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The identification of the role and competencies of the graduate nurse in recognising and responding to the deteriorating patient in an acute ward environment: A mixed methods study

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Chapter 2

Literature Review

Introduction

The previous chapter provided a background and justification for the study. Chapter 2 provides a comprehensive narrative literature review of the main concepts. The intent is to afford the reader a comprehensive overview of the relevant concepts and to highlight significant areas of research, identifying gaps and supporting the research questions. It will begin with an explanation of the conceptual framework that was produced from the literature review. A critical discussion of concepts in the conceptual framework include: clinical deterioration; the registered nurses' role in clinical deterioration; and the graduate nurses' role in managing clinical deterioration.

The literature was searched using several scholarly databases including: British Medical Journal Best Practice; CINAHL; Cochrane Library; Informit Health Collection; Joanna Briggs Institute; Medline; ScienceDirect; Scopus; and Summon. The key search terms used for the literature review included: clinical deterioration; deteriorating patient; suboptimal care; adverse events; cardiac arrest, patient assessment; vital signs; critical illness; monitoring; rapid response; early warning score; medical emergency team; nurse; registered nurse; graduate registered nurse; education; self-efficacy; clinical competency; scope of practice; and competency standard.

Conceptual Framework

A conceptual framework for this study was created following a narrative review of the literature on the concepts of clinical deterioration, and the role and competencies related to the registered nurse (RN) and GRN role in recognizing and responding to a patient whose condition is deteriorating. It has been included to provide a basis for the organisation of concepts related to these phenomena and helps to guide the reader

through the collection and analysis of data in order to answer the research questions (Fain, 2015). It was clear that many concepts were imbedded in the phenomena (see Figure 1).
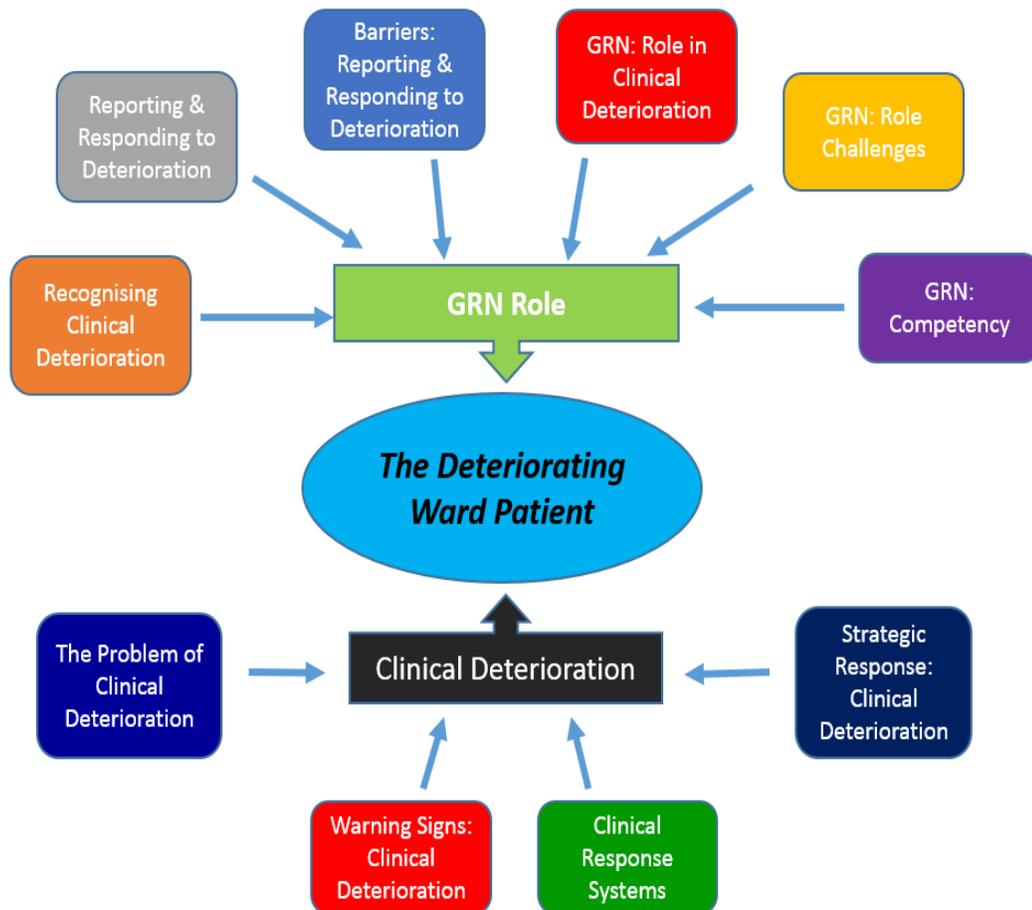

Figure 1. Conceptual framework for study

At the centre of the conceptual framework was the deteriorating ward patient, since the main purpose of the study was to understand the graduate registered nurse (GRN) role and competency in the management of such a patient. It was, therefore, necessary to grasp a clear understanding of the concept of the deteriorating patient, to enable linkages to be made to other studies. For the purpose of this study such a

patient was seen as one whose clinical condition acutely declines, often associated with symptomatic changes in condition, organ dysfunction and an increased risk of adverse events, including unplanned admission to critical care, cardiac arrest, and death. Having considered the concept of the deteriorating ward patient, the conceptual framework focused upon understanding factors surrounding the phenomenon. Such factors included the warning signs of clinical deterioration and the current responses to patients with such a condition, including the clinical systems. The conceptual framework then focused upon the role of the RN and the possible barriers encountered that could influence the recognition, reporting, and response to clinical deterioration in the ward patient. Whilst a GRN was the focus of this study, it was evident that there was a significant paucity in the literature concerning the GRN and their role and competency in the detection and management of the deteriorating patient. Since the aim of this study was to identify the role and competencies undertaken by the GRN in response to clinical deterioration, it was pertinent to investigate the challenges they faced in the development of their role, and the use of competency standards.

The problem of clinical deterioration

In exploring the concept of clinical deterioration, there has been an expanding volume of literature within the last two decades focusing on acute illness and the deteriorating hospital patient. Despite the plethora of literature very few authors have provided an explicit definition of the term deteriorating patient. One definition, however, stated that:

> A deteriorating patient is one 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, Mitchell, Hillman, & Story, 2013, p.1031)

A second similar definition used a dimensional analysis technique to explore the literature focusing upon the acute care and intensive care (ICU) nurses' perspectives of patient deterioration. It described patient deterioration as: 'an evolving, predictable and symptomatic process of worsening physiology towards critical illness (Lavoie, Pepin, & Alderson, 2016).

Despite few definitions of patient deterioration, numerous national and international studies have highlighted the consequences of this condition. Such outcomes have been associated with increased adverse events, extended hospital stay and higher rates of mortality (Baker et al., 2004; Bellomo et al., 2004; Buist et al., 2004; Franklin & Mathew, 1994; Hodgetts et al., 2002; Hogan et al., 2012; Jones, Mitchell, Hillman, & Story, 2013; Matlow et al., 2012; McGloin et al., 1999; McQuillan et al., 1998; Seward et al., 2003).

There is worldwide acknowledgment of the need to ensure all healthcare practitioners involved in the management of hospital patients have the capability to recognize and respond to patient deterioration in a timely and effective manner (ACSQHC, 2010; IHI, 2017; NICE, 2007). There are a number of key factors that have led to the patient's deteriorating condition within the ward area. One of which is suboptimal care.

Suboptimal care

The concept of suboptimal care has been defined as:

> Clearly inappropriate or inadequate treatment. Non-recognition of an abnormality clearly apparent from physiological recordings or laboratory data, but which had either not been identified in the case records or not acted upon with any obvious therapeutic intervention (McGloin et al, 1999, p. 256).

Suboptimal care has been recognised as a significant problem both nationally and internationally (Allen, Elliott, & Jackson, 2017; Anesi, 2017; McQuillan et al., 1998; Quirke et al., 2011). Numerous studies have identified core themes, or attributes related to suboptimal care including: significant delays in diagnosis; treatment and referral of acutely unwell or deteriorating patients; inadequate or incomplete physical assessment; and inappropriate or delayed clinical management (Allen, Elliott, & Jackson, 2017; Anesi, 2017; Franklin & Mathew, 1994; Hodgetts et al., 2002; McGloin et al., 1999; Schein et al., 1990; Seward et al., 2003).

Suboptimal care was first studied in the UK to evaluate the quality of care received by patients prior to admission to intensive care units (McQuillan et al., 1998). The study examined the antecedents and consequences of suboptimal care in a sample of 100 patients including the quality of care provided prior to admission to an ICU. Specifically the study focused upon the adequacy of the initial assessment of the patient including the management of airway, and the evaluation of breathing and circulation. Two assessors rated the quality of medical care, its suitability and the timeliness of admission to the ICU. The findings suggested that 54% of patients had received suboptimal care (McQuillan et al., 1998).

A later study conducted by an independent UK organization; the National Confidential Enquiry into Patient Outcome and Death (NCEPOD), highlighted the problem of suboptimal care. In 2005, a report by NCEPOD found that initial treatment of acutely ill patients was often delayed or inappropriate, despite significant health service funding to improve the management of acute illness, and patient deterioration within the UK hospital setting. Many patients were often physiologically unstable on the wards for prolonged periods before admission to ICU. In addition the assessment, history and examination of these patients, were often incomplete. Of the patients who died within the ICU, 21% of the deaths were thought to be avoidable had there been appropriate initial assessment and management. The report focused upon the medical practitioners providing acute care within the hospital setting (NCEPOD, 2005). The report, however, did not mention the role of nurses in preventing suboptimal care.

More recently, a literature review and concept analysis of the term "suboptimal care" was undertaken aimed at clarifying why and how suboptimal care occurred. Findings included: delays in diagnosis, treatment or referral; poor assessment; and inadequate or inappropriate patient management. Additionally, the study found related contextual antecedents that were categorized into patient complexity, healthcare workforce, organizational and education related factors (Quirke et al., 2011).

Clearly, although suboptimal care has been studied, it remains imperative to improve the recognition and response to patient deterioration. Since nurses are implicitly involved in this process, an understanding and clarification of their role in

the ward area may improve care. Delay is a significant factor in the pathway of clinical deterioration for the ward patient. Improving the nurses' ability to recognise and provide a timely response, is a key factor in tackling the ongoing problem of suboptimal care.

Serious adverse events

Suboptimal care of the deteriorating ward patient has been linked to the occurrence of serious adverse events such as cardiac arrest during hospital admission. The Australian Institute of Health and Welfare (2008) explained serious adverse events as those in which harm resulted to someone receiving health care (AIHW, 2008). Serious adverse events were discussed as patient safety incidents that included unintended, or unexpected events that could have led, or did lead to harm for one, or more patients receiving healthcare (The National Health Service England Patient Safety Domain, 2015).

A number of studies concentrating on the deteriorating patient found that serious adverse events often included unplanned admission to intensive care units, cardiac arrests and unexpected deaths (Cardoso et al., 2011; McGloin et al., 1999; McQuillan et al., 1998; Smith et al., 2008; Story et al., 2004; Volchenboum et al., 2016). In many cases, these adverse events were both preventable and avoidable if physiological warning signs had been recognised, appropriate help summoned, and timely intervention and treatment provided (Allen, Elliott, & Jackson, 2017; Anesi, 2017; Cardoso et al., 2011; Buist et al., 2004; McGloin et al., 1999; McQuillan et al., 1998; Volchenboum et al., 2016; Wilson, Harrison, Gibberd & Hamilton., 1999).

A UK retrospective case record review of 1000 adults who died between 2009 and 2010 was conducted in ten acute care hospitals. Physicians reviewed the cases to identify problems in care that contributed to death, taking into account the patients overall condition. It was found that 5.2% of deaths had a 50%, or greater chance of being preventable. The deaths were related to poor clinical monitoring, diagnostic errors, and inadequate drug or fluid management of the patients (Hogan et al., 2012). The study suggested there would have been 11,859 preventable adult deaths. The

majority (60%) occurred in elderly, frail patients with multiple comorbidities (Hogan et al., 2012).

Suboptimal care, serious adverse events, a failure to recognise patient deterioration and increased mortality have been linked to levels of staffing and resources. A retrospective study looking at the levels of mortality in out-of-hours emergency medical admissions to an UK acute hospital were analysed retrospectively for 15,595 patients admitted under the care of physicians. The study calculated mortality in emergency medical admissions and compared mortality in all out-of-hours periods with in-hours periods. It was found that total mortality for patients was increased for medical admissions at night and in all out-of-hours periods. It was concluded that a lack of resources including reduced staffing levels and skill mix along with organisational factors and severity of illness influenced the increase in out-of-hours adverse events and mortality (Maggs & Mallet, 2010). Whilst the study was significant in highlighting the problem of suboptimal care, it was limited to one district general hospital and did not statistically correct for the patients underlying comorbidities.

Warning signs of clinical deterioration.

There is considerable agreement that clinical deterioration of hospital patients is detectable and preventable in many cases (Allen, Elliott, & Jackson, 2017; Anesi, 2017; Buist et al., 2004; Cardoso et al., 2011; DeVita et al., 2006; McGloin et al., 1999; McQuillan et al., 1998). Warning signs of clinical deterioration such as respiratory dysfunction, altered conscious state and circulatory compromise often exist for many hours before cardiac arrest occurs (Goldhill & McNarry, 2004). Abnormalities in blood pressure, respiratory rate, heart rate, conscious level and oxygen saturation, are common, prior to serious adverse events such as cardiac arrest (Buist et al., 2004). Effective vital sign observation and initiating timely and appropriate intervention to ward patients, is often the key to identifying and appropriately managing the deteriorating patient (ACSQHC, 2017; NICE, 2007; Odell, Victor & Oliver, 2009).

A prospective observational study conducted in a US hospital evaluated the frequency of abnormal vital signs and their association with critical events including mortality, cardiac arrests and unplanned ICU admission. Over a four month period vital signs from medical and surgical inpatients were recorded and compared with records of cardiac arrests, mortality and ICU admissions. It was found that abnormal vital signs were present in 16% of patients, with 35% of these patients experiencing a critical event. Comparatively, of the 84% of patients with normal vital signs, only 2.5% experienced a critical event. Survival was significantly lower in patients with abnormal vital signs at both 30 days and at 1 year following discharge and patients with abnormal vital signs had twice the length of stay of patients with normal vital signs (Lighthall et al., 2009).

A large multi-centre international prospective study was undertaken in 90 hospitals across Australia, New Zealand and the UK to investigate incidences of serious physiological abnormalities preceding primary adverse events (Kause et al., 2004). The primary events measured in the study included in-hospital deaths, cardiac arrests, and unanticipated ICU admissions. Over the study period of three days, 68 hospitals reported 638 primary events including 308 (48.3%) deaths, 141 (22.1%) cardiac arrests, and 189 (29.6%) unplanned ICU admissions. Around 60% (383) of the primary events were preceded by a total of 1032 documented serious physiological abnormalities. The most common derangements were hypotension and a fall in the Glasgow Coma Scale (Kause et al., 2004).

Warning signs of impending cardiac arrest are often present for considerable periods of time (Schein et al., 1990). The antecedents of cardiopulmonary arrest were prospectively studied in 64 US ward patients who had suffered a cardiopulmonary arrest. The aim was to identify underlying disease processes, presenting complaints, changes in clinical observations and common clinical features. The study found that 76% of patients who arrested on the general hospital ward had predominantly respiratory and metabolic derangements immediately prior to the event. Fifty four patients (84%) had altered vital signs demonstrating clinical deterioration within eight hours of arrest. Other changes included derangement in respiratory function and

mental status. Only five patients (8%) survived to discharge. The study concluded that recognising changing physiology and increased efforts to predict and prevent cardiopulmonary arrest might prove beneficial to the patients' outcome (Schein et al., 1990).

An Australian prospective study conducted in five general hospital ward areas aimed to determine the predictive value of selected abnormal clinical observations in a ward patients and the link to in-hospital mortality. During the study period, 6303 patients were admitted to the wards with 564 (8.9%) of patients experiencing 1598 clinically abnormal events. From those 564 patients, 146 (26%) died whilst in hospital. The two most common abnormal clinical events that occurred were oxygen desaturation (51% of all events) and hypotension (17.3% of all events). Using linear regression, six clinical observations were identified as significant predictors of in-hospital mortality. These included a decrease in Glasgow Coma Score, the onset of coma, hypotension, significantly reduced respiratory rate, decreased oxygen saturation and profound bradycardia. The presence of any one of the six events was associated with a 680% increase in the risk of mortality (Buist et al., 2004).

The evidence from these previous studies clearly point to an association between abnormal physiology with altered vital signs and an increase in the risk of patient deterioration, cardiac arrest and higher mortality (Buist et al., 2004; DeVita et al., 2006; Goldhill & McNarry, 2004; Kause et al., 2004; Lighthall et al., 2009; McGloin et al., 1999; Schein et al., 1990). It is crucial that healthcare teams, including graduate nurses, have the competency to recognize the changes in the vital signs that are associated with patient deterioration, and to implement appropriate intervention. There is clear evidence suggesting that should changes in vital signs be missed or not recognized, this can often lead to poor clinical decision making, delays in seeking advice, suboptimal management and serious adverse events with an increase in patient morbidity and mortality (Buist et al., 2004; Goldhill & McNarry, 2004; Lighthall et al., 2009; Schein et al., 1990). The findings from these studies provide justification to investigate graduate nurses' role and competencies in recognizing signs of clinical deterioration.

Clinical Response Systems

In an effort to tackle the problem of patient deterioration, a number of response systems have been developed and tested to try to improve recognition and response. The main goals of these systems have been to: improve patient outcome; reduce the number of adverse events; reduce length of hospital stay; and reduce mortality rates in the acutely ill patient (Allen, Elliott, & Jackson, 2017; Anesi, 2017; Massey et al., 2009).

One system introduced was the "Rapid Response System" or the "RRS". The RRS operates across a hospital and is aimed at the early detection of the seriously ill or deteriorating patients. The system uses the criteria of abnormal vital signs or concerns about the patient's condition, to initiate a call for help (Hillman, Chen, & Jones, 2014). It facilitates members of the hospital staff to advocate for the patient, and raise concerns about the patient's condition. Recently in Australia, there has been a concerted effort to include patients, their relatives, administrative staff, non-qualified healthcare workers, together with health professionals, in the processes of recognition of patient deterioration and the escalation of patient management (Albutt, O'Hara, Conner, Fletcher, & Lawton, 2017). Detection of physiological abnormality, usually related to altered vital signs, acts as a "trigger" for a staff member to call for help from the RRS. An initial coordinated response to assess and stabilise the deteriorating patient from the rapid response team is led by a clinician who possesses expert knowledge, skills and experience (Hillman et al., 2014).

The RRS is often termed as a 'track and trigger' system, with two distinct pathways. The first pathway is a 'tracking' or detection pathway (often known as early warning score) that utilises the criteria of pre-defined physiological signs of clinical deterioration. This first pathway generates a risk stratification score reflecting the ability of the patient to maintain normal physiological perfusion and organ function (DeVita et al., 2006).

The second pathway is the clinical "response". It uses the risk stratification score to determine the appropriate level of clinical response. If a high risk score is generated, an immediate response is provided by the RRS, a team of expert clinicians. The aim of the response is to provide appropriate and timely intervention at the bedside, and to prevent further deterioration (DeVita, 2005; Smith et al., 2008).

Studies evaluating the RRS have uncovered inconsistencies within the literature evaluating the use of RRS track and trigger system. Some studies have called for more comprehensive data to support the effectiveness of RRS. These studies have used outcome measures such as unexpected death and unintended ICU admission to question the effectiveness of RRS in the hospital setting. One such Australian study used a large cluster randomised trial with the aim of evaluating the impact of the introduction of an RRS in 23 hospitals using a medical emergency team (MET). The primary outcome measures were the number of cardiac arrests, unexpected deaths, or unplanned ICU admission during a 6-month study period. It was found that the introduction of the RRS increased the overall calling incidence for a MET. Despite the increased number of calls for help in RRS hospitals, the study found no significant difference in outcomes for patients in the MET system or the control hospitals. The study concluded that the RRS significantly increased emergency team calls, but did not substantially affect the outcome in relation to unplanned ICU admission, cardiac arrest or unexpected death (Hillman et al., 2005).

In 2010, a systematic review and meta-analysis of the international literature was conducted to determine the effect of RRS on reducing cardiopulmonary arrest and hospital mortality rates. Eighteen studies were identified involving nearly 1.3 million hospital admissions. The findings suggested that the implementation of a RSS in adults was associated with a 33.8% reduction in rates of cardiopulmonary arrest, outside the intensive care unit, but was not associated with lower hospital mortality rates. It was concluded that despite RRS reducing the number of cardiac arrests, there was a lack of evidence to support their effectiveness in reducing hospital mortality (Chan, Jain, Nallmothu, Berg, & Sasson, 2010).

In contrast to the previous review there were a plethora of studies that provided evidence to support the effectiveness of RRS. One such study aimed at determining whether the introduction of RRS and a MET would decrease the rate of adverse outcomes in patients undergoing major surgery. The MET consisted of ICU based medical staff who responded to concerns raised by nursing and medical staff in the ward areas. The study compared a control group of 1,116 patients to an intervention group of 1,067 patients over consecutive four month periods. The study found a significant reduction in adverse outcomes, 336 in control group vs 136 in the intervention group, with a 57.8% reduction in relative risk. There was a large decrease in the number of respiratory failures, strokes, sepsis and acute renal failures in the intervention group with a significant reduction in emergency ICU admissions and death. Length of hospital stay also decreased by four days in the intervention group. It was concluded that the introduction of an RRS was associated with a reduced incidence of postoperative adverse outcomes, postoperative mortality rate, and mean duration of hospital stay (Bellomo et al., 2004).

A prospective, before-and-after study was undertaken to determine whether the introduction of a multi-faceted RRS to detect clinical deterioration in patients, would decrease the rate of predefined adverse outcomes. The outcome measures included: the number of unplanned ICU admissions; the number of MET reviews; unexpected hospital deaths; vital sign documentation frequency; and incidences of medical reviews following clinical deterioration. Significant reductions were seen in unplanned ICU admissions and unexpected deaths during the intervention period. The number of medical reviews for patients with significant clinical instability, the number of patients receiving a MET call and the frequency of vital sign recording all increased significantly during the intervention period. It was concluded the introduction of RRS decreased unplanned ICU admissions and unexpected hospital deaths and increased monitoring of vital signs and triggering of a medical review (Mitchell et al., 2010). The study acknowledged some limitations with regards to the lack of a control group and the pre and post intervention groups potentially being unmatched in terms of severity of condition. A further possible bias may have been staff awareness, which may have led to a Hawthorne effect thus potentially affecting the results.

Likewise, the findings of a retrospective study conducted in a 350-bed community hospital in the US, suggested that there was a decrease in the overall hospital mortality related to the effects of a RRS. There was also a reduction in the number of cardiac arrests and unplanned ICU admissions decreased from 45% to 29% (Dacey et al., 2007). The authors concluded that the use of an RRS improved the timely management and ultimately the quality of care delivered to ward patients (Dacey et al., 2007).

An investigation into whether a MET system could reduce the incidence of adverse events, highlighted a significant underutilisation of both the RRS and the MET team. Despite patients meeting documented MET calling criteria, only 30% of these patients actually had a MET called A conclusion from the study identified that many nurses lacked an understanding of the importance of monitoring, documentation and responding to changes in vital signs (Hillman et al., 2005).

A further retrospective comparative study aimed at evaluating a nurse led, after-hours, rapid response system (RRS), and the effect it had on the number of MET calls and adverse events within the hospital. Within the study, an audit of two groups of 150, randomly selected patient's, medical records was undertaken. One group of patients was admitted prior to, and the other after the introduction of the nurse led RRS. The study found that the use of a nurse led RRS did not alter the number of adverse events experienced by patients out of hours. It did, however, suggest that using a reduction in the number of adverse events (such as unplanned ICU admission) as a measure of success for the out-of-hours RRS, may have been misleading. The study identified that the number of unplanned ICU admissions could increase due to improved surveillance and appropriate referral of the patient by the nurse led RRS. It also found a significant level of underutilization of the MET. Although the study identified 45% of patients in the intervention group fulfilled the criteria for MET call, only 2.6% had a MET call activated. Possible reasons for the underutilization of the MET included continuing suboptimal care and delay in activating the MET, or possibly due to successful management of the patients by the nurse led RRS, negating the need for a MET (Massey et al., 2015).

A similar study to determine the prevalence of MET call criteria and the subsequent patient outcomes, was undertaken in 10 Australian hospitals. Of 1688 patients recruited, 3.26% (n = 55) fulfilled MET call criteria at the time of recording a single set of vital signs. None of the 55 patients identified received a MET call within 30 min of being identified. Only 2 (3.6%) of the patients had a MET call within the subsequent 24 hours. It was noted that in-hospital mortality was significantly higher for patients fulfilling MET call criteria (9.1%) compared to those that did not (2.6%) (Bucknall, Jones, Bellomo, & Staples, 2013).

It could be argued that whilst some nurses know the criteria for a MET call, they are reluctant to take action. This reluctance could be associated with a: fear of being reprimanded; misunderstanding the MET activation criteria; allegiance to the home or ward medical team access to advice and support; and improvement in the patient's condition without intervention (Bucknall et al., 2013; Massey et al., 2014; Odell, Victor, & Oliver, 2009).

The problem of failure to call the MET, despite patients meeting the MET call criteria was the impetus for an Australian study to investigate initiatives to improve the use of the RRS and the effect on the number of in-hospital cardiac arrests. The study was undertaken in a 400 bed metropolitan hospital. As part of the study, three initiatives were undertaken: an orientation program for new doctors; professional development for medical registrars; and the use of ICU liaison nurses. It was found that the incidence of cardiac arrests reduced from 2.4/1000 admissions in the year 2000 to 0.66/1000 admissions in 2005. It was concluded that RRS supported by multifaceted education for clinical staff significantly reduced the incidence of cardiac arrest (Buist, Harrison, Abaloz, & Dyke, 2007).

Further systematic literature reviews have also provided support for the use of RRS. A review and meta-analysis of the effectiveness of RRS on rates of in-hospital cardiopulmonary arrest and mortality concluded that the implementation of an RRS was associated with a reduction in cardiopulmonary arrests and hospital mortality (Maharaj, Raffaele, & Wendon, 2015; Solomon, Corwin, Barclay, Quddusi, & Dannenberg, 2016). Abnormality in commonly measured vital signs such as heart rate,

respiratory rate, blood pressure, conscious level and increasing early warning scores were associated with worse outcome for patients and an increase in mortality (Donohue & Endacott, 2010; Goldhill et al., 2005; Jonsson, Jonsdottir, Möller, & Baldursdottir, 2011; Paterson et al., 2006; Smith et al., 2008). Further the literature review identified that the presence of a physician in the RRS did not significantly alter mortality reduction (Maharaj et al., 2015).

The nature of the deteriorating patient and the number of variables, made it difficult to provide clear evidence that the RRS was responsible for the improvement in the patient's condition and outcome. It is clear from these studies, however, that the implementation of the RRS demonstrated a positive effect on the recognition of patient deterioration, which in turn reduced the number of in-hospital cardiac arrests and unplanned ICU admissions.

The Strategic Response

Despite a lack of clear evidence as to the effectiveness of the RRS to improve patient outcomes, many countries have introduced such systems to address the problem of patient deterioration. Internationally, the problem has been a concern to health providers and health care professionals. One of the initial leads in addressing these concerns came from the US Institute for Healthcare Improvement (IHI). In 2004, it instituted a safety and quality improvement campaign: "The 100,000 Lives Campaign". This initiative was introduced into the US healthcare system, to reduce morbidity and mortality related to avoidable deaths. One of the core aims of the campaign was to deploy RR teams to patients at risk of cardiac or respiratory arrest. This led to a nationwide adoption of the RRS within 1,500 US hospitals and subsequently led to a significant reduction in the rates of cardiac arrests, lengths of stay in the ICU, and mortality rates (IHI, 2017).

Following the IHI campaign, many countries implemented similar initiatives to improve healthcare safety and quality focusing upon recognising and responding to patient deterioration. These countries have included: Brazil, the Instituto Qualisa de Gestão; Canada, the Canadian Patient Safety Institute; Denmark, the Operation Life

campaign; Scotland, the Patient Safety Alliance; Wales with 1,000 Lives Campaign; and the UK (IHI, 2017).

The UK has been particularly influential in the development of systems to address the issue of patient deterioration. In 1999, the National Institute for Health and Care Excellence (NICE) was inaugurated as a special health authority, to reduce variation in the availability and quality of treatment and care in the NHS (NICE, 2017). Currently, the remit of NICE is to provide national guidance and advice to improve health and social care. One of the areas that NICE focuses upon is the treatment and care of the acutely ill hospital patient.

In 2007, NICE released the CG50 guidelines namely "Acutely ill adults in hospital: recognising and responding to deterioration". These guidelines recommended the use of RRS for all adult patients within acute care hospital settings in the UK (NICE, 2007). The use of RRS was supported by wide ranging recommendations related to patient management, staff education and the need for competence of healthcare staff caring for the acutely ill patient (NICE, 2007). More specifically, the CG50 guidelines provided specific suggestions concerning all healthcare staff in the acute hospital setting. These guidelines recommended: competencies in monitoring; measurement of patient vital signs and physiology; interpretation of vital sign measurements; and prompt response to the acutely ill patient (NICE, 2007). It was recommended that these competencies were to be at an appropriate level of care, commensurate with the healthcare professionals' scope of practice. The aim was to detect physiological decline in at risk patients and to provide timely clinical intervention. It was envisaged that the competencies would improve both morbidity and mortality, and reduce the incidence of suboptimal care (NICE, 2007).

In 2009, a competency framework designed by the UK Department of Health (UKDH) "Competencies for Recognising and Responding to Acutely Ill Patients in Hospital" (CRRAPH) was produced in support of the NICE CG50 guidelines (Department of Health, 2009). The competency framework outlined specific detailed competency standards for healthcare staff involved in responding to patient deterioration. The work was led by the UKDH, in collaboration with a

multidisciplinary group of expert practitioners, including nurses and training providers (Department of Health, 2009). The CRRAPH framework used a number of pre-existing competency standards developed by the European Society of Intensive Care Medicine (ESICM), the Foundation Programme for post-registration doctors, the Curriculum for Intensive Care Medicine and the Critical Care Advanced Practitioner competencies (Department of Health, 2009). Consensus agreement from the multidisciplinary group helped to finalise the CRRAPH framework. Significantly, the validity of the selected competencies have not, as yet, been tested or validated by any group of healthcare professionals. Thus, one of the aims of this study was to measure the validity of the competency standards documented in the framework, with a group of graduate nurses.

A secondary aim of the competency framework was to support the use of a 'graded response strategy'. This strategy reflected the need for escalating levels of intervention in the care of a deteriorating ward patient. The NICE CG50 guidelines outlined the need for a two tiered response strategy. The first tier included the use of a ward level response, which ranged from an increased level of physiological monitoring, to a patient review by the senior nursing staff, together with calling the medical team responsible for patient care. The second tier response was the use of a dedicated hospital team with specific advanced skills in managing the critically ill patient to review and implement appropriate treatment, following ward level interventions (NICE, 2007).

The CRRAPH competency framework discussed the need for a 'chain of response' (COR) identifying several escalating roles along a continuum (see Figure 2 below).
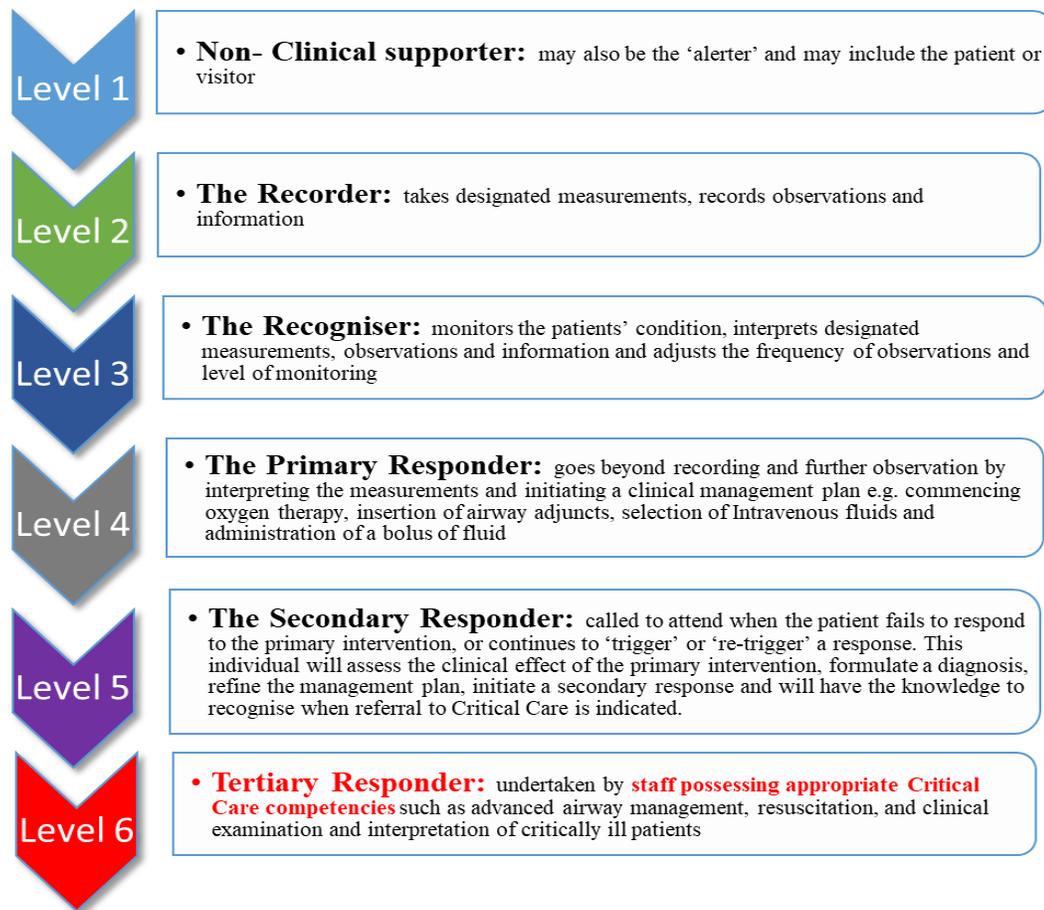
Level 1
- **Non- Clinical supporter:** may also be the 'alerter' and may include the patient or visitor

Level 2
- **The Recorder:** takes designated measurements, records observations and information

Level 3
- **The Recogniser:** monitors the patients' condition, interprets designated measurements, observations and information and adjusts the frequency of observations and level of monitoring

Level 4
- **The Primary Responder:** goes beyond recording and further observation by interpreting the measurements and initiating a clinical management plan e.g. commencing oxygen therapy, insertion of airway adjuncts, selection of Intravenous fluids and administration of a bolus of fluid

Level 5
- **The Secondary Responder:** called to attend when the patient fails to respond to the primary intervention, or continues to 'trigger' or 're-trigger' a response. This individual will assess the clinical effect of the primary intervention, formulate a diagnosis, refine the management plan, initiate a secondary response and will have the knowledge to recognise when referral to Critical Care is indicated.

Level 6
- **Tertiary Responder:** undertaken by **staff possessing appropriate Critical Care competencies** such as advanced airway management, resuscitation, and clinical examination and interpretation of critically ill patients

Figure 2. The "Chain of Response" (Department of Health, 2009).

Each of the roles outlined in the COR recommended competency standards related to the patient's management. The roles were divided from level 1 to 6: level 1 "the alerter"; level 2 "the recorder"; level 3 "the recogniser"; level 4 "the primary responder"; level 5 "the secondary responder"; and finally level 6 "the tertiary responder" The roles escalated in both complexity and responsibility, from the most basic, level 1, to the technically advanced, level 6 (Department of Health, 2009). Whilst the roles were given names, the UKDH competency framework did not provide any recommendation for the allocation of the roles to any one professional group. This action was intentional to provide the organisation implementing the competency framework, maximum flexibility to assign roles based upon professional skill mix (Department of Health, 2009).

Significantly, no studies could be located that determined the validity or relevance of the UKDH competency framework to any specific professional group. One of the key aims of this study was to redress this gap in the literature. This was to be achieved by establishing the validity of the CRRAPH competencies in the GRN role. Also, the study aimed to validate the "chain of response" (COR) levels associated with the acute care competencies by identifying the level and complexity of the role undertaken by GRNs when managing the deteriorating ward patient.

Nurse competencies

Nursing competency standards define the minimum levels of performance that all nurses must demonstrate when providing nursing care (Walker & Godfrey 2008). These standards generally represent a group of specific skills, processes or procedures requiring expertise through the application of appropriate knowledge, skills, abilities and behaviours to perform the tasks skillfully and with confidence (Axley, 2008).

In the early 1990s the Australian Nursing and Midwifery Council (ANMC) introduced a set of national competency standards for registered nurses. The national competency standards defined core competencies to facilitate the assessment of the RN performance, and define the expected standards for practice (ANMAC, 2006). These core competencies were used to guide universities in designing undergraduate curricula leading to a level 1 registered nurse qualification. The use of competency standards has been advocated as a means to clarify the expectations of the nurse's role and performance, and to clearly articulate the scope of practice of a nurse in a particular setting (Watson, Stimpson, Topping, & Porock, 2002). Moreover, the attainment of specific competency standard by the individual was used as a measure of academic achievement from a program of study often referred to as a competency-based model of education (Axley, 2008).

With regards to the deteriorating hospital patient, both undergraduate and post-graduate professional education for all staff including nurses, was seen to be fundamental to the provision of any hospital-based solution to identifying and managing the deteriorating patient (ACSQCH, 2010; ACSQHC, 2014; ACSQHC,

2017). This education was supported by an abundance of studies recommending the need for improved education, clinical skills and a focus on competencies for healthcare professionals, dealing with the acutely unwell deteriorating ward patient (Cutler, 2002; Haines & Coad, 2001; Liaw et al., 2011; McQuillan et al., 1998; Smith & Poplett, 2004; Smith et al., 2008).

In 2008, the ACSQHC released a paper entitled "Recognising and Responding to Clinical Deterioration: A background paper" (ACSQHC, 2008). The intent was to tackle the problem of clinical deterioration with a national strategy of initiatives, aimed to improve patient safety and enhance the quality of care provided in Australia (ACSQHC, 2008). In April 2010, this initiative was followed by the ACSQHC releasing the "National Consensus Statement: Essential elements for recognising and responding to clinical deterioration framework". This document was endorsed by the Australian Federal Health Ministers and based upon the UKDH model. The framework described 8 elements and focused on clinical competence essential for the prompt, reliable recognition and response to clinical deterioration in acute health care facilities across the nation (ACSQHC, 2010). (see Table 1 below).

Table 1

ACSQHC: Essential Elements for Recognising and Responding to Clinical Deterioration.

Clinical Processes	Organisational Prerequisites
1. Measurement and documentation of observations	5 Organisational supports
2. Escalation of care	6 Education
3. Rapid response systems	7 Evaluation, audit and feedback
4. Clinical communication	8 Technological systems and supports

Within the eight elements of the framework, half were broad clinical processes, and the other half focused on organisational prerequisites. The clinical processes were based on assessment, 'tracking' the patient's physiological variances and 'triggering' the appropriate escalation of care provision. These processes were to be supported by effective clinical communication and the well-resourced RRS. There was also a call for the provision of an audit and evaluation system to facilitate quality improvement and lessons learnt. The aim was to provide a hospital wide safety net for ward patients who experienced sudden acute physiological deterioration, or complex needs outside the normal ward staffs level of expertise (ACSQHC, 2010; DeVita et al., 2006).

Within the National Consensus Statement, the major organizational element of "education", mandated that healthcare facilities should have an educated and appropriate skilled workforce to provide appropriate care for the deteriorating patient (ACSQHC, 2010). The "education" element outlined a number of key functions that all healthcare professionals working within the acute care setting should be able to perform. These functions included: the systematic assessment of the patient; understanding and interpreting abnormal physiological parameters; initiating appropriate early interventions for deteriorating patients; and responding with life-sustaining measures in the event of severe or rapid deterioration (ACSQHC, 2010).

In 2012, the Australian focus on the deteriorating patient saw the ACSQHC release the "National Safety and Quality Health Service (NSQHS) Standards" (ACSQHC, 2012). The main purpose of the NSQHS standards was patient safety. It was believed that harm could be minimised by improving the quality of healthcare service, implementing a quality assurance mechanism and evaluating the system. Such an audit was to ensure minimum standards of safety and quality (ACSQHC, 2011). The intent of "Standard 9" of the NSQHS Standards, was to ensure prompt recognition and appropriate timely action in dealing with a deteriorating patient in a hospital setting. This standard was based on the ACSQHC National Consensus Statement, which mandated policies, procedures and protocols within all public and private hospitals. In 2013, all public and private hospitals in Australia were assessed against the NSQHS Standards (ACSQHC, 2010).

Concerns were raised by healthcare professionals, with regards to the NSQHS "Standard 9" recommendations; unfortunately no details were provided as to who raised the concerns. These people felt that the NSQHS recommendations did not go far enough in clarifying the roles of staff and the training they would require to undertake these roles (ACSQHC, 2014). Initially, the NSQHS document advocated that the clinical workforce be trained and proficient in "basic life support" and that a clinician, who could provide "advanced life support" should be within the hospital. In 2013, the feedback received from the healthcare professionals by the ACSQHC, raised further questions regarding, which clinicians needed basic life support education and whether this was sufficient to ensure adequate levels of competency in the skills required to recognise and respond to clinical deterioration (ACSQHC, 2014).

In 2014, in response to the concerns raised by healthcare professionals, the ACSQHC launched a consultation paper: "National Safety and Quality Health Service Standards: Training and competencies for recognising and responding to clinical deterioration in acute care". The paper was aimed at identifying core competencies and training for recognising and responding to clinical deterioration in acute care hospitals, in order to meet the requirements of the NSQHS Standards (ACSQHC, 2014). The paper provided an overview of key safety and quality issues and approaches to training. The ACSQHC advocated that all "clinicians" should possess the necessary skills and knowledge, to keep patients safe, and to avoid preventable harm to the deteriorating patient. The term "clinician" referred to "doctors, nurses and allied health professionals who provide direct patient care" (ACSQHC, 2014, p 1). Fundamental components of successful recognition and response, included the necessity that clinicians should be able to: accurately assess patients; interpret signs and symptoms; recognise the urgency of a situation; communicate effectively; and provide immediate escalation and interventions (ACSQHC, 2014).

The ACSQHC recognised that when clinicians lacked the requisite skills to identify and initiate early interventions, deteriorating patients may receive less than optimal care, leading to serious adverse outcomes (ACSQHC, 2014; NICE, 2007; McGloin et al., 1999; Schein et al., 1990; Smith et al., 2008; Story et al., 2004). To

date, there has not been any specific conclusion to the ACSQHC consultation process. In a private conversation between the researcher and the chief project officer for the ACSQHC, it was apparent that the ACSQHC had no specific plans to release a prescriptive list of competencies for managing the deteriorating patient (Chief project officer, ACSQHC, personal communication, July 19, 2017).

In April 2017, a draft second edition of the NSQHS Standards was released for consultation. Within it, a more detailed section detailing the standard for "Recognising and Responding to Acute Deterioration" was provided. The new standard included the need for clarity of clinical roles and a focus on competencies and skills required to manage the deteriorating patient. The NSQHS consultation also provided a more detailed description of the processes related to governance, together with a requirement for further processes including audit, that support clinicians who respond to clinical deterioration (NSQHC, 2017). The new NSQHS Standards emphasised the need for clinicians to participate in competency-based training to ensure they have the skills and knowledge to recognise and respond to the deterioration patient, and that such training is appropriate to their role. The NSQHS Standards (2017) stated:

> Clinicians who provide clinical care need skills in providing essential emergency interventions for common causes and symptoms of life-threatening physiological deterioration while awaiting help. These include skills in essential emergency management of conditions such as airway obstruction, hypoxia, respiratory distress or suppression, arrhythmia, hypotension, fluid overload, seizures and sepsis (NSQHS Standards Consultation, 2017 p. 394)

As yet, both the ACSQHC and the NSQHS have not provided specific detail as to the core clinical competencies required by healthcare professionals in the management and the deteriorating patient. There also continues to be a lack of delineation of roles in relation to professional groups and the expected competencies of these professions in the management of the deteriorating patient within the Australian healthcare setting. A core aim of this current study was to provide insight into the role and competencies used by the graduate registered nurse when managing the deteriorating patient.

The Registered Nurse and Clinical Deterioration

       Recognising clinical deterioration.

Registered nurses contribution in recognising and responding to the deteriorating ward patient has received considerable attention within the literature (Jones,et al., 2009; Liaw et al., 2011; Massey et al., 2014; Massey, Chaboyer, & Anderson, 2017; Odell et al., 2009; Purling & King, 2012). Research evidence points to the RN being a pivotal contributor to the successful rescue of the deteriorating ward patient (Andrews & Waterman, 2005; Cox, James, & Hunt, 2006; Endacott & Westley, 2006; Endacott et al., 2007; Gazarian, Henneman, & Chandler, 2010; Massey et al., 2014). There does not, however, appear to be any studies that clearly define the RN role. The majority of studies reviewed have broadly focused on the need for ward nurses to recognise and respond to clinical deterioration, activate the RRS, and summon the MET.

       The lack of clarification within the literature of the expected role of the registered nurse is problematic, resulting in role ambiguity, anxiety, inconsistent practice and a lack of intervention to the deteriorating patient. As nurses are in constant contact with patients they have a key role in observation and surveillance of the ward patient (Aiken, Clarke, Silber, & Sloane, 2003). Observance includes the recognition of physiological abnormalities, (Clarke, 2004; Considine & Botti, 2004; Massey et al., 2010). Furthermore, it is suggested a nurse's professional responsibility is to comprehend and identify the significance of patient observations (Hogan, 2006; Kisiel & Perkins, 2006). Patient survival often depends on the nurse's decision to summon assistance (Cioffi, 2000). Effective observation of vital signs and initiating timely and appropriate intervention to ward patients, are often the key to providing appropriate and timely management to the deteriorating patient (NICE, 2007; Odell et al., 2009). It is one of the core aims of this current study to provide some clarity as to the role undertaken by the graduate registered nurse.

Patient's vital signs are commonly reported by nurses as quantifiable physiological indicators, which can act as warning signs that the patient is deteriorating (Gazarian et al., 2010). It is often the changes in these vital signs that are reported to medical staff, in order to gain approval for interventions (Andrews & Waterman, 2005). The cornerstone of many RRS systems are the effective recording of the patients vital signs (Subbe & Welch, 2013).

Whilst objective measures of vital signs were seen by many to be the best way to identify clinical deterioration in the patient, some authors have raised concerns (Cioffi, 2000; Lavoie et al., 2016). It was argued that, depending on clinicians experience and background, the concept of patient deterioration was viewed differently. Acute care ward nurses appeared to be less dependent on objective vital sign measurements to identify patient deterioration. They often seemed to use more subjective cues such as noisy breathing and increase respiratory effort (Cioffi, 2000). This perspective was supported by the suggestion that changes in vital signs were not always present and in some cases were seen to be less sensitive than subjective assessment in identifying clinical deterioration (Lavoie et al, 2016). The literature suggests that patients can be found pulseless, apnoeic, and unresponsive in spite of having normal vital signs at the point of their last measurement (Skrifvars, Nurmi, Ikola, Saarinen, & Castrén, 2006).

Registered nurses' previous experience with similar patients, presenting with similar conditions, may provide RNs with an insight into the usual or expected trajectory and severity of the illness. This insight may be interpreted as intuition and trigger the RN to respond (Gazarian et al., 2010). Knowing the patient and the use of intuition has been linked to the recognition of the deteriorating patient. Subjective cues are often stated by nurses as, "gut feelings" or "sixth sense" (Cioffi, 2000; Cox et al., 2006; Massey et al., 2014). Although experienced nurses' report intuitive feelings, they often confirm their suspicions by undertaking vital sign recordings (Odell et al., 2009). A key component in recognizing patient deterioration was often predicated on nurses knowing or having familiarity with the patient (Andrews & Waterman, 2005; Cioffi, 2000; Cox et al., 2006; Gazarian et al., 2010).

Despite some discussion as to the best method for identifying patients who are deteriorating, it was generally agreed that some form of physiological monitoring was required for the early recognition. It was seen as essential that early recognition would provide an appropriate and timely response (Buist et al., 2004; Franklin & Mathew, 1994; Goldhill & McNarry, 2004; McQuillan et al., 1998; Lighthall et al., 2009; Ludikhuize et al., 2012). As previously alluded to, the lack of recognition of patient deterioration has been highlighted as factor in suboptimal care and has been attributed to the inferior assessment skills of both nursing and medical staff (McGloin et al., 1999; McQuillan et al., 1998). Despite significant agreement that accurate assessment of vital signs was essential for the early recognition of the deteriorating patient, it was particular concerning that several studies identified that monitoring of vital signs was often infrequent, incomplete or poorly performed by the nursing staff (Cardona-Morrell et al., 2016; Mitchell & Van Leuvan, 2008). A contributing factor to the problem of poor vital sign monitoring was the attitudes of nursing staff. The recording of vital signs was often viewed as ritualistic and of low priority by RNs, despite the evidence from studies of its importance in the recognition of patient deterioration (Hogan, 2006).

Further problems in vital sign measurement, was reported in an Australian retrospective observational study conducted on the vital signs charts of 62 ward patients. A total of 1597 vital signs were recorded for the patient group. The study found inconsistencies in the recordings, with a significantly lower recording of respiratory rate in comparison to blood pressure, heart rate and temperature. The study concluded that the inconsistencies to perform vital sign measurements could underpin the failure to recognise the deteriorating ward patient (Mitchell & Van Leuvan, 2008).

A further Australian observational study of 42 nurses working in an acute care hospital, aimed to establish a profile of nurses' vital signs monitoring practices, related dialogue, and adherence to hospital protocols. The study found inconsistent practices in the selection of vital signs to be measured and the nurses' responses to the measurements. The participants appeared to rely on clinical judgement or time availability, rather than on hospital policy. Incomplete sets of vital sign observations

were common with only 6% to 21% of full vital signs being recorded. The study concluded that the inconsistent practices could have adversely impacted on the identification of deteriorating patient (Cardona-Morell et al., 2016).

A small descriptive study using focus groups was undertaken in the UK to explore the reasoning behind the lack of patient vital sign observations and the values and beliefs about patient monitoring. Participants in the study felt that vital sign observations were routine and of little importance, moreover, the task was often delegated to less qualified staff. They also felt that they lacked knowledge and skills to undertake and interpret vital signs appropriately. The study also found that there was a lack of clarity in the required frequency of vital sign observation, which led to disparity between staff and between ward areas (Hogan, 2006). Unfortunately, the study lacked details in terms of sample numbers, population or the number of focus groups. Although the study was small the findings are a sad indictment of registered nurses educational preparation for their role and it serves as evidence that some nurses are unprepared for clinical practice.

In a small UK study that used triangulation and a combination of participant observation and semi-structured interviews, the authors aimed to uncover the practice of recording vital sign observations of general ward patients. The study focused upon how these observations were used in patient assessment. It identified concerns that the task of recording vital signs was often delegated to unqualified healthcare assistants, who relied on electronic equipment. This practice was related to the registered nurse being taken away from the bed side to perform other duties. This occurrence could have led to information about vital cues being missed and the patient's condition deteriorating (Wheatley, 2006). Whilst this study concurred with other studies, it was limited to one hospital and two wards, with 10 registered nurses and 10 healthcare assistants. Limitations notwithstanding, however, it compels registered nurses to become vigilant in their scope of clinical practice. It identifies the importance of experience and expertise in the assessment of the patient's condition and identification of clinical deterioration.

The early warning scoring system used to track the patient's vital signs and trigger the RSS was identified in some studies as a barrier to vital sign recording and activation of the RRS. A literature review aimed at comparing single parameter track and trigger systems (SPTTS), identified that some systems are poor at differentiating between patients at risk of deterioration and those with transient abnormality (Smith et al., 2008). This lack of differentiation, between transient abnormality, and patient deterioration was identified as being problematic for nurses. The frequency of triggering from a SPTTS could have potentially desensitized nursing staff over time. Moreover, it could potentially lead to a point where abnormal vital signs may not be viewed as significant by the nursing staff leading to suboptimal care and further adverse events (Smith & Aitken, 2016).

Several studies commented on the reliance of equipment to monitor vital signs (Cox et al., 2006; Hogan, 2006; Wheatley, 2006). The evidence from these studies suggested nurses focused less on their sensory skills of assessment missed vital cues in detecting patient deterioration (Cox et al., 2006; Wheatley, 2006). As previously mentioned subtle cues such as noisy breathing and agitation can appear prior to changes in the patient's vital signs (Cioffi et al., 2010; Gazarian et al., 2010).

With the advent of increased medical technology, it is not uncommon for nurses to use a variety of tools to measure vital signs. It is argued, however, that a reliance on the use of electronic monitoring equipment has led to de-skilling of registered nurses, with the result they are less capable of performing competent physical assessment of the patient (Wheatley, 2006). A descriptive study exploring experienced nurses' perceptions of graduate nurse competence in acute care, identified concerns with regards to assessment skills. The study found that experienced nurses felt that graduates were over reliant on equipment and did not possess the skills to adequately assess the patient (Hartigan, Murphy, Flynn, & Walshe, 2010). The studies discussing the lack of vital signs recordings provide some useful insight into the perceptions and practices of registered nurses. It is worth noting, however, that these studies could not be generalized to a larger population as they used small sample sizes and a descriptive methodology. As such these studies could be considered less

significant. Nevertheless, registered nurses should be diligent and less complacent about the significance of measuring and recording vital signs.

Reporting and responding to clinical deterioration.

As nurses are primarily responsible for taking and recording vital signs, they play a vital role in summoning help to the deteriorating patients and achieving a positive outcome (Andrews & Waterman, 2005; Cox et al., 2006; Endacott & Westley, 2006; Endacott et al., 2007; Gazarian et al., 2010; Liaw et al., 2011; Massey et al., 2014; Massey et al., 2015). The early call for help and activation of the RRS provides the patient with appropriate and timely intervention to prevent further physiological decline (Buist et al., 2004; Franklin & Mathew, 1994; Goldhill & McNarry, 2004; Lighthall et al., 2009; Ludikhuize et al., 2012; McQuillan et al., 1998; Subbe & Welch, 2015).

Expectations of the registered nurse.

The literature concerning the expectations of the registered nurse in the management of the deteriorating patient is vague. Despite recommendations by the ACSQHC, NICE and the development by the UKDH of the CRRAPH competency standards for healthcare staff, no specific recommendations or guidance has been provided as to the expected role, or level of intervention to be provided by the registered nurse. The implied expectation of registered nurses in the Australian health system appears to suggest that "calling for help" and having the skills to provide cardiopulmonary resuscitation to a patient in cardiac arrest is all that is required (ACSQHC, 2010; NSQHS, 2012).

A number of studies have described the level of intervention provided by nurses when a patient's condition is deteriorating. Some provide a basic level of intervention prior to the arrival of the RRS team, such as the: administration of supplemental oxygen; suctioning of the airway; positioning of the patient; and preparing intravenous fluids (Considine & Botti 2004; Donohue & Endacott, 2010).

Despite a number of studies advocating that nurses should provide interventions to stabilize the deteriorating patient prior to arrival of the MET (Bobay, Fiorelli, & Anderson, 2008; Brunt, 2005; Clarke, 2004; Considine & Botti, 2004; Donohue & Endacott, 2010; Liaw et al., 2011; Odell et al., 2009), none have recommended or mandated specific interventions that registered nurses should be enabled to undertake, prior to arrival of the MET.

It has been argued that the registered nurse level of intervention for the deteriorating patient should extend beyond basic interventions to include administration of supplemental oxygen, intravenous cannulation and ECG recording. It is suggested that although nurses are constrained by medical orders, they should make decisions regarding the administration of drugs and intravenous fluids in response to physiological abnormalities detected. Some experienced nurses, however, have made appropriate clinical judgments, acting beyond the medical direction and have advised junior doctors. These nurses determine the need for consultation, the level of urgency, and the seniority of medical doctor required to manage the patient's problem (Considine & Botti, 2004). This level of performance, however, has caused some internal conflict concerning roles and the scope of their practice (Cutler, 2002).

Scope of practice.

The "scope of practice" for nurses has received considerable attention within the contemporary literature. In a broad definition, the nursing scope of practice was seen to:

> Describe the competencies (knowledge, skills and judgement), professional accountabilities and responsibilities of the nurse. It provides the foundation for establishing standards of nursing practice, nursing education, nursing roles and responsibilities (The International Council of Nurses; 2013 p 2).

The definition of the "scope of practice" was a contentious issue. It is viewed by some to be poorly defined, and difficult to interpret, due to inconsistent language within the literature (Birks, Davis, Smithson, & Cant, 2016; Duffield, Gardner, Chang,

Fry, & Stasa, 2011). The lack of clarity in the understanding of scope of practice and its application to new and existing nursing roles creates significant anxiety amongst practicing nurses, including role ambiguity and role stress (Birks et al., 2016).

A qualitative study was undertaken in Australia to discover the educational needs of RNs regarding the law. Within the study, 30 RNs were involved in several semi-structured focus groups. The study found considerable levels of anxiety and confusion amongst the participants regarding their scope of practice. In particular, RNs were concerned about the occurrence of adverse events, and the possible professional and legal consequences that they might have faced if they were judged to have worked outside their scope of practice. The law was seen to form a 'ceiling' to clinical practice. A way of minimizing the risk of legal consequences, if nurses were uncertain about their scope of practice, was to defer to staff with higher authority. The study identified that nurse managers used the threat of legal consequences to control nurses' clinical practice. The anxiety and stress associated with the perception of legal consequences changed the way nurse's practice, making them fearful, reluctant to make decision and at time unwilling to take action for fear of retribution (Savage, Knight, & Knight, 2011). Whilst the findings of the study are limited by sample size and methods, they provide a valid insight into the potential cost of poorly defined roles and scope of practice and the constraints this may place upon nurse.

Barriers to recognising & responding.

Thus far, this literature review has established the importance of nurses recognizing and managing the deteriorating patient. A delay in calling for help and activating the RRS leads to poor patient outcomes and doubles in-hospital mortality (Downey et al., 2008; Fuhrmann, Lippert, Perner, & Østergaard, 2008; Tee et al., 2008). The weakest link in the chain of survival of deteriorating patients is the reporting of physiological abnormalities and the activation of the RRS (Subbe & Welch, 2013). Several studies have identified that RNs are often reluctant, or afraid to activate the RRS and call for the MET team (Crispin & Daffurn, 1998; Jones et al., 2006; Massey et al., 2014; Salamonson et al., 2006; Santiano et al., 2011; Subbe & Welch, 2013; Tee et al., 2008).

The literature has highlighted the barriers influencing the nurse in recognising and responding to clinical deterioration. These barriers include: education; the workload of the nurses; ward culture and communication; negative emotions; level of experience; and the track and trigger systems used (Andrews & Waterman, 2005; Bell & Redelmeier, 2001; Cioffi, 2000; Cox et al., 2006; Crispin & Daffurn, 1998; Donohue & Endacott, 2010; Endacott et al., 2007; Jones et al., 2006; Jones et al., 2009; Liaw et al., 2011; Maggs & Mallet, 2010; Massey et al., 2014; Massey et al., 2015; Odell et al., 2009; Quirke et al., 2011; Salamonson et al., 2006; Santiano et al., 2011; Smith et al., 2008; Tee et al., 2008; Wood et al., 2004).

Education of the registered nurse.

The lack of education and training was pinpointed as a significant factor in suboptimal care of the ward patient. Many studies have recommended that the healthcare team should be educated in the key elements of managing the deteriorating patient (ACSQHC, 2010; McQuillan et al., 1998; McGloin et al., 1999; NCEPOD 2005; NICE, 2007; Wood et al., 2004). There are numerous recommendations from several studies, including: a focus upon assessment skills; multidisciplinary training for the team management of deteriorating ward patient; inclusion of content in undergraduate nursing; and medical training programs (ACSQHC, 2014; Endacott et al. 2007; Liaw et al., 2011; Odell et al., 2009; Quirke et al., 2011; Wood et al., 2004).

The need to provide education for nurses to enable them to undertake competent and accurate physical assessment of the deteriorating patient was emphasized by several authors (ACSQHC, 2014; Cox et al., 2006; Donohue & Endacott, 2010; Odell et al., 2009). It was suggested that educating nurses was extremely important and that assessment needs to go beyond vital signs and include the ability to perform in-depth physical assessments (Liaw et al., 2011). A further recommendation was that nurses should be educated in the use of a systematic approach to patient assessment as well as improving knowledge of underlying pathophysiology associated with the signs of deterioration (Andrews & Waterman, 2005).

Educational strategies to improve: the nurses' roles in recognizing and responding to deteriorating patients; decision making; assessment skills; and clinical management skills was the subject of an extensive literature review. Whilst it identified the need for competencies to initially assess and autonomously manage the patient prior to arrival of expert help at undergraduate level, no studies specific to graduate nurses were identified (Liaw et al., 2011). Another strategy recommended to improve competencies was the rotation of healthcare professionals including nurses, through critical care areas. Additionally, hospital based postgraduate interdisciplinary courses with a focus on physiology was recommended (Andrews & Waterman, 2005; McQuillan et al., 1998).

Within the Australian context, the Australian Nursing and Midwifery Accreditation Council (ANMAC) are responsible for the accreditation of education providers and programs leading to registration as a nurse. The ANMAC provided the minimum standards required by higher education providers in the preparation of the nurse. The ANMAC standards, however, were very broad and did not provide guidance on the education required to manage the acutely ill or deteriorating patient (ANMAC, 2017).

The use of the "ABCDE" mnemonic has been advocated to guide nurses in undertaking systematic and prioritized in-depth physical assessment. There were a number of hospital based training courses available in Europe, Australasia and the USA to educate staff in the management the deteriorating patient. Most of the well-established programs emphasize the nurses' role as identifying deterioration, and working under direction as part of a team response to initiating interventions (Liaw et al., 2011).

The introduction and implementation of modified early warning systems (MEWS) have also been advocated as a way of improving patient assessment and vital signs recording. There was a 210% increase in the overall frequency of full vital sign set documentation during the first 24 h post-ICU discharge following the introduction of a MEWS observation chart and an associated educational program within an

Australian tertiary hospital. The introduction of MEWS was seen a very effective way of improving patient assessment in this group of patients (Hammond et al., 2013).

This current study provides an understanding of graduate nurse's role in monitoring the deteriorating patient. The study will provide insight and evidence of the level of monitoring undertaken, and their preparation to undertake the role. It will provide understanding of the educational needs of graduate nurses in the area of patient monitoring and suggest ways that this capability could be improved in other graduate nurses.

Workloads of the registered nurse.

Workloads, including nurse to patient ratios and nursing skill mix, have been identified as barriers to nurses recognising patient deterioration and calling for help. An analysis of 3,789,917 patient admissions to multiple acute care hospitals in Canada compared in-hospital mortality among patients admitted on a weekend with that of patients admitted on a weekday. Weekend admissions were associated with significantly higher mortality rates. It was concluded that the reduction in overall nursing and medical staffing levels at a weekend along with a lack of senior staff and increased workload could be possible explanations for the increase in mortality (Chaim et al., 2001).

A smaller study undertaken in the UK found similar issues, the total mortality was increased for admissions at night and in all out-of-hours periods. Again the study concluded that limited staffing levels and resources, as well as severity of illness were the explanations for the rise in mortality (Maggs & Mallet, 2010). Inadequate nurse patient ratios, were found to have a negative impact on the overall quality of patient assessment, leading to suboptimal care (Cutler, 2002; Endacott et al., 2007; Quirke et al., 2011). Skill mix including the collective knowledge, experience and skills of the nursing team, have been shown to influence the recognition and management of the deteriorating patient (Endacott et al., 2007). Increased workloads and inadequate nurse to patient ratios have had serious influences on the nurse's ability to apply their knowledge and skills to the management of the acutely unwell patient (Cutler, 2002).

The National Patient Safety Agency identified that nurses were often overstretched and frequently interrupted with too many patients in their care. It was felt that the high workloads and interruptions impacted negatively on the nurse's ability to adequately monitor and interpret patient information, and that patient deterioration was often missed (NPSA, 2007).

Ward culture & communication.

Ward culture and hierarchy have been identified as a barrier to the recognition and response to patient deterioration. Studies indicate that nurses continue to follow the traditional hierarchy opting to call the ward based medical team, leading to underutilization of the RRS despite activation criteria being fulfilled by the patient (Crispin & Daffurn 1998; Salamonson et al., 2006; Jones et al., 2006; Santiano et al., 2007). The traditional hierarchy has been linked to a sense of allegiance to the ward based medical team and to a fear of being reprimanded by senior ward staff for activating a MET call (Cioffi, 2000; Massey et al., 2014, Tee et al., 2008). Changing the culture of allegiance to traditional hierarchy and ward teams has been difficult to achieve (Tee et al., 2008).

The ability of the nurse to effectively communicate patient deterioration was found to often require the use of medical terminology and was dependent upon the nurse's knowledge, confidence and level of experience (Andrews & Waterman, 2005; Cox et al., 2006; Wood et al., 2004). This finding could be associated with the challenges faced by RNs when reporting clinical deterioration to medical staff as communication has been ineffective (Tee et al., 2008). Poor communication was been linked to a lack of knowledge, reduced confidence and limited experience of nurses and the increased risk of suboptimal care (Quirke et al., 2011). The differences in communication styles between ward nurses and medical staff, demonstrated a need to standardize communication between members of the healthcare team when discussing the patient's condition (Featherstone, Smith, Linnell, Easton, & Osgood, 2005). Education in communication skills have been suggested as necessary in developing nurses' skills, in reporting patient deterioration (Liaw et al., 2011). Clear and effective communication between all healthcare staff concerning the plan of care has been

highlighted as important in preventing suboptimal care of the deteriorating patient (ACSQHC, 2012; NICE 2007, NPSA 2007; Thomas, Bertram, & Johnson, 2009).

The need for clear structured communication during episodes of patient care has been emphasized in Australia by the ACSQHC (2012). Within the NSQHS framework, Standard 6 focused upon the transfer of information and communication during clinical handover. This type of handover was characterized as the transfer of professional responsibility and accountability for some or all aspects of care for a patient to another professional group. The ACSQHC emphasized the importance of clear communication to ensure timely, relevant and structured clinical handover that supports safe patient care. It was recommended that the use of structured and documented handover process would avoid miscommunication, and reduce the risk of adverse events from poor communication practices during patient care episodes (ACSQHC, 2012).

Negative emotions and self-efficacy.

Nurses involved in the management of the deteriorating patient have identified that negative emotions such as stress, anxiety, panic and uncertainty have impacted their decision making and resulted in a reluctance to activate the RRS and call for help (Cioffi, 2000; Massey et al., 2015). High levels of stress and anxiety are linked to low self-confidence and low levels of self-efficacy. This in turn has been correlated with poor clinical reasoning skills and nurses' poor performance (Munroe et al., 2015).

A number of studies have demonstrated that negative emotions influences the nurse's willingness to activate the RRS (Cioffi, 2000; Massey et al., 2014). Taking action following the recognition of patient deterioration and activating the RRS has been identified as problematic with some nurses apprehensive in calling for help and in providing initial intervention (Bucknall et al., 2013; Massey et al., 2015). The consequences of this delayed action in the recognition and management of the deteriorating patient are often disastrous. The "failure to rescue" has been frequently reported as a major cause of preventable hospital deaths and unplanned ICU admissions (Bobay et al., 2008; Hatler et al., 2009). The failure to take action has also

been linked to a nurse's negative emotion, such as apprehension, anxiety and feelings and a decrease in self-worth. These negative emotions have been identified as significant barriers, adversely influencing the nurse's recognition and response to the deteriorating patient (Bucknall et al., 2013; Massey et al., 2015).

The literature discussing a person's behavior and the actions taken, consistently link the individual's attitudes, with the actions performed. Social scientists have provided theories of planned behavior, where intentions and behaviours are a function of three basic determinants: personal attitudes; social pressure; and perceived behavioural control (Ajzen, 2005). It was posited that people intend to perform a behavior when they have a positive attitude, and when there is social pressure to perform, and when they have the opportunity and the means to undertake the behaviour (Ajzen, 2005). Behaviours can often be accurately predicted from an understanding of the person's intentions and their perceived behavioral control.

Behavioral control was seen as a key factor, linked to self-efficacy, which is defined as the individual's belief in and perception of their capability to perform a particular behavior (Ajzen, 2005; Bandura, 1977). Self-efficacy determines a person's decision to initiate behaviour, along with the amount of energy expended and the level of persistence in undertaking the task (Karabacak, Serbest, Kan Öntürk, Eti Aslan, & Olgun, 2013). Self-efficacy is related to self-confidence: the more self-confident the person is, the higher the level of self-efficacy a person possesses (Bandura, 1977; Pike & O'Donnell, 2010). A nurse's ability to act was shown to be influenced by their self-efficacy (Karabacak et al., 2013).

The attitude of the individual and the expectations of others are significant predictors of the individual's intentions, which generally correlate with behavior (Dwyer & Williams, 2002). People who believe that they have insufficient resources and opportunity to perform a certain behavior, are unlikely to form strong behavioural intentions to engage in an action (Ajzen, 2005). It is the person's intentions that determine the likelihood of an action being performed, since behaviour is consciously controlled (Ajzen, 2005).

High levels of self-efficacy have been linked to: enhanced technical skills; better assessment; and improved performance (Hollingsworth & Ford-Gilboe, 2006); enhanced clinical reasoning skills (Fry & MacGregor, 2014; Pottier et al., 2013); and leadership skills (Bobay et al., 2008; Brunt, 2005; Clarke, 2004). A nurse's positive self-perception has been shown to lead to successful performance and increased motivation to provide patient care in complex situations such as the management of the deteriorating patient (Pike & O'Donnell, 2010).

A descriptive study exploring the experiences of nurses making decisions to call emergency assistance found most nurses felt under confident calling for expert help (Cioffi, 2000). Many nurses stated they felt panic, nervousness and uncertainty. Nurses worried about doing the right thing, they wanted to be viewed as competent by medical colleagues and were concerned about being humiliated for making the wrong choice. Nurses actively sought the opinions of others and waited to see if the patient's condition deteriorated before calling the MET for help. The study identified that negative emotions adversely influence many nurses (Cioffi, 2000).

A further study, undertaken in a large Australian teaching hospital, found similar negative emotions were felt by nurses, prior to activating the RRS and calling the MET. Nurses described feelings of hesitation, uncertainty and panic prior to activating the RRS and calling the MET. Some nurses were fearful of being reprimanded and being humiliated for activating the RRS. Previous experience of being reprimanded by the MET personnel created coping responses that included hesitating in activating the RRS. This could delay the escalation of care for the deteriorating ward patient and acted as a significant barrier to RRS activation by nurses (Massey et al., 2014).

Experience of the registered nurse.

The expertise of nursing staff has also been identified as a contributing factor to the effective use of the RRS and the likelihood of nurses to call the MET. Experienced nurses were found to be more confident, assertive, and persistent in their goal of eliciting a medical response for the deteriorating patient (Andrews & Waterman,

2005). These attributes led to greater confidence in their decision to activate the RRS (Jones et al., 2009). In addition to these attributes, expert nurses utilized their knowledge, experience and intuition to facilitate the earlier recognition of warning signs of clinical deterioration (Cioffi, 2000).

Graduate nurses role in managing clinical deterioration

A plethora of studies existed that discussed general levels of competence on registration and challenges experienced during the transition from student nurse to graduate nurse on qualification (Buykx et al., 2011; Chang & Hancock, 2003; Cheeks & Dunn, 2010; Della Ratta, 2016; Duchscher, 2009; Ebert, Hoffman, Levett-Jones, & Gilligan, 2014; Ebright et al., 2004; Freeling & Parker, 2015; Higgins et al., 2010; McGaughey, 2009; Mooney, 2007; Ranse & Arbon, 2008; Theisen & Sandau,, 2013; Wolff et al., 2010). Generally, however, there was a paucity of research exploring the role of the GRN in the detection and management of the deteriorating ward patient and no studies that specifically investigated their role, key skills, or competencies required to manage the deteriorating patient. Thus, it was pertinent to investigate the RN role in recognizing and responding to the deteriorating patient.

A systematic literature review, concerning the RN role in clinical deterioration found that most studies evaluated the effects of RRS and the nurse's ability to detect deterioration and call for help, but no studies identified the explicit role of the RN in managing the deteriorating patient. It did, however, outline four main themes associated with managing the deteriorating patient, these were: recognition; recording and reviewing; reporting; and responding and rescuing. The review concluded that current research in the area of the RN role was generally insufficient and of a limited quality (Odell et al., 2009).

A further literature review aimed at exploring factors that influenced GRN preparedness for recognising and responding to patient deterioration, found that none of the studies specifically focused upon the GRN role. Rather studies in the review,

centred on: GRNs experiences of transitioning to the RN role; experiences of resuscitation; exploration of the RN experiences of MET, and RN decision making during a MET. Likely factors identified as impacting on the preparedness of GRN included: staff support; lack of nurse experience; overwhelming workload; holistic patient assessment; past experience; and lack of available resources. The review acknowledged that an absence of studies specifically focusing on the GRN experiences of recognising and responding to the deteriorating patient was a limiting factor in the literature review (Purling & King, 2012).

A phenomenological approach using semi-structured interviews with eight novice nurses explored the GRN experiences of caring for deteriorating patients during the first year of practice (Della Ratta, 2016). The study identified a discrepancy in the perception of the participant's ability, and the reality of providing care. Trusting relationships with preceptors, colleagues and educators were seen as crucial in their development (Della Ratta, 2016).The study provided insight into the lived experiences and emotions of the graduate nurse dealing with clinical deterioration. It highlighted the emotional rollercoaster they experienced and the support required to navigate these experiences. The study supported the literature focusing on self-efficacy as a key component, and the need to provide positive emotional support to the RN dealing with the deteriorating patient. It was, however, limited in that it used a small sample of participants and did not provide detail related to the expectation, role or competencies of the graduate nurse in the management of patients clinical deterioration.

Graduate registered nurse role challenges.

In the context of nursing, 'role' includes the attributes of the nurse that are socially accepted and expected by individual nurses, their peers, other health care professionals, the healthcare organisation and the wider community (Major, 2003). The issue of role and the need for role clarification has been highlighted as a significant factor impacting both experienced and new graduated registered nurses (Albarran, 2009; Lu et al., 2008). The clarification of the expectations of a specific role and the associated competence to undertake an ascribed role, are fundamental to

the success of role transition, role acquisition and role implementation (Albarran, 2009; Lu et al., 2008).

It is seen as essential that graduate nurses are able to practice safely and competently utilising knowledge and skills from their undergraduate education and applying those in the clinical environment to achieve the required patient outcomes (Hickey, 2009; Meechan et al., 2011). Nursing graduates are expected to work autonomously, dealing with increasingly complex patients, often with high workloads and increasingly complicated technology (Morrow, 2009). Role overload occurs when the demands of a particular role exceed the individual's capacity, and may be due to a combination of the complexity of the role, workload, limitations of time, competence or education (Chang & Hancock, 2003; Major, 2003). Nursing authorities and hospital managers expect that graduate nurses can demonstrate competence and critical thinking in the provision of patient care. There is also an assumption that graduate nurses are able to accept responsibility and accountability and practise independently in a safe and professional manner (Wolff et al., 2010; Nursing and Midwifery Board of Australia, 2016). The expectations of the graduate nurse, also extends to their capabilities of responding to the acutely ill patient (Purling & King, 2012).

The literature described GRNs as becoming rapidly immersed in nursing teams in the provision of complex care. This involvement often involved responsibility for making key decisions about patient management (Burger et al., 2010; Ebright et al., 2004). Compounding the growing complexity of the GRN role was the increasing level of acuity in the hospital setting and the rising numbers of critically ill ward patients (ACSQHC, 2014).

The process of transition from student to GRN was recognised as a stressful process (Gerrish et al., 2007). Graduate nurses worry about the increasing level of responsibility, their ability to keep patients safe and an ability to integrate what they have learnt into their clinical practice (Kaihlanen, Lakanmaa, & Salminen, 2013). As previously noted, stress and anxiety have been shown to lower self-confidence, leading to low self-efficacy, and has been correlated with poor clinical reasoning skills and nurse's poor performance (Casey et al., 2004; Munroe et al., 2015).

Within the literature it is clear that a lack of clarification concerning the expectations of a specific role can lead to a number of problems. These include the issues of reality shock, role overload, associated role stress and reduced self-efficacy (Bandura, 1977; Brief et al., 1979; Brookes, Davidson, Daly, & Halcomb, 2007; Casey et al., 2004; Duchscher, 2009; Goode, Lynn, McElroy, Bednash, & Murray, 2013; Higgins et al., 2010; Horsburgh, 1989; Kramer et al., 2013; Lim, Bogossian, & Ahern, 2010; Meechan et al., 2011; Mooney, 2007; Valdez, 2008).

Role theory defines the behaviour of individuals in social situations, and how others perceive these behaviours (Brookes et al., 2007). The nursing literature was replete around the concept of 'role' and the issues of role stress, role ambiguity and self-efficacy (Bandura, 1977; Higgins et al., 2010; Kramer, 1974; Kramer et al., 2013; Mooney, 2007; Pike & O'Donnell, 2010). It included descriptions of the behaviours, characteristics, norms and values of a person or position (Major, 2003). Role ambiguity refered to a lack of clarity of the projected role, indeterminate expectations of the role, diffuse responsibilities and uncertainty about sub-roles (Horsburgh, 1989; Kramer et al., 2013; Schuler et al., 1979).

Lack of role clarification can lead to: lower productivity; tension; anxiety; dissatisfaction; ill health; absenteeism; increased staff turnover; and poor quality patient care (Callaghan et al., 2000; Chang & Hancock, 2003; Lambert & Lambert, 2001; Majomi, Brown, & Crawford, 2003). Moreover, disparity between the idealistic GRN's view of nursing learnt in academia, and the bureaucratic hospital system, has created conflict for the GRN. It has also been associated with the experience of reality shock (Kramer et al., 2013). This issue and the miss match between GRNs' expectations and clinical reality, was the subject of several studies. It was recognised that reality shock often lead to feelings of: insecurity; a lack of self-confidence; lower self-efficacy; frustration; and stress (Casey et al., 2004; Higgins et al., 2010; Jasper, 1996; Munroe et al., 2015; Mooney, 2007). The feelings of disappointment were clearly noted in some GRNs and was linked to a lack of time for patient care, conflicting priorities and values, and unexpected levels of responsibility (Amos, 2001; Rochester & Kilstoff, 2004; Whitehead, 2001).

Graduate programs.

In response to the recognition of the difficulties GRNs faced during their transition to RN, many countries including Australia introduced GRN programs. These programs were designed to offer additional support for GRN to facilitate the consolidation of undergraduate preparation. These objectives were achieved through supported practical experience and included the integration of theory into practice focusing on critical thinking, clinical competence, and interdisciplinary teamwork skills (Cubit & Leeson, 2009; Levett-Jones & Fitzgerald, 2005). Graduate nurse programs often included regular education sessions, a mentorship component, reduced workload and peer support (Anderson, Linden, Allen, & Gibbs, 2009). Studies supported the evidence that GRN transition programs, help to improve recruitment and retention, promote job satisfaction and develop confidence and competence (Anderson et al., 2009; Goode et al., 2013; Ulrich et al., 2010; Varner & Leeds, 2012).

Despite participation in a GRN transition program, role transition from student to professional nurse continues to be a difficult process for many newly qualified nurses (Dyess, 2009; Evans, Boxer, & Sanber, 2008). The care of the deteriorating ward patients has been highlighted as a particular clinical challenge (Purling & King, 2012). How a nurse recognizes and responds to a deteriorating patient is complex process that requires critical thinking, rapid decision-making and skilled judgment. This process may be difficult for the GRN caring for the deteriorating patient and was recognized as perhaps one of the greatest challenges facing first year registered nurse (Purling & King, 2012). Without understanding the role and what is expected of graduate nurses in the context of clinical deterioration, it is extremely difficult to prepare GRN to undertake this role. This current study aims to investigate the role and competencies of the GRN in managing the deteriorating patient.

Graduate registered nurse competency.

Competence was reported as a crucial attribute to ensuring quality, ethical and safe nursing care (Kendall-Gallagher & Blegen, 2009). The competency of nursing staff directly influences the health and safety of all patients (Axley, 2008). Nurses and midwives are mandated to be competent when they register and to maintain professional competence by undertaking annual continued professional development (Nursing & Midwifery Board of Australia; 2016). A lack of competence in nursing staff was linked to negative patient outcomes (Nilsson et al., 2014). As healthcare becomes increasingly complex, it is essential that nurses deliver safe quality care to reduce the number of adverse patient outcomes (Church, 2016).

An abundance of literature exists related to competence in the nursing profession, yet there is little consensus as to how to define competence and how to measure the concept (Axley, 2008; Flinkman et al., 2017; Lima et al., 2014; Lima et al., 2016; Yanhua & Watson, 2011). Competence has been defined as 'the knowledge, skills, ability and behaviors that a person possesses in order to perform tasks correctly and skillfully' (O'Shea, 2002, p. 175). It has further been was referred to as a desired outcome of nursing education and professional development (Alspach, 2008; Lejonqvist, Eriksson, & Meretoja, 2016; Maynard, 1996).

Despite the lack of consensus on the definition of competence, common themes have been uncovered in the literature. These themes comprise: sound judgment; professionalism; and the possession of adequate knowledge, skills and attitudes for a particular purpose (Axley, 2008; Church, 2016; Smith, 2012; Takase & Teraoka, 2011; Valloze, 2009). The International Council of Nurses (ICN) suggested competence was the ongoing ability of a nurse, to integrate and apply knowledge, skills, and judgment to perform safe, ethical clinical practice in a designated role and setting (International Council of Nurses 2006).

Historically, nursing competence was associated with the technical aspect of performance with nurses engaged in a combination of technical and non-technical skills. These included skills such as assessment of vital signs, therapeutic

communication, and the management of haemodynamic monitoring (Axley, 2008). Competency was also used also as a measure of advanced practice, technical skills and knowledge of nurses in the development of advanced practitioner roles (Halcomb, Stephens, Bryce, Foley, & Ashley, 2016).

The term competence has been aligned with the preparation and transition of student nurses into effective graduate nurses and has been used as a measure of performance and progression (Levett-Jones & Fitzgerald, 2005; Lima et al., 2016). Numerous studies have explored the general competence of GRNs from a variety of perspectives: including clinical performance; experience and expectation; strengths and weaknesses; and retention in the workplace (Lima et al., 2014). Some of these studies have suggested that GRNs are well prepared and are practice ready (Wolff et al., 2010). The majority of studies, however, raised concerns with regards to the level of competence demonstrated by GRN and their preparedness for clinical practice. Areas of difficulty included clinical skills, communication and critical thinking (Duchscher, 2009; Evans et al., 2008; Hartigan et al., 2010; Missen et al., 2016; Theisen & Sandau, 2013).

Whilst there is a plethora of literature discussing the levels of competence of graduate nurses and the need to improve key areas of competence, no studies could be identified that have explored the levels of competence or related knowledge, skills and attitudes required by either GRNs or experienced RNs in managing the deteriorating patient. The aim of this current study is to redress this gap.

Currently within Australia, the only recommended competence for registered nurses dealing with acutely ill hospital patients is that of basic life support and resuscitation (ACSQHC, 2011). Nationally, there is a clear mandate for improving all healthcare practitioner's clinical competence in the recognition and response to clinical deterioration. This focus requires a clarification of the expected role of all staff involved in the response to and management of the deteriorating patient. It is particularly important for GRN to have a clearly defined role and expectation in their time of transition. A clear set of acute care competency standards that explicitly define the specific knowledge, skills, attitudes, abilities and behaviours required to manage

the deteriorating patient ,would provide clarity and clearly articulate the scope of practice of the GRN. This study will identify relevant acute care competencies and an understanding of the GRN's role in recognizing and responding to the deteriorating ward patient.

Conclusion

It is clear that GRNs are expected to care for deteriorating ward patients. Considerable attention has been directed towards the problem of clinical deterioration in the hospital patient both nationally and internationally. Nationally there has been a renewed focus on the need for all healthcare providers to possess appropriate competency, knowledge, skills and attitudes to manage the deteriorating ward patient. Warning signs of clinical deterioration are evident in the patient's physiology many hours prior to adverse events. The recognition and management of clinical deterioration is often delayed leading to suboptimal care, increased risk of adverse events, unplanned ICU admission and increased mortality. Rapid response systems have been developed to track physiological decline and trigger a timely and appropriate response for the deteriorating patient.

Nurses have a major role in the detection and management of the deteriorating patient, although the literature lacks clarity as to the expected role of both the experienced registered nurse and the graduate registered nurse. Expectations of the registered nurse include the recognition of physiological decline, the summoning of help, and the provision of basic intervention. There is evidence that nurses sometimes fail to recognise clinical deterioration and are reluctant to call for help. Factors including competency, role ambiguity, self-efficacy, self-confidence, workload, resources and support influence the registered nurse's ability to detect and respond to clinical deterioration. There was a recognition that the transition from student, to qualified nurse was a difficult period with stress and uncertainty rife amongst graduate nurses.

A significant gap exists within the literature concerning the graduate registered nurse and the role undertaken in the management of clinical deterioration of the patient. It is the intention of this current study to redress this existing gap in the literature. As far as is known, this study will be the first mixed methods study to provide evidence of the specific role undertaken by graduate nurses in the management of patient deterioration. It will be the first study to identify and measure the acute care clinical competencies used and the level of working undertaken by graduate nurses when dealing with the deteriorating ward patient. The study will provide further insight into the factors that impact the graduate nurses' role in managing the deteriorating patient. It will explore strategies such as utilizing competency standards, to improve the capabilities of graduate nurses to undertaken their clinical role.

In closing, this chapter identified the problem of patient deterioration, with many national and international studies recognising its significance in influencing the mortality and morbidity of patients in the ward environment. Whilst RRS has been implemented as a strategy to provide better patient care, it would seem that RNs often experience barriers in recognising and responding to the deteriorating patient. Of concern are the expectations of the GRN role and their competencies in managing patients deteriorating condition. It would seem that GRNs are particular vulnerable to the negative attitudes of other healthcare professionals regarding their actions in these situations.