Are early warning scores the only way to rapidly detect and manage deterioration?

Rapid response systems, including early warning scores, are widely used to detect deterioration but a recent systematic review questions this approach.

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ABSTRACT Odell M (2010) Are early warning scores the only way to rapidly detect and manage deterioration? Nursing Times; 106: 8, 24-26.

A systematic literature review recently highlighted the complexity of nursing practice in terms of detecting and managing deteriorating ward patients (Odell et al, 2009). The findings suggest that rapid response systems, including early warning scores, may not be the only solution to the problems of detecting and managing signs of deterioration. This article summarises the findings of this review.

INTRODUCTION

Patients in hospital can experience unexpected physiological deterioration that can lead to critical illness, admission to the intensive care unit (ICU), cardiac arrest and/or death.

Deterioration can be detected in physiological signs such as pulse, blood pressure and respiratory rate, or symptoms, such as a deteriorating mental state.

While ward nurses can monitor and detect these signs and symptoms as part of routine practice, it is possible to miss or misinterpret them. This problem was the subject of a number of critical care studies (McGloin et al, 1999; McQuillan et al, 1998; Schein et al, 1990).

One of the solutions was to introduce rapid response systems (RRSs), which have evolved sporadically and independently in Australia, England and the US (DeVita et al, 2004; Goldhill et al, 1999; Morgan et al, 1997; Lee, 1995). RRSs generally consist of one or more physiological signs being “tracked” which, when predetermined ranges are breached, trigger a response from a critical care team, who then attend and assess the patient. Different types of RRSs have evolved, including:

- Single parameter systems: one abnormal vital sign triggers a response (Lee et al, 1995);
- Multiple parameter systems: a combination of vital signs or symptoms trigger a response (Goldhill et al, 1999);
- Aggregated systems: selected vital signs are scored according to their range of abnormality, and the scores are totalled (Morgan et al, 1997).

These RRSs are more commonly known in the UK as early warning scoring systems. The aggregated early warning score (EWS) is the most commonly used in the UK (Department of Health, 2003).

EWS systems have a range of designs and models across hospitals, with differences in the vital signs used, their ranges and the availability and make up of the response teams (DH, 2003).

Various UK government agencies have recommended implementing EWS systems (National Patient Safety Agency, 2007a; NICE, 2007; National Confidential Enquiry into Patient Outcome and Death, 2005). In spite of these measures, timely detection and appropriate management of deteriorating ward patients still remain a problem. A study analysing patient safety incidents reported that a number of patients had died because their deterioration had not been recognised or acted on (NPSA, 2007b). The NCEPOD (2005) found that EWSs can be incomplete or that considerable delays could occur in calling for expert help.

Personal experience has identified that, even where a comprehensive hospital wide EWS system is in place with a response team available 24 hours a day, some patients still fail to have timely vital sign observations recorded. In addition, abnormal signs and symptoms are not recognised, EWSs are not properly completed and expert teams are not used effectively.

More in depth investigation to identify the factors that enhance or hinder high quality patient care in this field is required if we are to deal with this issue effectively and find ways to optimise patient care and safety.

DETECTING DETERIORATION

Both NICE (2007) and DeVita et al (2006) developed a model for RRS structure and a chain of response that sets out the ideal course of action for deteriorating hospital patients. Both models start with the deterioration event being recognised.
While healthcare assistants or patients and their families may recognise deterioration, most commonly it is ward nurses, as they have the most frequent contact with patients. Obvious signs of collapse should be easily detected, but it is the more subtle onset of deterioration – signalled in changing vital signs and symptoms – that ward nurses are in a central position to detect. They should then initiate appropriate interventions. The nurse’s role is to care for patients, promote healing and prevent complications – an essential part of this role is observation.

EWS systems rely on the regular observation of patients’ general demeanour and assessment of their physiological state using regular and frequent monitoring and recording of vital signs. When predefined and documented abnormality is detected in these signs and symptoms, patients are referred to more senior clinical experts for assessment and management.

However, findings from a recent systematic review (Odess et al, 2009) have shown that the process for detecting and managing deterioration is highly complex and is influenced by many factors including:

- Environmental and cultural influences;
- The complex relationship between nursing and medical staff;
- Increased pressures on resource and staffing;
- The quality of training and education provided to healthcare staff;
- Healthcare professionals’ experience.

The effectiveness of EWS systems is based on two basic assumptions:

- Nurses with a range of skill and experience regularly record patient observations and use the pre-agreed EWS ranges to determine whether the patient is deteriorating;
- If deterioration is determined in this way, the nurse refers the patient to more expert clinicians.

The most interesting findings to come out of the literature review were that these assumptions were not evident in practice (Odess et al, 2009).

RECORDING OBSERVATIONS AND RECOGNISING DETERIORATION

An essential part of the nurse’s role is to record patients’ vital signs or observations as required or at regular intervals throughout the day, in order to monitor their progress and evaluate the effects of interventions.

The majority of vital sign recordings are planned at regular intervals and, as a result, may become governed by ritual and routine. Completing observations may be viewed incorrectly as unimportant and insignificant when compared with other more complex nursing roles (Hogan 2006; Wheatley, 2006). One result of this is that routine vital sign recording is often delegated to healthcare assistants and, even when registered nurses do undertake it, they are frequently interrupted and unable to spend enough time with patients (Wheatley, 2006).

In addition to the confusion about who should record vital signs, there is little agreement about how frequently they should be monitored. The inadequate frequency of vital sign recording is evident in the literature review (Hogan, 2006; Wheatley, 2006; McBride et al, 2005; Nurmi et al, 2005; Chellel et al, 2002) and may be due to a number of factors including workload pressures (Hogan, 2006).

‘Knowing the patient’ and ‘pattern recognition’

The basis of an EWS system is that nurses undertake vital sign observations and use the EWS physiological ranges to determine deterioration. However, the literature showed that nurses are unlikely to use these to detect deterioration (Odess et al, 2009).

While nurses may detect deteriorating patients through observations (Cutler, 2002), the main process for recognising deterioration is by intuitive knowing (Minick and Harvey, 2003; Cioffi, 2000a, 2000b). This “gut feeling” or sixth sense is built on a foundation of “knowing the patient” (Minick and Harvey, 2003; Kenward and Hodgetts, 2002; Cioffi, 2000b), and “pattern recognition” (Minick and Harvey, 2003; Kenward and Hodgetts, 2002; Cioffi, 2000a, 2000b).

“Knowing the patient” requires nurses to be able to build up a relationship with patients over time so that subtle changes in their signs and behaviour can be recognised. Experienced nurses develop “pattern recognition”, where repeated exposure to similar patients with specific conditions over time enables them to recognise subtle deviations from the norm.

Both “knowing the patient” and “pattern recognition” suggest the need for a stable, experienced nursing workforce, where nurses are able to build up relationships with patients and develop expertise over time. The pressures of staff shortages and increasing workloads may be a threat to these vital skills. If nurses rely on knowledge of their patients and pattern recognition to detect deterioration, it may follow that they will remain unconvinced about deterioration if it is evident only through routine observations (that is, if the patient does not appear to have deteriorated to them, they may fail to act if EWS system finds a problem). Nurses who are not concerned about patient deterioration from their own intuitive reasoning may need to be convinced about the significance of “abnormal” vital signs.

This might explain why the EWS systems can sometimes fail to guide nurses in recognising deterioration, where the “abnormal” vital signs are at odds with how patients appear to nurses. This is more likely to happen with inexperienced nurses who have not yet built up sufficient pattern recognition skills and are unable to recognise subtle changes in patients’ condition. Nevertheless, hospital policy should be adhered to regardless of nurse experience. If not then the rationale for not following procedure should be noted.

Family, friends and the patient as information source

One factor largely overlooked in the attempts to improve patient care and safety in this field is using patients and their family members as valuable sources of information. Patients and their relatives/friends will be the experts in “knowing the patient” and can often raise concerns about changes in condition before abnormal vital signs become apparent.

To this end, my hospital has recently launched a patient and relative initiated critical care outreach service, where patients and relatives are empowered to call the critical care outreach team directly if they have any concerns about the patient. Similar types of initiatives involving patients and relatives should be explored.

REFERRING PATIENTS FOR MORE EXPERT HELP

The second assumption underpinning the EWS system is that, once ward nurses detect deterioration, they readily refer on to more expert clinical help. However, the literature shows that reporting deterioration is a highly complex process that nurses do not take lightly (Odess et al, 2009). When referring patients to medical staff, nurses can feel nervous, anxious and uncertain about their clinical decision making (Cioffi, 2000b). Nurses may delay calling for help while they check with their colleagues because they feel uncertain about how to articulate deterioration (Andrews and Waterman, 2005; Minick and Harvey, 2003). They may even wait to see if the patient’s condition worsens to justify their referral (Cioffi, 2000b).
This review found that communication between nurses and doctors was a major issue. Nurses felt they had to use medical language to “convince” doctors about patients’ deterioration, but they had only been trained to use social language and provide subjective information (Andrews and Waterman, 2005); they were concerned about saying the wrong thing and maintaining their credibility with medical teams (Kenward and Hodgetts, 2002).

When doctors asked for additional, objective data about patients, nurses saw this as a stalling tactic and felt antagonised (Andrews and Waterman, 2005).

It would be worth exploring whether ward nurses would be more comfortable referring to other nurses, so justifying the use of nurse led expert teams rather than medical emergency teams.

CONCLUSION
The issue of detection and management of deteriorating ward patients has been at the forefront of safety initiatives for over a decade. One solution has been to implement rapid response systems, whereby patients’ vital signs are tracked; when predetermined ranges are breached, patients are referred for more expert clinical assessment.

While the problem is largely based on general wards, it was initially recognised by critical care areas through inappropriate and late referrals to intensive care units. As such, these systems were introduced through critical care specialties without a full understanding of the phenomenon of deteriorating patients on general wards or complexity of the culture, norms and values that influence nursing practice there.

Although EWS systems have helped to improve the detection and management of deterioration, their limitations need to be recognised and additional solutions need to be sought, based on in-depth ward-based research, rather than directed through the discipline of critical care.

● Nursing Times has teamed up with HSJ to present a new conference “Nursing the deteriorating patient: a practical guide to recognising and responding to the acutely unwell” on 17 March. For more details go to www.nursingdeterioration.com

REFERENCES
NPSA (2007b) Acute Care for the Acutely Ill Patient: Learning from Serious Incidents. London: NPSA.