

Increasing staff awareness of respiratory rate significance

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Respiratory rate is a significant predictor of critical illness and an important part of early-warning scoring. After an audit of patient records revealed a low incidence of respiratory-rate recording, a hospital-wide education programme was set up to raise awareness and improve critical care skills among ward staff. A repeat audit showed significant improvement in recording rates and identified new areas for training.

In recent years there has been an increase in the number of acutely ill patients being cared for on general wards, and evidence suggests ward patients are more likely to suffer critical illness than ever before (Whiteley et al, 2004).

With advances in medical technology and the increasing use of invasive procedures, patients are surviving longer and with more comorbidities (Whiteley et al, 2004). This, coupled with the increasing demands for beds, means ward nurses are often caring for patients who previously would have been cared for in a high-dependency unit (HDU) or intensive care unit (ICU). These issues have had an effect on ward teams, who often do not possess the necessary skills and expertise to recognise and then manage these acutely ill patients (McGloin et al, 1997; McQuillan et al, 1998; Goldhill, 2000).

The need for critical care outreach

An influential paper by McQuillan et al (1998) demonstrates that 'suboptimal care' often occurs on wards before patients are admitted to ICU. The authors' definition of suboptimal care includes a failure to appreciate that airway, breathing and circulation are the prerequisites of life.

McQuillan et al (1998) go on to suggest that reasons for this suboptimal care include poor organisation, lack of knowledge, failure to appreciate clinical urgency, lack of supervision and failure

to seek advice. These issues were highlighted by the Department of Health in *Critical to Success* (DoH, 1999) and *Comprehensive Critical Care* (DoH, 2000). These documents state that all critically ill patients, wherever they are located, should be provided with optimal care and that improvements in ward care are needed.

The critical care outreach service

In light of the DoH (1999; 2000) recommendations, many hospital trusts have established critical care outreach services. These services have a number of objectives:

- To avert admissions into ICU/HDU;
- To enable patients to be discharged from ICU/HDU to the wards by supporting nursing staff caring for these patients;
- To share critical care skills with nurses, so that they can care for patients who may be critically ill (DoH, 2000).

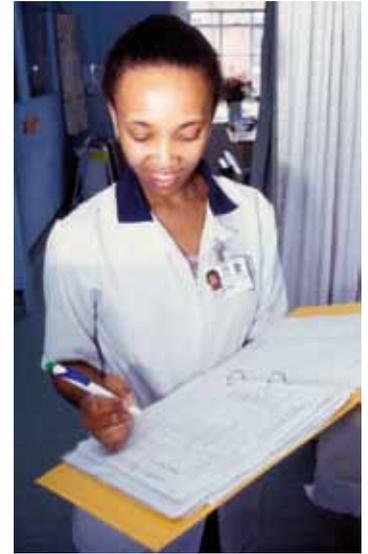
Cheltenham General Hospital employed a nurse consultant to implement critical care outreach in September 2001. After 16 months, the service was expanded to include an E-grade staff nurse on a nine-month rotational post from the ICU and HDU.

The first priority of the service was to provide education and support to the ward teams in the early identification and treatment of patients at risk of critical illness. This is reflected in McQuillan et al's (1998) findings, which demonstrate that the ward teams do not always appreciate clinical urgency when caring for these patients and are reluctant to seek advice.

The introduction of a modified early warning scoring system throughout the hospital supported and empowered staff in the early recognition of potential critical illness. There are many variations or modifications of early-warning scoring (EWS) systems and our hospital utilised a modified version of the one implemented in Burton-on-Trent (Stenhouse et al, 2000).

All systems have the common aim of early identification of and improved care for acutely ill patients (Coombs and Dillon, 2002). The EWS system relies on observation of the patient's vital signs (temperature, heart rate, blood pressure, respiratory rate and level of consciousness), then utilises a given score or specific calling criteria to trigger a more senior review (Carberry, 2002).

Triggering of the EWS system leads to earlier



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senior assessment and treatment, with the aim of preventing further deterioration into critical illness. Patient review occurs via the ward medical team with input from outreach and, ultimately, the anaesthetists if appropriate.

The outreach service piloted the use of EWS in the medical directorate, following education of all members of the multiprofessional team. A review of the system showed that patients were not being identified early enough and that wards were using the EWS as pre-arrest calling criteria. In considering how best to achieve compliance with the scoring system, and acknowledging the limited number of staff who were available to carry out a large study, we identified a common failure to record patient observations and, more frequently, the omission of the respiratory rate from observations. We felt that addressing the failure to record this fundamentally important observation was an achievable goal.

Significance of the respiratory rate

The normal respiratory rate (according to the EWS system used) is 9–14 breaths per minute. Evidence suggests an abnormal respiratory rate is a significant predictor of deterioration, cardiac arrest and/or need for admission to ICU (Hodgetts et al, 2002). Goldhill and McNarry (2004) demonstrate an association between easily recordable physiological abnormalities and mortality, while Rich (1999) suggests increased respiratory rate is the most significant predictor of critical illness.

There is much evidence to support the view that abnormal vital observations are evident in patients before acute deterioration and cardiac arrest (Goldhill and McNarry, 2004; Hodgetts et al, 2002; Buist et al, 2004). These observations include temperature, pulse, blood pressure, respirations, and oxygen saturation levels. However, staff in the trust were failing to record routinely the respiratory rate. This finding is supported by Chellel et al (2002), who demonstrated that ward nurses often fail to record this vital observation. They also discovered that basic nursing observations on the sickest ward patients were often incomplete.

Additionally, Hodgetts et al (2002) concluded that respiratory rate was missing from many patients' observation charts, even when 'SOB' (shortness of breath) was written in the documentation. While critical care outreach reviewed patients on general wards, it was noted that there was a failure to record respiratory rate and to appreciate its significance. It was decided to review the frequency of respiratory rate recording as a measurable criterion to improve the early identification of acute illness. Recording respiratory rate is a simple, basic, bedside observation, yet, for some reason, it is not seen as 'vital'.

FIG 1. RESULTS OF THE FIRST AUDIT

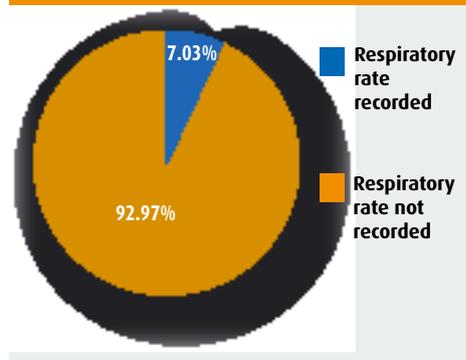
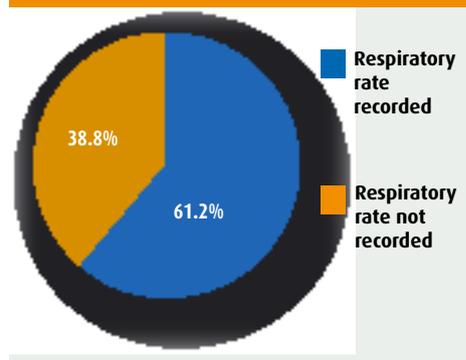


FIG 2. RESULTS OF THE SECOND AUDIT



Method

We decided to audit the recording of respiratory rate on patient observation charts throughout the hospital. A baseline hospital-wide audit was carried out in November 2002. This determined whether respiratory rate had been included as part of the most recent complete set of observations of a patient, that is, blood pressure, heart rate and temperature. The ICU, HDU and A&E were excluded because they are areas of critical care not affected by the outreach service, while paediatrics was excluded because normal vital signs in children differ from those in adults. Therefore, 17 wards with a total of 341 patients were audited during a single day. Ward staff were not given prior warning that the audit was to take place.

Results of the first audit

Of the 341 patients' observation charts audited, 24 (7 per cent) had a respiratory rate recorded with the most recent set of observations (Fig 1).

Following the results of the first audit, a hospital-wide education programme was implemented by the outreach service. This aimed to increase significantly the early identification and treatment of acutely ill patients by ward staff.

Education and training took various forms. The first priority was to continue training on the importance

of recording respiratory rate and its significance in the EWS. In collaboration with a number of other disciplines, we designed a new EWS and pain assessment observation chart to aid identification of at-risk patients. This made it easier to recognise the need for treatment by using bands of colour. If observations fell outside the bands, treatment was required. The chart was introduced initially in surgery in May 2003 and subsequently cascaded to all wards.

Education was targeted at all members of the multidisciplinary team including unqualified staff and nursing students. Along with the outreach education initiatives, other education programmes have been implemented throughout the hospital.

The trust has been delivering the ALERT (acute life-threatening recognition and treatment) course for over two years. This multidisciplinary course stresses the importance of early recognition and treatment of acutely unwell ward patients and is offered to all nurses, preregistered house officers and, occasionally, senior house officers. There is also the opportunity for nursing students and health care assistants to be observers and act as patients within the scenarios of the course, which has been well received within the trust. It has helped to improve the recording of observations accurately and empowered ward staff to identify when senior help must be sought.

A high-dependency skills day has been introduced at the trust in line with the recommendations in *Comprehensive Critical Care* (DoH, 2000), which has given ward nurses the clinical skills to care for the acutely ill patients. The day focuses on four areas of care: tracheostomy care, management of central lines and central venous pressure measurement, electrocardiogram (ECG) recognition, and oxygen therapy. Self-evaluation at the end of this one-day course has demonstrated improvements in nurses' confidence in carrying out HDU skills (Butler-Williams et al, 2005).

The outreach team has set up rolling teaching programmes for various wards, covering all aspects of assessment of acute illness. Examples include oxygen delivery, respiratory assessment, understanding sepsis and the importance of accurate fluid balance.

The outreach service also offers an outreach experience, where second-year student nurses in their acute placement have the opportunity to shadow the outreach team. This is also available for all staff who want to update their clinical assessment skills. It has proved extremely popular, with demand often exceeding availability. McArthur Rouse (2001) suggests that ward nurses need to be grounded in the principles of critical care, particularly assessment skills, and advocates spending some time working alongside outreach teams.

The team also trawls the wards and carries out spot checks on the EWS and pain-assessment observation charts. This helps to remind ward staff of the importance of measuring patients' respiratory rate.

Results of the re-audit

The audit was repeated 13 months later in December 2003 to assess any improvements and to ascertain the impact of the various teaching programmes. Of the 325 patients included in the second audit, 199 (61.2 per cent) (Fig 2) had a respiratory rate recorded in their most recent observations. This demonstrated an improvement of 54 per cent.

The results of the second audit revealed a substantial improvement in the recording of respiratory rate. The reasons for this are many, including the intensive teaching programmes and the introduction of the EWS system. The second audit has identified new areas for the outreach team to target for future teaching and training and there is evidence to support the impact of the teaching programmes carried out so far.

In future, the outreach team plans to run training days for health care assistants working within the trust, focusing on accurate recording of all observations and again emphasising the significance of patients' respiratory rate. It is thought that this will significantly increase compliance with the EWS scoring system. However, it must be acknowledged that there is always room for further improvements.

Conclusion

The outreach team currently only offers a weekday 8am-4pm service, so it is imperative that ward staff are able to recognise and treat acute illness themselves. Understanding the importance of recording the respiratory rate and its significance in identifying acutely unwell patients corresponds with all the evidence suggesting that early identification of acute illness improves patient outcome.

Carrying out this respiratory rate audit and highlighting its importance has enabled this improvement to be achieved. Resource constraints have shown it is not simply about utilising the skills and putting knowledge into practice. The crux is the sharing of those skills and knowledge.

Critical care beds are costly and scarce. The audit and training programmes organised by the critical care outreach team have enabled the trust to export critical care skills beyond the walls of intensive care. This means that ward staff are better equipped to respond quickly when a patient's condition deteriorates, improving patient outcomes and reducing the demand on the ICU. ■

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