

## Non-technical skills required to recognise and escalate patient deterioration in acute hospital settings

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**Exploration of the non-technical skills nurses require to effectively recognise and escalate patient deterioration in an acute hospital setting.**

Abstract

Through the presentation of a literature review, this article aims to explore the “non-technical” skills nurses require to effectively recognise and escalate patient deterioration in an acute hospital setting. Literature was searched using electronic databases between 2009 and 2017. Keywords such as; nurse, deterioration, recognition, and assessment. Thematic analysis was used to interpret this data. The main conclusion is the need for a greater focus within nurse training, and health care generally, on situational awareness as this has been linked to improved safety for patients.

Keywords: nursing; recognition of deterioration; patient deterioration; patient assessment; nurse education; nurse training; intuition; situational awareness; communication; nontechnical skills

Introduction

Recognition of patient deterioration is a key role of the registered nurse. In many settings, it is the nurse who has the most consistent patient contact and subsequently recognises that a patient’s condition has worsened.

We know that patients admitted to acute hospital wards are at risk of deterioration which can lead to admittance to a high dependency unit or even death (National Patient Safety Agency (NPSA) 2007b, Findlay et al 2012, McGinley and Pearse 2012) and research shows that many adverse events are preventable with deterioration identified in the hours leading up to it (NPSA 2007a, Findlay et al 2012). Observation through measurement of physiological vital signs and early warning score (EWS) charting is mandatory for all adult

patients in acute hospital wards. They are the first key step in identifying deterioration but rely on the user understanding their significance (National Institute for Health and Care Excellence (NICE) 2007) and escalating if necessary.

The Royal College of Physicians (RCP) (2012) produced the National Early Warning Score (NEWS) to standardise EWS stating they should be used as an objective tool to supplement clinical decision making, however research shows that often EWS substitute for judgement rather than augment it (Purling and King 2012, McDonnell et al 2013, Brier et al 2015). The Resuscitation Council (2015) provide guidance for assessing acutely unwell patients, the A-E approach.

Despite these guidelines poor recognition of deterioration remains significant. The NPSA (2007a) report into safer care for acutely ill patients indicated that 11% of serious incidents were due to deterioration not being adequately recognised or acted upon. More recently Findlay et al's (2012) report into patients who received cardiopulmonary resuscitation (CPR) in hospital, found the arrest was predictable in 64% of cases, and avoidable in 38%. Many reasons were cited for failings in recognition, including; poor communication, lack of education and experience, and lack of teamwork (NPSA 2007b). Pre-registration standards in England (Nursing and Midwifery Council (NMC) 2010) stipulate that graduate nurses must be able to assess and manage patients who are at risk of deteriorating, have the ability to accurately measure, interpret and respond to clinical observations, incorporating training in both NEWS (RCP 2012) and the A-E approach (Resuscitation Council 2015). Although training has improved in early warning scoring, there is evidence that graduate nurses remain unprepared for adequate recognition and escalation of deteriorating patients (Purling and King 2012).

Flin et al (2007) define non-technical skills as the cognitive, social and personal skills that augment technical skills to enable safe practice, however pre-registration training continues to focus on technical skills for both nurses and doctors (Pearson and McLafferty 2011) which has been criticised by the House of Commons health committee (2009).

This literature review aims to identify and explore the non-technical skills nurses require to effectively detect and escalate clinical deterioration of patients in an acute hospital setting to inform current practice and education standards and improve patient safety.

Methodology

## Search Strategy

The literature review was conducted via a systematic search using the University of Wolverhampton database search engine "Summon" incorporating the databases; Wiley Online Library, PubMed, ScienceDirect, Medline, CINAHL and Academic Search Complete. Key words included; nurse, recognition, deterioration, non-technical skills, observation and assessment. Key words were used separately and in combination. Results were narrowed using discipline and subject terms; nursing and deterioration.

## Inclusion and Exclusion Criteria

Articles were excluded for; non-researched based articles, studies outside acute hospitals, studies in critical areas, studies concerned with student nurses, studies more concerned with the use and advantages of EWS, any study that did not discuss non-technical skills and studies focused on paediatrics. Inclusion criteria incorporated worldwide articles, as clinical deterioration and nursing skills are not applicable to only one nation, articles published between 2007-2017 to incorporate contemporary evidence, and only academic peer reviews journals with online availability to ensure reliability of results. The remaining articles were analysed by abstract to ascertain their relevance to the subject matter and applicability for inclusion in the literature review, duplicates were also disregarded. The selection process is illustrated in table 1.

## Critical Appraisal

All of the 20 remaining studies consisted of qualitative data from mixed method studies or literature reviews, therefore the critical appraisal skills programme (CASP) checklists were employed to ascertain validity and reliability. 14 studies were selected for inclusion in the review, varying in publication date from 2009 to 2016 and originating from the United Kingdom, the United States, Australia and Holland. These are illustrated in table 2.

## Data Extraction

Thematic analysis was used to identify themes within the studies. All studies were carefully read, relevant findings were highlighted and inputted onto a data extraction table with a summary of the articles' results. Findings were highlighted on the table for ease of reference

and grouped into major themes that strive to fulfil the aim of the review. The three main themes were; (1) intuition, (2) clinical judgement, and (3) communication.

### Intuition

Nurses' often speak of "having a sense" that something is not well with a patient, even before clear physical signs manifest and many of the studies suggest that effective detection of deterioration is initially heavily linked to intuition, or tacit knowledge, which can be difficult to define. Polanyi (1962) describes tacit knowledge as knowledge that is acquired through practice and experience, it is difficult to communicate, is specific to circumstance, and the individual is often unaware of its existence.

Two of the qualitative studies provide quoted descriptions of nurses' intuition; in Hart et al (2016) a nurse described having a "gut feeling" that something was not right and in McDonnell et al (2013) a nurse described having a "sixth sense". The systematic review by Odell et al (2009) concluded that intuition is central to detection of deterioration, however Brier et al (2015) expanded upon this and aimed to produce an algorithm to aid in clinical decision making which attempted to quantify what nurse intuition entailed, stating that the overriding theme was that of complete systematic assessment. They suggest using multiple data sources, knowing the patient, and having a knowledge of disease and recovery trajectory allows the nurse to build a mental picture in their mind and predict how the patient "should" present (Brier et al 2015). This is echoed by Liaw et al's (2011) review into educational strategies, stating that nurses often use subjective data, and past experiences and knowledge to aid in recognition of deterioration, which is important remember when considering how nurses escalate concerns to doctors and other colleagues, and how their "gut feelings" about a patient should be taken seriously in the absence of other objective data.

Many of the studies suggested that knowing the patient is essential in providing the nurse with the ability to detect subtle changes leading to deterioration and is only possible through continuity of care and effective handover communications between staff members (McDonnell et al 2013, Brier et al 2015, Hart et al 2016). Liaw et al (2011) agree that nurses should be involved in the care of their patients allowing them to assess over time, however due to changes in role of the registered nurse they are undertaking less patient care and therefore monitoring, and recognition of deterioration, often falls to less qualified staff.

The abilities of inexperienced nurses were heavily criticised within the literature. Purling and King (2012) found that inexperienced nurses would miss subtle cues that feed intuition due to lack of confidence in their ability and generally had an overreliance on equipment and vital signs, similarly to Brier et al (2015) who found that less experienced nurses tracked vital signs alone in lieu of a complete objective systematic assessment. Nurses in McDonnell et al's (2013) study knew when to follow their intuition, disregarding normal vital signs, which was concurrent with Hart et al's (2016) findings, who also suggested that without close assessment and intuition, deterioration on acute wards can be missed as patients with normal vital signs may not be flagged for attention by support staff as they may not recognise the more subtle signs. The use of vital sign monitoring was also noted as different between inexperienced and experienced nurses, with experienced nurses using objective data tools such as EWS to validate intuitive feelings, rather than relying on this to be the first clue to deterioration (Odell et al 2009, Douw et al 2015, Mok et al 2015), and to provide objective data to use during escalation. Findlay et al's (2012) study showed that many in hospital cardiac arrests were predictable and with the correct use of an EWS and a full systematic assessment, incorporating nursing intuition, they could have potentially been avoided.

The ability to draw upon prior experience of deterioration events allows nurses to manage subsequent events better than those who have not (Odell et al 2009, Liaw et al 2011). Hart et al's (2014) study demonstrated a positive correlation between experience and perceived self-confidence when faced with a deterioration event, mirroring Endacott et al's (2015) study that found both students and qualified nurses drew on their previous experiences when dealing with simulated deterioration, but having greater prior experience and knowledge allowed the qualified nurses to draw on "tacit knowledge" and therefore performing better overall.

The existing NEWS and NEWS2 (RCP 2012, RCP 2017) systems do not incorporate "nurse worry" or intuition within its scoring algorithm. Douw et al's (2016) study compared adding "nurse worry" as an indicator in an EWS system and compared the results of unexpected admissions to high dependency units or patient death, and found that by considering "nurse worry" poorer outcomes were statistically lower. These findings emphasise the significance and reliability of nurse intuition in deterioration events.

## Clinical Judgement

Effective clinical judgement relies heavily on nurses' explicit knowledge, drawing upon intuition and analytical thinking (Jasper et al 2013). Explicit knowledge is described as consisting of facts and information and can be documented and communicated easily (Wyatt 2001). Liaw et al (2011) suggest that nurses are central to making decisions leading to appropriate interventions following patient assessment, and experienced nurses often act beyond medical direction and provide advice to junior medical staff. Hart et al (2014) confirm this as they found that good clinical reasoning skills were associated with perceived self-confidence and overall experience, and these nurses were able to initiate interventions following identification of deterioration.

Endacott et al (2012) explored clinical judgement and decision-making skills using simulated deterioration scenarios and reflective interviews among nurses in a rural hospital. Their findings indicate that nurses who scored highly conducted thorough systematic assessments of the patient, including a history, correlating with longer service as a nurse. They also found that independent decision making was a stressful process, and when faced with uncertainty the nurses initiated many interventions autonomously before escalating the situation, this emphasises the importance of teamwork (Endacott et al 2012, Hart et al 2016).

The use of EWS systems featured heavily in the literature. Donohue and Endacott's (2010) study found that EWS systems were most useful for inexperienced nurses, however there was a lack of recognition of vital sign trends and changes in physiological status were often ignored if the EWS was not a trigger value. Experienced nurses with a greater knowledge of disease and deterioration processes would recognise these trends and provide a further systematic assessment (Donohue and Endacott 2010). McDonnell et al (2013) also obtained similar data within their qualitative interviews, discussing how nurses found EWS systems unreliable for patients with chronic illnesses, as often they would trigger an unwarranted referral. Experienced nurses would exercise clinical judgement to not escalate based on their knowledge of pathophysiology of these conditions, whereas an inexperienced nurse may not.

Teamwork, in relation to clinical judgement, was explored in several of the studies. Brier et al (2015) found that nurses strived to validate concerns with others to confirm their assessment of the patient, which is concurrent with the findings in Hart et al's (2016) study

which stated that nurses' behavioural skills included communication with team members and delegation of work load. Purling and King's (2012) literature review drew similar conclusions, finding that collaborative problem solving and consultation with experienced colleagues improved the assessment process. Endacott et al (2015) also found that by comparison, experienced nurses had a greater ability to work as a team than student participants, denoted by an outspoken leader, further emphasising the benefit of practise experience in deterioration events. There were however some barriers to teamwork that were noted; fear of reprimand or looking "stupid" was cited by Purling and King (2012), Hart et al (2016) found there was a lack of clarification over roles and responsibilities and timely input of members of the multidisciplinary team members, which was also within Odell et al's (2009) literature review where nurses expressed difficulties in getting a doctor to attend to a patient.

Fore and Sculli (2013) suggest that lack of situational awareness is the most common cause of adverse events and is frequently used within safety initiatives in industries such as aviation, however within nursing it remains poorly understood. Purling and King (2012) found that graduate nurses lacked the ability to grasp the "bigger picture" which was linked to poor preparation for practice resulting in limited clinical reasoning skills. Endacott et al's (2015) simulated study found that the teams, both student and qualified nurses, lacked shared situational awareness as participants became fixated on one aspect of the scenario, forsaking others, leading to poor decision making and potentially poor outcomes. Brier et al (2015) found that there was a distinct lack of systematic approach to patient assessment and therefore set out to develop a clinical algorithm to aid nurses' decision making through critical thinking, providing them with a tool to aid in situational awareness. Although their tool had limited testing, it proved successful and nurses agreed that it would aid in the surveillance of patients.

## Communication

Effective communication during deterioration events is already well documented concerning use of the SBAR (situation, background, assessment and recommendation) communication tool together with the NEWS system (RCP 2012) and within NICE Guideline CG50 (NICE 2007). The SBAR tool and EWS systems are discussed within the selected articles (Liaw et al 2011, Brier et al 2015), however they constitute technical skills so do not form

part of the overall findings, however non-technical skills used to successfully execute a handover are.

An overwhelming trend within the articles is that nurses often found difficulty in obtaining medical reviews for patients whom they were intuitively concerned about if they did not have objective data to back this up (Brier et al 2015). This is compounded with a difficulty obtaining a review from medical staff when escalating over the phone (McDonnell et al 2013). Doctors included within Martland et al's (2016) study stated that nurses often did not use structured communication when escalating patients and that it was "haphazard and non-prioritised". This complex relationship between nurses and doctors when escalating patients was discussed in Odell et al (2009) which found difficulty for nurses in communicating subtle changes that were not always quantifiable, knowing they should use technical language to persuade doctors, which wasn't always possible.

Within Brier et al (2015) study nurses suggested that escalation tended to be more successful if they could "package" findings and pair intuitive feelings with some objective sources of data, but this required the skill to be able to stress the urgency of a situation and sometimes required validation by a more senior member of staff to gain a review. Liaw et al (2011) also found that nurses' escalation reports often incorporated far too much irrelevant subjective information and used everyday language, which failed to convey the seriousness of the situations they were confronted with. They suggested that nurses should provide quantifiable evidence of physiological deterioration using technical language and knowledge of disease and recovery processes to provide reasoning. Donohue and Endacott's (2010) study assessed communication of deterioration to critical care outreach teams within acute wards and found a disparity between ward nurses perceived skills and how outreach viewed their handover. Some ward nurses stated that they ensured they had objective evidence from EWS charts to effectively convey the seriousness of the situation, however the outreach nurses suggested that the ward nurses often could not answer the questions they asked to gain information about the patient. It was suggested that the information was often second hand and had been delegated which could be attributed to workload and staffing levels (Donohue and Endacott 2010).

Having confidence and conviction when escalating a concern was cited by several authors. Within Hart et al's (2014) study less than 50% of the nurses felt confident handing over a patient or responding to concerns during an emergency. Those that did generally felt more

self-confident in an emergency and were more likely to exert leadership abilities, once again these traits were consistent with experienced nurses. Donohue and Endacott (2010) found that outreach nurses reported better handovers from wards with a better leadership reputation. Liaw et al (2011) suggested that experience bred confidence and assertion when escalating a patient, but inexperienced nurses often feared escalating wrongly as this could bring their reputation into question and would therefore seek assistance from peers prior to requesting a review.

Martland et al's (2016) study aimed to produce a theory relating to clinician communication prior to a rapid response callout which led to some interesting findings. When doctors were contacted and informed of concern for a patient, they would often dismiss the concern with little to no explanation leaving the nurse to continue monitoring the patient themselves or calling a rapid response call if their concern was beyond their coping (Martland et al 2016). This was echoed by Puling and King (2012) who found that nurses were disregarded and left unsupported which led to a very stressful situation. Additionally, they found that experienced staff often preferred to communicate with other experienced staff as they understood priority, terminology and had mutual respect. However, the senior nurses and doctors generally only worked during office hours leading to junior staff on both sides managing patients at night leading to more emergency calls as nurses felt that junior doctors would not be able to cope with the needs of their patients (Martland et al 2016). This could go some way to explaining the findings of the literature reviews included who all cited fear of reprimand or looking "stupid" as a barrier to inexperienced nurses escalating deterioration in a timely manner, and preferring to wait it out to see if the patient deteriorates further (Odell et al 2009, Liaw et al 2011, Puling and King 2012). In addition to this fear, Puling and King (2012) found reports of negative comments being made from senior staff to inexperienced nurses when mistakes were made, which could further compound this issue.

The EWS system was noted to be of great use in providing objective information to provide an effective escalation handover (Mcdonnell et al 2013) as these detailed algorithms can provide confidence and authority during escalation for those who lack confidence (Odell et al 2009).

## Conclusion and Recommendations

Evidence indicates that non-technical skills required to effectively recognise and escalate patient deterioration lie in the knowledge and experience of the attending nurse. Intuitive knowing is repeatedly linked to the ability to draw upon past experiences of similar situations providing the nurse with confidence to act appropriately. Decision making was linked with situational awareness, explicit knowledge of disease pathophysiology and recognition of trends, and effective communication was reliant upon confidence which came from experience. The use of a validated, standardised EWS, coupled with a well-trained nurse able to use their intuition and clinical judgement, is vital to detecting and arresting patient deterioration.

This clearly has implications for both pre-registration education and ongoing support and training for registered nurses in practice. A thorough understanding of disease processes and pathophysiology gives nurses an insight into patient deterioration, and should be a high priority for those involved in nurse preparation and training. Care providers should be working in conjunction with training providers to ensure effective dissemination and training in the use of EWS scoring systems. There is a very strong argument that care providers should be working together on a regional and national basis to work towards implementation of standardised EWS such as NEWS2 (RCP, 2017).

With the publication of new standards for pre-registration nurse education from the NMC, educators must also be mindful of how nurses' physical assessment capabilities can be improved. As the studies show continuity of care has an overriding impact on the nurse's ability to utilise tacit knowledge to recognise the early stages of deterioration. With staffing levels continuing to be sub-par with an estimated 15,000 nurses short (NHS Improvements 2016) this gives further reinforcement for graduate nurses to be more fully equipped with effective non-technical assessment skills in addition to the technical skills already taught.

Nurses intuition, whilst a powerful marker of patient deterioration, should always be coupled with EWS systems, which are a useful tool for nurses and provide extra support for inexperienced staff. Inclusion of a "nurse worry" indicator within the scoring system could aid in reducing poor outcomes by allowing nurses to escalate patients for whom they may not be able to quantifiably communicate to medical staff.

Effective clinical judgement rests heavily on situational awareness which was shown to be lacking in graduate nurses (Purling and King 2012). Factors affecting situational awareness can be individual or systemic and awareness of both is important, as a nurse may know the

correct action to take but social factors may prevent them from escalating appropriately for fear of reprimand. More training in the form of simulation with focused debriefing incorporating healthcare specific situational awareness training, could provide rehearsal of the non-technical skills emerging from the literature which could be incorporated within both pre-registration programmes and hospital-based education. Within health care trusts this training could be interprofessional ensuring that all levels of patient facing staff receive adequate training in non-technical skills, which would also facilitate removing communication barriers between professions and skill levels. It is clear that for effective team working to take place, teams should be trained together in a standardised approach. Nurses, healthcare assistants and medical staff should all be using a shared mental model and approach to recognising and escalating patient deterioration.

Overall, the message is clear, non-technical skills are vitally important for maintaining patient safety and the recognition of deterioration. Greater consideration should be given to enhancing the nurses' assessment skills, acknowledging their voice in the escalation of concerns and prioritising training for all healthcare staff in simulated scenarios to enhance tacit and explicit knowledge and to breed confidence in ability.

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