion at each presentation. I was able to showcase my interpersonal skills, which is consistent with Appleton and King's (2002) suggestion that interaction and discussion is far more likely to gain access to your desired sample. This may also be owing to people being busy, needing the information to be relayed in a very succinct format for them to make an informed decision. My previous roles within clinical research had put me in good stead for the recruitment process, avoiding the possible pitfalls, which made this process seamless. Similarly, my experience within clinical research had also informed me not to over burden the information and consent forms, as this too could potentially be off putting to any perspective participants, although the detail of their involvement was paramount.

7.3.5 Data analysis

Data analysis is central to the credibility of the research, relying upon the researcher to interpret key experiences and perceptions to uncover meaning and provide context (Nowell et al., 2017). The novice researcher often grapples with the "how" of qualitative analysis (Divan et al., 2017). As a novice qualitative researcher, I recognised my own limitations and the need for further guidance. I selected Braun and Clarke's (2006)

framework to provide a systematic approach to describe and explain the process of analysis within the context of this new learning as a novice researcher. The area of inquiry is complex, therefore the approach needed to be concise, clear, and usable. There are many ways to approach thematic analysis. Due to this variety this creates some confusion surrounding thematic analysis versus qualitative content analysis that I wanted to avoid (Javadi and Zarea, 2016).

Braun and Clarke's (2006) framework are the most influential approach used within social science due to its clarity, step-by-step approach, and description. The reality of conducting the analysis was non-linear, complex, and at times a chaotic process due to the amount of data collected. The process of transcribing the interview data was challenging, time consuming and at the same time rewarding in the sense of finding some jewels within the depth of the data, to provide a narrative to make sense of the phenomenon. Whilst the prospect of abstracting data from a wide source seemed appealing, the analysis felt overwhelming at times. Once I had sampled the reality of Braun and Clarke's approach with the initial data transcribing, my confidence and understanding matured as the analysis moved forward. Due to the familiarity and the ease of its usability of this approach I applied this to all phases of the study for consistency.

Coding and the emerging themes were an intense cogitative process in many ways, whilst at the same time becoming more straightforward as I could relate to the emerging themes from clinical practice. As the volume of data built, the process had the potential of becoming more chaotic and difficult to visualise the data set. At this point I was aware of the computerised software NVivo, which I explored. I discovered a sense of being removed from the data, becoming artificial. I moved away from this idea and quickly adapted to colour coding the data. This aided familiarisation with the data and the generation of the initial coding, as described by Braun and Clarke (2006). This facilitated a constant comparative technique giving the vision needed to reduce the chaotic nature as previously described. The data were compared, codes were developed, and then compared to other codes to elicit any subtle differences or similarities in the quotations to ensure no repetition across the data set.

Member checking as described by Lincoln and Guba (1985), Denzin and Lincoln (1994) and Punch (1998) was employed as one of the selected verification strategies which enhanced the credibility of the data analysis. The participants were asked to scrutinise

the findings and feedback their response. They reviewed their own transcripts for accuracy, giving the option to remove any sensitive data if needed. None choose to remove any data. Member checking feeds into the concept of the selected constructivist approach using ID as the methodological framework, ensuring the data collected reflect reality, rather than my own version of events.

Transparency and creating a clear audit trail are a hallmark of credibility of qualitative research (Rosenthal, 2016). The level of detail within Chapter 4 regarding the research methodology is aimed to provide other researchers to replicate this study, utilising its methodology, data collection, and analysis. The findings of this study are situated within a given time and place, with its reconstruction in other similar fields made possible. These findings are not generalisable, but they resonant within clinical practice and could be transferred to similar settings (Birks and Mills, 2011). In drafting this thesis, this created an opportunity to continue the analysis process from a retrospective view. Detailing how decisions were made, when, and the impact to the thesis regarding the categories, codes, concepts as discussed and illustrated within Chapter 4. The aim being to clarify how the key themes and core process which interlink them all were derived, giving the reader the opportunity to make their own informed decision regarding the trustworthiness of the study.

As a novice researcher, the change from the more traditional approach of phenomenology, as initially selected, became a personal obstacle, as I was unaware of my next step to take. This was counteracted by the guidance and support of my supervision team whom all four were articulate in their feedback and advised that I should explore a more generalised generic methodology. Once free from the prescribed tenets of phenomenology, I felt vulnerable, but at the same time excited at the prospect of choosing a methodology more suited to my study. My learning of generic methodology was drawn to Sally Thorne's work on interpretive description, as this bears a similarity to other traditional ancestry with the roots applied to, although not exclusive to health science. ID bridges the gap between theory and practice, allowing for questions directly from clinical practice to be addressed, permitting the barriers of the methodology to be broad and not restrictive (Thorne, 2008).

7.3.6 Ethical issues

As described by McLeod (2019), ethical issues and rigour are closely aligned. During the initial phases of this study, the amount of data being generated was generous and I

realised an additional phase was needed to capture any further insights. As focus groups are an established method of data collection within the development of ID research, this aided my selection, with the intension of developing a collective construction of insights from the participants. Therefore, a further ethical submission was set to incorporate this within the study. No ethical issues were raised during the execution of this study. Therefore, as the researcher I gained the confidence and assurance that the study was ethically sound, evidenced by the absence of any untoward incidents in respect of the participants' privacy, confidentiality, consent, beneficence, and non-malfeasance. None of the participants became distressed during any part of the data collection process. No professional issues were raised in terms of retrospective poor practice, and there were no significant events to report formally during the research process. Plans were in place to support any of the participants in relation to discovery of poor practice. All participants were given a detailed physiological explanation of the VPS (Appendix 7, p295) and the opportunity to attend either the ALERT, ILS or ALS courses as detailed in Chapter 4 as part of the endpoints for the study.

Due to the nature of the research paradigm selected, the co-construction of knowledge as the researcher and clinician within this field posed some subtle personal concerns. Stepping out of the clinician role and assuming the researcher role was an unanticipated difficulty. As the researcher I remained an expert practitioner with advanced knowledge within this field. As such I found this difficult to be non-interventional during the data collection process, mindful not to lead the participant into questions, or indeed answer their questions during the interviews, which improved with practice and supervision. On completion of the interviews, simulation, and focus groups I was able to answer any questions the participants needed at the time. I found myself switching from researcher to clinician more so at this point due to my novice status as a researcher and relying on my strengths as a practitioner and educator. My experience as a clinical research nurse assisted with positioning myself within the researcher role, however, this experience lacked the depth of knowledge needed to complete this study, although once in the mode of being a researcher and understanding this role in more detail, this improved as the research process moved forward.

7.3.7 Strengths of the study

This study provided a much-needed insight into the recognition and response of the deteriorating patient. The international research depicts the status of the nurse missing cues of patient deterioration, whilst glossing over the actual issues raised by nurses as contributory factors influencing this level of practice. This study has been successful in highlighting both the emotional and organisational factors which either impede or escalate this process. The following can be considered as strengths:

- The researcher and the participants were given the opportunity through this study to co-construct a deeper understanding of the processes involved when caring for the deteriorating ward patient. The narrative captured within the study enhanced, both the researchers and participants understanding of this shared reality, and the impact of these influencing factors within clinical practice.
- The researcher's involvement gaining an insider's view of the field, co-constructing, and validating the participants' perceptions revealing issues in relation to those systems placed to enhance this process, such as SBAR, EWS, MET criteria, and the existing hierarchy between the medical and nursing staff. What is more, these issues would have been missed by a researcher without the clinical expertise and knowledge of the field, reducing the potential for suggested recommendations to enhance this level of clinical practice.
- I was pleased that my publication in the British Journal of Nursing (2018) entitled: Factors that influence nurses' assessment of patient acuity and response to acute deterioration, yielded a significant amount of citations, and my presentations at various conferences attracted the attention of the audiences, such as those at the *48th World Congress on Advanced Nursing Research* held in Dublin, Ireland and the *33rd Euro Nursing and Medicare Summit* in Edinburgh, Scotland (see Appendix 4, p 255).
- Due to the subjectivity of intuition seldomly getting the recognition it deserves, this study demonstrates the use of pattern recognition to the point of orchestrating the recognition and response and, due to its idiosyncratic nature, barriers are created which impede the nurses' response to patient deterioration. This study challenges the international view of whether nurses are missing cues of patient deterioration. Suggesting, their voice is lost within this convoluted

process, undoubtedly offering a more focused debate to conduct further research to address this issue in more detail.

7.3.8 Limitations of the study

As a part-time researcher and full-time clinician within the NHS this presented a number of potential limitations to the research process, as follows:

- The long duration of the study programme and the dynamic nature of practice resulted in some of the findings having been already resolved before the conclusion of the study. An example of this is the automation of the EWS system, the positive promotion and display of the scoring criteria for each patient within the ward environment, plus the system prompting when vital signs are due.
- Conducting the research in a single centre relates the findings only to that one centre, whereas duel or multiple centre research would have provided further evidence, adding to the strengths of the study.
- The use of a singular scenario (neutropenic sepsis) may have influenced the outcome of early recognition through the simulation exercise. A mixture of all three clinical scenarios may have produced different findings to compare against each other. Conversely, this potentially would be boarding on the use of a more quantitative approach, which is not desired or consistent with the selected research (naturalistic paradigm), although consistent with a constructivist approach in terms of epistemology.

7.4 Conclusion

My research question following a deep dive into the literature was to understand "are nurses missing cues of patient deterioration, as reported." Therefore, the aim of this study was to understand the process of nurses' recognition and response to patient deterioration in more detail. The objectives were:

1. To identify perceived factors that may influence nurses' recognition and response to patient deterioration.
2. To explore barriers to this process and understand why nurses fail to appropriately escalate the care of the deteriorating patient.
3. To consider the impact of intuition, experiential learning, and knowledge on the effects of nurses' decision-making when escalating to a higher level of care.

As a clinician in this field of inquiry the type of knowledge generation needed to answer these questions necessitated an approach that would allow the researcher to be close to the data collection process. In using a constructivist ID approach, the researcher was able to contribute to the construction of knowledge using the data collection methods as detailed in Chapters 4, 5, 6, and 7. The study revealed several influencing factors contributing to either the participants' patient's assessment or the indirect influence, but nonetheless a powerful display of either impeding or helping to escalate the response. The remaining section of this chapter will focus on highlighting how the aims and objectives for the study have been achieved.

7.4.1 Objective 1

The impact of early recognition and management of patient deterioration in terms of clinical outcomes are well documented within the literature, to the extent of looking beyond the reasoning processes. This study has demonstrated that by taking a deep dive into the process of the initial acuity assessment this unveiled a hidden narrative which aids our understanding as to the reasoning of why this process is seen to fail. An array of hidden factors as discussed in Chapters 5 and 6 were identified that either impede or encourage this escalation process.

7.4.2 Objective 2

The key findings of this research suggest ward nurses experience significant clinical, emotional, organisational, and system barriers when caring for the deteriorating patient. The barriers identified within this process were the utility of intuition used by the sample, the EWS system, the Trust's policies and patient safety infrastructure, and the communication / relationships with medical staff. Surprisingly, epistemic prejudice exists within the professional interplay between doctor and nurse in relation to use of intuition, as illustrated by the lack of regard of the participants' assessment and knowing the patient, as discussed in detail in Chapters 4, 5, 6 and 7. This study questioned whether nurses are "missing cues of clinical deterioration" as, clearly demonstrated within this study, their voice is lost within this convoluted process. The early recognition within this study by all participants is testament to this concept, given their own insights into the barriers they know to exist that may impede their desired response i.e., successfully gaining a medical review for the patient. This is owing to the low EWS score below the threshold to activate a response, even when the nurses know the patient.

7.4.3 Objective 3

The study demonstrated the participants' main source of knowledge was utilised from their experiential knowledge base relying upon their intuitive perception to interpret the emerging situation. The theoretical frameworks employed within the study helped explain this concept in more detail, as discussed within Chapters 4, 5, 6 and 7. Patricia Benner's theory moves the professional nurse through the hierarchy of five levels of growth and acquired skill: novice, advanced beginner, competent, proficient, and expert (Benner, 1984). Within this study novice nurses in the sense of Benner's theory were few in terms of years in clinical practice, however, they had past experiences of deterioration that could be applied to the current situation i.e., simulation and they functioned by following the rules they know i.e., the Trust's escalation policy. Advanced beginners have some experience but struggle with transferring lessons from past experiences. Competent nurses provide care within a vision of the bigger picture, including plans and long-term goals, whereas proficient nurses are guided by a keen sense of perception and view the situation in its entirety.

Much of the sample used within this study had clinical experience of more than 10-20 years within practice. Considering Benner's theory, this would place most of the sample as expert nurses having cultivated their experience over a period of time. This was demonstrated within the study, and discussed in Chapters 4, 5, 6 and 7, as they leant upon their experiential knowledge base to interpret their clinical situations of patient deterioration, coupled with the need to make prompt decisions within a short time frame. The participants described their allegiance to their intuitive perception, which was reinforced during the decision process in urgent care, migrating to the intuitive spectrum of the Cognitive Continuum Model. Through the benefit of reflection and this study, this has made me realise that the concepts mentioned in relation to the utility of intuition within this field of inquiry is a true reflection of what is occurring within clinical practice. Utilising the knowledge of this study myself and the participants included have an increased understanding of why intuition is selected and how this influences our clinical practice.

7.5 Recommendations

This section provides a list of recommendations for clinical practice.

7.5.1 Clinical practice

- The EWS system needs to be more sensitive to activate a MET call even if the patient has scored 3 or less. The NEWS2 (National Early Warning Score) was implemented across the UK in 2012, which appears more sensitive than the previous NEWS. However, problems still exist as indicated within this study. The EWS gradient was a key inhibitory factor for patient review. What is needed to assist nursing staff to gain objectivity within their assessment is another parameter that would capture the nurses' worry or concerns, similar to the DENWIS indicator (Douw et al., 2016). Although this system has primarily been used within a surgical domain, there is no reason why this could not transfer those skills across to general medicine. This would give the nursing staff an extra score system and once combined with NEWS2 this would elevate the score, breaching the desired score and giving intuitive / pattern recognition its legitimacy. The study site is considering at looking at this concept once the final review paper has been submitted, indicating areas for improvement in relation to this level of care.
- Web-based simulation training ***FIRST2ACT,*** developed in Australia, offers a face-to-face programme. With the use of Microsoft Teams and Zoom, this programme could be used in any part of the world. This programme is underpinned by extensive research within this field of inquiry and would be ideally suited to professionals who find it difficult being taught even in small groups when conducting simulation training, as reported within this study. This type of education is known to improve the knowledge and skills of nurses when dealing with the deteriorating patient in turn this would improve their confidence, and their competence within the area of practice (Buykx et al., 2011; Cooper et al., 2016, 2020; Fazzini et al.,2023).
- MET Call – role identification. This featured within this study as most of the participants mentioned within the focus groups and one-to-one interviews that they could not recall the ward nurse having an active role within the MET call. This could be an interesting project to explore in more detail as the nurse becomes more involved within the MET call, their understanding of health issues would be more apparent. This is quite often a missed learning opportunity. As a member of the MET team the reality is, the nurse often stands clear and allows the MET team to take over the care of the patient, with often little feedback given directly to the nurse involved. This could be incorporated within in-service

education programmes that would enhance their education, experience, and confidence in dealing with the deteriorating patient.

- Accessibility to in-house educational programmes such as ALERT, ILS, ALS is necessary to maintain the level of education needed to enhance those skills in early recognition and response. Within this study, the completion of this level of training was an exclusion to the study. The reality is close to two-year completion for most of the sample. This level of education is necessary for the early recognition of patient deterioration, plus assisting the nurse to articulate their concerns with more focus and to enhance the confidence of the nurse to challenge the decision NOT to review the patient once the nurse has raised their concerns.
- The local policy of the deteriorating patient would need to reflect the current research within this field of inquiry, to incorporate factors mentioned throughout this thesis in terms of accessibility during the escalation process. The EWS system employed within the Trust may need reviewing considering its lack of sensitivity mentioned within this study, in addition to other measures to capture the nurse worry indicator score.
- It's my intention to utilise this research to inform and contribute to the developments of caring for the deteriorating patient, starting with local, before proceeding to regional, and possible national level i.e., being an active member of the deteriorating patient steering group, influencing local policy development, having active involvement with the education and training initiatives to increase the opportunity of ward nurses' recognition and response to patient deterioration.

7.5.2 Future research

This study has provided an interesting account of the multidimensional issues faced by the nursing staff when dealing with patient deterioration. There is a wide area of possibilities to explore as a post-doctorate researcher. This research has only brushed the superficial layer of this phenomenon. There is further research needed to understand this level of practice and alert the wider international research community. The focus of this research would benefit from the following:

- The experiences of EWS protocols that consider nurses clinical judgment and the impact to patient care, needs further exploration in light of the evidence reviewed, and highlighted within this thesis.
- Further exploration of the collaboration between the doctor and the nurse role in terms of the escalation process of the deteriorating patient is warranted, to increase a better understanding of these roles in relation to the escalation response given the evidence of the barriers and enablers , as highlighted within this study and the current literature.
- The role of SBAR, and nurses' views surrounding its merits needs further evaluation, to increase the understanding of issues relating to its current lack of utility, in doing so this would create further opportunities to proactively manage those issues identified.
- The impact of the hospital environment on the recognition and response to patient deterioration would be of value to explore in more detail. This would encourage a more focussed view of the current provision of the patient safety infrastructure from a local, and national perspective within the NHS.
- Further, exploration of a hybrid approach aimed at early recognition of patient deterioration in simulation training is warranted to encourage the growth of confidence, and competence of ward nurses.

I leave the final words of this thesis from one of the participants who stated:

To have a patient suddenly go off is scary, to see them given the resuscitative and lifesaving treatment from the MET team is amazing, but being the nurse to recognise and escalate the patients care is the best feeling ever, that's why I am a nurse (P 22).

8.0 References

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Appendix One: Virtual Patient Simulation.

A 33-year-old male admitted via Accident and Emergency Department (AED) feeling unwell and presenting with a fever of 38.8. He is currently receiving chemotherapy for Non-Hodgkin's Lymphoma (NHL); the last chemotherapy was given over ten days ago. He has been brought in from home after being unwell for a couple of days and states he remains worst instead of better. Whilst in AED, he has been given paracetamol to settle his temperature, bloods as well as blood cultures have been taken, and he has received the first line antibiotic therapy. The bloods have not been reviewed at this time. His wife informs you he is normally very chatty but seems very distant and withdrawn.

Stage one

Observations on admission to the ward 14.00 hrs

- **Temp 36.6**
- **Pulse 120**
- **BP 130/80**
- **Resp 20**
- **EWS Score = 2**

Stage two **18.05 hrs**

- **Temp 37.0**
- **Pulse 130**
- **BP 120/76**
- **Resp 22**
- **EWS Score = 2**

You notice Mr X is not as chatty as he was earlier and seems a little vacant when speaking to him? You have also noticed he has not passed any urine according to is his chart for at least 7 hours, although his fluid intake within the chart has been documented as 900 mls in total.

He is looking a little flushed in the face and seems a little agitated.

Stage three **21.00hrs**

The time now id 21.00 hrs the doctors have changed over shifts leaving just the on call medical team within the hospital. You repeat Mr X vital signs again before you leave your shift and discover the following:

- **Temp 37.5**
- **Pulse 160**
- **BP 110/50**

- **Resp 24**
- **EWS Score = 3**

Stage Four **22.15 hrs**

During the handover to the night team, you make aware of Mr X, the nurse in charge of the night shift decides to send the HCA to complete another set of vital signs. Although his last EWS score = 3 , the frequency of his vital signs remained 4 hrly. The Trust policy states if a patient score 3 or above , they must be monitored hourly according to escalation policy. The HCA contacts you immediately concerning the following vital signs :

- **Temp 38.0**
- **Pulse 180**
- **BP 70/50**
- **Resp 28**
- **EWS Score = 12**

Stage Five **22.18 hrs MET team arrive placing resuscitative measures.**

The MET team are attending to Mr X due to his sudden deterioration and instigating interventions to stabilise Mr X condition. At this point, I would like to gain some insight of your knowledge of the situation, surrounding the reasoning for the physiological changes in Mr x vital signs.

- **Why has the situation occurred so suddenly?**
- **Why is the pulse rate elevated?**
- **Do you know why the blood pressure has suddenly reduced?**
- **What is the reason for the raise in body temperature?**

See Appendix 8 for the physiological explanation given to the participants.

Appendix Two: Ethical approved documents Phase One & Two

Dalton, Mark

Cc:
Harrison, John; Malin, Anitra

Inbox
Monday, February 22, 2016 3:17 PM

Dear Mark

With reference to your application for Ethical Approval

16/EHC/011 - Mark Dalton, PGR - What are the understandings and factors that influence the ways in which nurses assess patient acuity and their response to acute deterioration? (John Harrison/Anitra Malin)

Liverpool John Moore's University Research Ethics Committee (REC) has considered the above application and I am pleased to inform you that ethical approval has been granted and the study can now commence.

Approval is given **22/02/2016** on the understanding that:

- any adverse reactions/events which take place during the course of the project are reported to the Committee immediately.
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately.
- the LJMU logo is used for all documentation relating to participant recruitment and participation e.g., poster, information sheets, consent forms, questionnaires. The LJMU logo can be accessed at http://www.ljmu.ac.uk/corporatecommunications/60486.htm

Where any substantive amendments are proposed to the protocol or study procedures further ethical approval must be sought.

Applicants should note that where relevant appropriate gatekeeper / management permission must be obtained prior to the study commencing at the study site concerned.

For details on how to report adverse events or request ethical approval of major amendments please refer to the information provided at http://www.ljmu.ac.uk/RGSO/93205.htm

Please note that ethical approval is given for a period of five years from the date granted and therefore the expiry date for this project will be February 2021. An application for extension of approval must be submitted if the project continues after this date.

Yours sincerely

LIVERPOOL JOHN MOORES UNIVERSITY

Mandy Williams, Research Support Officer (Research Ethics and Governance)
Research and Innovation Services
Kingsway House, Hatton Garden, Liverpool L3 2AJ
t: 01519046467 e: a.f.williams@ljmu.ac.uk

The Royal Liverpool and
Broadgreen University Hospitals
NHS Trust

Royal Liverpool University Hospital
Prescot Street
Liverpool
L7 8XP

Tel: 0151 706 2000
Fax: 0151 706 5806

TRUST APPROVAL LETTER FOR NON-CTIMP STUDIES

Mr Mark Dalton
Royal Liverpool and Broadgreen University Hospitals NHS Trust
Out of Hours Team
Prescot Street
Liverpool
L7 8XP

NIHR: **Non NIHR**
Date: **24/12/2015**

Dear Mr Dalton

RD&I No: 5078
What are the factors that influence how nurses assess patient acuity and their response to acute deterioration?

The above study is a Non-Commercial, Qualitative Only study, sponsored by Liverpool John Moores University and funded by NO FUNDER. The Trust is now happy for you to commence work on this study, using the following ethically approved documents. Please note that the table below lists only the key documents rather than all ethically approved documents. For details of all ethically approved documents please refer to the REC favourable opinion letter and the subsequent amendment letters.

Document	Version	Dated
Protocol	N/A	N/A
PIS&C	1.1	N/A

May I to take this opportunity to remind you of your responsibilities as PI for this study to:-

- Report SAE's as per protocol and Trust policy and record total number on OSIRIS
- Ensure that all screening and recruitment activity is updated on OSIRIS every Friday (training can be obtained if required by phoning Ext 3782)
    - Department of Health target for this study is first patient recruited by <_>
    - Please provide a timely response to requests for information regarding achievement of this target
- For Trust sponsored studies, provide RD&I with copies of regulatory annual progress and safety reports to Ethics
- Complete and return the RD&I annual report form in a timely manner

- Comply with the Research Governance Framework 2nd Ed 2005 including but not limited to the Medicines for Human use (Clinical Trials) 2004 act plus it's appendices and the Data Protection Act 1998
- Read, disseminate to research team and acknowledge to RD&I, Trust research SOP announcements (details of relevant SOP's can be found at http://staffintranet/departments_and_services/corporate_services/research_and_development/documents/documents.aspx)
- Inform RD&I of any amendments to, or changes of status in, the study.
- Ensure any conditions to approval stipulated by the MHRA/ REC have been addressed prior to implementation of approved changes
- Maintain the study site file (if not provided by the sponsor a template is available on the Trust intranet)
- Provide copies of publications

Investigators who do not comply with the above will be dealt with in accordance with the Trust Disciplinary policy and/or will have their research stopped.

I wish you every success with your research. Please contact the RD&I Department if you require any advice on the above points.

Yours sincerely

Julia West
Operational Director RD&I

cc Head of Directorate
Liverpool John Moores University

.....

I agree to the terms and conditions of the Trust research approval for RD&I **5078, What are the factors that influence how nurses assess patient acuity and their response to acute deterioration?** and am aware of my responsibilities under the Research Governance framework and Trust Research SOP's.

Signed: 29/12/2015 Dated: .....

Please return a copy of this letter to the RD&I Department, 4th Floor Linda McCartney Centre, Royal Liverpool Hospital, Prescot Street, Liverpool, L7 8XP

Thank you

Participant information and consent sheet

The Royal Liverpool and Broadgreen University Hospitals NHS Trust

Information Sheet

Study Title: What are the understandings and factors that influence the ways in which nurses assess patient acuity and their response to acute deterioration?

Dear Colleague,

You are invited 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. Ask if there is anything that is not clear or if you would like more information. Take time to decide whether you wish to take part.

What is the purpose of this study?

The aim of this study is to understand the process of the nurse's assessment of and response to patient deterioration. The analysis of this study aims to enhance our understanding by identifying factors associated with the clinical decision-making or judgments in relation to the deteriorating patient.

Why have I been chosen?

You have been chosen to take part due to your experiences in caring for a patient deteriorating in health; this process is called purposeful sampling. This technique has been selected as this would allow the researcher to explore the common and unique experiences of nurses who have had dealing with patients presenting with high EWS (Early Warning Score) Scores and deteriorating health, your participation would be of great value to this research study.

Do I have to take part?

Your participation in the study is completely voluntary. If you 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.

You may be asked to join either the first or the second phase of the study; you will not be expected to complete both phases. The first phase of the study, you will be asked to take part in a short interview you would be interviewed by the nurse researcher conducting the study. The interview would be semi - structured and you would be asked five questions relating to your experience of caring for a patient deteriorating in health, which would last for 1 hour. The second phase of this study, the interview would be structured around a simulation exercise. The form of the simulation exercise will be developed as well as the content post the first round of the interviews in conjunction with the sample. The interviews will be recorded needing transcription later, the transcription would be documented verbatim style, and you will be asked to verify your own interview to help validate the data analysis.

What are the possible disadvantages and risks of taking part?

There are no known disadvantages or risks associated with the participation in the study.

Will my taking part in the study be kept confidential?

Yes. We will follow ethical and legal practice and all information about you will be handled in confidence in accordance with data protection and good clinical practice guidelines.

What will happen to the results of the research study?

The results will be analysed for the purpose of publication in scientific journals and form the basis of the researchers PhD thesis.

Contact for further information Date –

Thank you for taking time to read this information, if you have any problems, concerns, questions or complaints about this study, you should preferably contact Mark Dalton Advanced Nurse Practitioner, principal investigator for this study, Bleep 4050/ ext. 5427

been a qualified nurse, have you received any additional training in the recognition of the deteriorating patient etc.

The Royal Liverpool and Broadgreen University Hospitals NHS Trust

Study Title: What are the understandings and factors that influence the ways in which nurses assess patient acuity and their response to acute deterioration?

Please initial box

1. I confirm that I have read and understand the information sheet dated **02/16** for the above study and have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐

3. I understand the purpose of this research, the results of which will be published in an appropriate scientific journal and form the basis of the researchers PhD thesis. ☐

4. I understand I will attend either one of interviews each lasting approximately 1 hour, the first being semi-structured and asked five questions to discuss an experience detailing a patient deteriorating in health with an elevated EWS score. The second would be a structured simulation exercise. I am aware that both interviews will be taped for the purpose of the study to help the researcher transcribe and interpret the data. ☐

5. I agree to take part in phase one of the study. ☐

6. I agree to take part in phase two of the study. ☐

Name of Participant	Date (day/month/year)	Signature
Name of Person taking consent	Date (day/month/year)	Signature

Dalton, Mark

To:

Wednesday, January 16, 2019 9:39 AM

Hi Jim,

I am about to submit to ethics as a part of this submission i also need to submit the certificate of training for the Ethics course. This is all I have been sent , is this what I submit ?

Mark

LJMU Research Ethics Committee [noreply@quizresults.net]

Tuesday, October 16, 2018 6:37 PM

This is an automatically generated email to certify completion of the LJMU Research Ethics Training. You are receiving this because the LJMU REC has specified your email address for sending the certificate of completion.

Name	Dalton, Mark
LJMU Email address	M.W.Dalton@2014.ljmu.ac.uk
ID number	113520
Date/Time	**16 October 2018 18:37**
Answered:	**3 / 3**
Your Score	**3 / 3 (100%)**
Passing Score	**3 (100%)**
Time Spent:	**38 sec**
Result	Passed

Health Research Authority

MRC Medical Research Council

Is my study research?

To print your result with title and IRAS Project ID please enter your details below:

Title of your research:

IRAS Project ID (if available):

You selected:

- **'No'** - Are the participants in your study randomised to different groups?
- **'No'** - Does your study protocol demand changing treatment/ patient care from accepted standards for any of the patients involved?
- **'No'** - Are your findings going to be generalisable?

Your study would NOT be considered Research by the NHS.

You may still need other approvals.

Researchers requiring further advice (e.g. those not confident with the outcome of this tool) should contact their R&D office or sponsor in the first instance, or the HRA to discuss your study. If contacting the HRA for advice, do this by sending an outline of the project (maximum one page), summarising its purpose, methodology, type of participant and planned location as well as a copy of this results page and a summary of the aspects of the decision(s) that you need further advice on to the HRA Queries Line at HRA.Queries@nhs.net.

For more information please visit the Defining Research table.

Follow this link to start again.

NOTE: If using Internet Explorer please use browser print function.

- **About this tool**
- **Feedback**
- **Contact**
- **Glossary**

LIVERPOOL JOHN MOORES UNIVERSITY

Health and Safety Unit

Risk Assessment			
Building	Royal Liverpool University Hospital	Date of Risk Assessment	01.01.2019
School/Service Department	Faculty of Education, Health and Community	Assessment carried out by	MDalton
Location	Royal Liverpool University Hospital	Signed	MDalton
Activity	Qualitative research	Persons consulted during the Risk Assessment	R&D&I Department based at the host Trust
STEP 1 What are the Hazards? *Spot hazards by* • *Walking around the workplace* • *Speaking to employees* • *Checking manufacturers instructions*	There have been no hazards identified within this ongoing study. However, theoretically a potential harm or hazard could be generated if the nurse responding to the questions highlighted a significant falling in education and knowledge surrounding the deteriorating patient.		
STEP 2 Who might be harmed and how? *Identify groups of people. Staff and students are obvious. but please remember* • *Some staff/students have particular needs* • *People who may not be present all the time* • *Members of the public* • *How your work*	Potentially, this could be a theoretical risk a patient in the care of a nurse who's knowledge and skills are deemed as suboptimal to care for this patient.		

affects others if you share a workplace	
STEP 3 (a) What are you already doing? *What is already in place to reduce the likelihood of harm, or to make any harm less serious*	Discussions have already taken place with the Senior Nursing Management team in relation to this theoretical risk . Nurses working within this Trust are required to attend mandatory training yearly , to maintain their skills and knowledge. The exclusion within phase one and two only extends to those nurses whom have completed this training recently or within the last six months. It has been agreed therefore, if a nurse on the study is identified to have falling in their education and skill in relation to the deteriorating patient , then they would be asked to attend further training and withdraw from the study.
STEP 3 (b) What further action is needed? *Compare what you are already doing with good practice. If there is a gap, please list what needs to be done.*	If this theoretical risk had been identified with one of the nurses, the training would then be attended and a follow – up would be needed by their line manager to give further support.
STEP 4 How will you put the assessment into action? *Please remember to prioritise. Deal with the hazards that are high risk and have serious consequences first*	I would firstly discuss the reasons with the nurse involved and explain the reasons for this and give further information of the training required to give them the support needed to increase their level of education. There has been no issues generated throughout the study thus far and these risks / harm mentioned remains a theoretical risk only.

Review as necessitated by changes.

Appendix Three: Ethical approved documents for Phase Three.

Dear Mark

With reference to your application for Ethical Approval

19EHC002. Mark Dalton, PGR (EHC) - What are the understandings and factors that influence the ways in which nurses assess patient acuity and their response to acute deterioration? (John Harrison/Anitra Malin)

UREC decision: Approved Tue 2/26/2019, 2:39 PM

The University Research Ethics Committee (UREC) has considered the above application by proportionate review. I am pleased to inform you that ethical approval has been granted and the study can now commence.

Approval is given on the understanding that:

- any adverse reactions/events which take place during the course of the project are reported to the Committee immediately by emailing researchethics@ljmu.ac.uk;
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately emailing researchethics@ljmu.ac.uk;.
- the LJMU logo is used for all documentation relating to participant recruitment and participation e.g., poster, information sheets, consent forms, questionnaires. The LJMU logo can be accessed at http://www2.ljmu.ac.uk/corporatecommunications/60486.htm;
- The study consent forms, data, information etc. will be accessible on request to a student's supervisory team and/or to responsible members of Liverpool John Moore's University for monitoring, auditing, and data authenticity purposes.

Where any substantive amendments are proposed to the protocol or study procedures further ethical approval must be sought (https://www2.ljmu.ac.uk/RGSO/93205.htm)

Applicants should note that where relevant appropriate gatekeeper / management permission must be obtained prior to the study commencing at the study site concerned.

Please note that ethical approval is given for a period of five years from the date granted and therefore the expiry date for this project will be 5 years from the approval date. An application for extension of approval must be submitted if the project continues after this date.

Yours sincerely

LIVERPOOL JOHN MOORES UNIVERSITY

Mandy Williams, Research Support Officer
(Research Ethics and Governance)
Research and Innovation Services
Kingsway House, Hatton Garden, Liverpool L3 2AJ
t: 01519046467 e: a.f.williams@ljmu.ac.uk

The Royal Liverpool and Broadgreen University Hospitals

LIVERPOOL JOHN MOORES UNIVERSITY
Participant Information Sheet for Trained nurses working in Royal Liverpool Hospital

LJMU's Research Ethics Committee Approval Reference:
LJMU Participant Information Sheet template v8 Dec'19 version 1.0

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of Study: What *are the factors that influence how nurses assess patient acuity and their response to acute deterioration?*

Date 1st January 2019

Dear Colleague,

You are being invited to take part in a study. Before you decide it is important for you to understand why the study us being done and what participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us 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. Thank you for taking the time to read this.

1. Who will conduct the study?

Study Team
Principal Investigator: Mark Dalton Advanced Nurse Practitioner / PhD Student
bleep 4050/4221 ext 5427
Co-investigator: John Harrison Senior lecturer / PhD supervisor
0151-231-4239

School/Faculty within LJMU: Faculty of Education, Health and Community

Collaborating Institutions: Royal Liverpool University Hospital

LIVERPOOL JOHN MOORES UNIVERSITY

The Royal Liverpool and Broadgreen University Hospitals

Consent Form

Study Title: What are the factors that influence how nurses assess patient acuity and their response to acute deterioration?

	Please initial box
1. I confirm that I have read and understand the information sheet dated **01/01/19** for the above study and have had the opportunity to ask questions.	☐
2. I understand that my participation in the focus group is voluntary and that I am free to withdraw at any time, without giving any reason.	☐
3. I understand the purpose of this research, the results of which will be published in an appropriate scientific journal, and form a basis of the researchers PhD thesis.	☐

Name of Participant	Date (day/month/year)	Signature
Name of Person taking consent	Date (day/month/year)	Signature

Appendix Four: Publications and dissemination of findings.

Publication:

Dalton, M, Harrison, Malin, A, Leavey, C (2018) Factors that influence nurses' assessment of patient acuity and response to acute deterioration. British Journal of Nursing. Vol 27, No 4, P212-217.

Conference presentations:

48th World Congress on Advanced Nursing Research at Dublin, Ireland. 06/2018

Oral presentation.

33rd Euro Nursing and Medicare Summit, Edinburgh, Scotland 08/2018

Poster presentation.

PhD Symposium – Liverpool Medical Institute – Improving and Understanding Health

Oral presentation. 07/2018

Institute for Health Research – Conference, Royal Court, Liverpool

Poster presentation

Appendix Five: Interview Questions Phase One

Box 1. Interview protocol: questions

- Briefly describe a situation that you have dealt with in the past when caring for a patient who suddenly became unwell. Describe your thoughts and actions.
- Briefly describe how you recognised this patient within your care was clinically deteriorating.
- Did you find the EWS system beneficial or problematic to use in this situation?
- Do you have concerns or worries about recognising a patient within your care who is clinically deteriorating?
- Did you feel in control of the situation? Briefly describe your thoughts and feelings.

The above questions have been modified from a validated questionnaire used by the study group, McDonnell et al. (2013) for use within this study with the permission of the authors.

Appendix Six: Excerpt taken from an interview transcript to demonstrate the coding process.

An excerpt taken from one of the interview transcripts **P06 date 04/04/16 time 19.30 hrs** demonstrate this process as follows:

Interviewer – "What do you mean when you say you just had a feeling the patient was unwell"

Participant – "Erm, I would just look at them, they could even have a NEWS of 3, [sic] but you know there is something wrong, cos you know the patient you can see changes in their skin colour or whatever, does that make sense?"

Interviewer – "Yes, that's really interesting, do you think you could elaborate a little more on what you have just mentioned."

Participant – "Erm , yes, I think it's probably that I have been doing it for years, so it's my experience telling me these things, you have to rely upon your gut instinct not just look at the obs and that [sic], what about the patient, [sic] you need to look at everything. You might get a junior nurse look at this the wrong way and that [sic] cos of their lack of experience and intuition, and the" does that makes sense [sic].

Coding colours:

Code – gut instinct - linkage to theme = Intuition = Yellow

Code - knowing the patient – linkage to theme = Red

Code – observations – Linkage to theme = NEWS System = Green

Code - experience = linkage to theme = Knowledge = Pink

Appendix Seven: Physiological explanation of the VPS for the Participants

The physiological deterioration of this patient is not uncommon, the incorrect utility of the EWS system, plus the lack of understanding of the clinical urgency, lack of knowledge, and competence of attending to the critically ill patient, are some of the factors identified within the literature, (McQuillan et al., 1998, Hillman et al., 2005, Ludikhuize et al., 2012, and Mapp et al., 2013). The physiological changes in relation to Mr X are apparent in the first recording of the vital signs within this scenario as illustrated and the diagnosis of neutropenic sepsis is correct. The following definitions of neutropenia and sepsis were selected due to their succinct simplicity:

Neutropenia is defined as an absolute neutrophil count less than 0.5 x 10. 9 / litre, or less than 1.0 x 109 / litre and falling. Its interpretation requires knowledge of chemotherapy and the expected myelosuppression (Song et al. 2010).

A definition of sepsis results from severe infection and has a mortality rate of 25-50% (Jackson & Penprase, 2016).

Stage one: Simulation exercise

Temp - 36.6. Pulse – 120 Resp rate 20 BP 130/80
The vital sign measurement at stage one displays early signs of potentially significant changes within Mr X physiological condition, therefore escalation of Mr X should have been the priority at this point ensuring interventions are placed to prevent any further deterioration, (Odell et al., 2009, Cooper et al ., 2010, Liaw et al., 2011, and Martin 2012). The results of the vital sign measurement recorded in stage three indicates severe physiological disturbance suggestive of septic shock syndrome with a clear SIRS response Systemic Inflammatory Response Syndrome, (Dellinger et al., 2012).

Stage Two: Simulation exercise

Temp 37.0 Pulse 130 Resp rate – 20 BP 120/76

Stage Three: Simulation exercise

Temp 37.5 Pulse 160 Resp rate 20 BP 110/50
Oxygen saturation 79% on room air
Level of consciousness is reduced – Mr X is not very communicative and but responds to voice command.

Stage Four: Simulation exercise

Temp 38 Pulse 180 Resp rate 24 BP 70/50

The vital sign measurements illustrate, a high temperature due to the increase of metabolic activity and the release of pyrogens, which is a substance, typically produced by bacterium which produces fever when introduced or released into the blood system, (Martin 2012). The increased heart rate was later discovered as Atrial Fibrillation (AF). AF is now thought to involve an interaction between initiating triggers, often in the form of rapidly firing ectopic foci located inside one or more pulmonary veins, and an abnormal atrial tissue substrate capable of maintaining the arrhythmia, (Haïssaguerre,1998). Although structural heart disease underlies many cases of AF, the pathogenesis of AF in normal hearts is less well understood, the association is this instance is linked to the underlying cause of sepsis, (Haïssaguerre 1998, and Rodriguez 1999). During the stage of hypoperfusion, hypoxia (reduced oxygen) is caused leading to intracellular lactic acidosis, because of the acidosis the patient will hyperventilate (Increased breathing) to rid the body of carbon dioxide, hypoxia would also account for the reduction in level of consciousness due to decreased cerebral perfusion (Tortora and Grabowski 2000). The baroreceptors in the major arteries detect this releasing epinephrine and norepinephrine, which has a causative effect of vasoconstriction of the kidneys, gastrointestinal tract, and other organs to divert blood to the major organs within the body, (Annane et al 2005; Jones et al., 2010; Derek et al., 2013; and Rochwerg, 2014). The reduction in Mr X urine output is a significant sign often missed within the early stages of sepsis and accounts for the acute kidney injury, due to the activation of renin-angiotensin and the release of anti-diuretic hormone to conserve fluid via the kidneys, hence the lack of blood to the renal system causes the characteristic low urine output, (Zarychanski et al., 2013; and Derek et al., 2013).

The patient mentioned throughout this scenario is a real-life example, taken from my reflective clinical practice portfolio, for the anonymity and protection of the patients' confidentiality the name was omitted. Mr X was escalated to the Intensive Care Unit, with a diagnosis of neutropenic sepsis due to right lower lobe, pneumonia post chemotherapy treatment, where he spent a period of two weeks then transferred back to the ward before discharge home. The early recognition of the developing symptoms is crucial in terms of preventing further deterioration of the patient's condition, the right intervention at the right time is the standard goal of sepsis treatment as the mortality of

sepsis nationally and internationally still remains high, (Dellinger et al., 2012; Martin, 2012; Derek et al., 2013, and Rochwerg 2014).