Critical care outreach services and early warning scoring systems: a review of the literature

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Introduction

Several studies (Franklin & Mathew 1994, Rich 1999), have demonstrated that patients in hospital exhibit premonitory signs of cardiac arrest which may be observed by nursing and medical staff, but are frequently not acted upon. Similar findings have been observed in relation to deterioration in patients’ conditions prior to admission to Intensive Care Units (ICU) (Goldhill 1997, McQuillan et al. 1998, Goldhill et al. 1999a, McGloin et al. 1999), with the suggestion that...
Integrative literature reviews and meta-analyses

early recognition and treatment of these signs may prevent the necessity for some ICU admissions.

The term suboptimal care applies to lack of knowledge regarding the significance of findings relating to dysfunction of airway, breathing and circulation, causing them to be missed, misinterpreted or mismanaged (McQuillan et al. 1998). Several strategies for reducing the occurrence of suboptimal care have been proposed, which focus on the identification of patients at risk of critical illness and the provision of some form of critical care outreach service to provide expert advice in the management of these patients (Daffurn et al. 1994, Lee et al. 1995, Goldhill 1997, Morgan et al. 1997, Audit Commission 1999, Goldhill et al. 1999).

Reasons why the phenomenon of suboptimal care has arisen in recent years include the technological developments that have led to an increase in the number of procedures that are carried out on a day surgical or outpatient basis, and a shorter length of stay for patients undergoing inpatient procedures. Advancements in anaesthetic and critical care techniques have also enabled higher risk patients to undergo major surgical procedures that previously would have been inappropriate. This has meant that patients who are cared for in acute general wards are often older, undergoing major surgical procedures, or are acutely ill. The net effect of these occurrences is an increase in the acuity and dependency of patients being cared for in acute general wards (Coad & Haines 1999). Meanwhile, difficulties in recruiting qualified nurses has led to a dilution of the skill mix in many areas, the use of temporary staff, and reduction in the amount of paid study leave for nurses participating in postregistration education. Therefore, inexperienced staff may frequently be expected to care for more highly dependent patients, without appropriate training and support.

It is also worth noting that recent recognition of Intensive Care Medicine as a specialty has meant that many junior doctors have not had specific training in the care of patients with critical illness, and it is often the junior doctor to whom the ward nurse will turn when concerned about a patient’s condition. Personal communication with nurses in practice and in the classroom, has demonstrated that when they are concerned about a patient they often have difficulty in convincing a doctor to take action. Reasons for this may include their own inadequacy in articulating their findings and concerns, and the junior doctor’s inexperience or reluctance to seek help from a senior colleague.

Clearly there is work to be carried out educating nursing staff in the recognition of early warning signs of critical illness, as well as in the care of highly dependent patients in the ward environment. But as this is still a relatively new phenomenon, there is little evidence regarding the best way to support ward staff. As discussed, several studies have already been undertaken in this area, and recommendations have been made that will influence care provision nationally (Audit Commission 1999, Department of Health (DOH) 2000). With these issues in mind a literature search was undertaken of the BIOMED and NESLI databases using the key words ‘outreach’, ‘early warning signs/systems’ and ‘suboptimal care’. In view of the recent nature of this topic, the literature review was limited to the past 10 years. Thirty-three sources were identified and accessible, of which nine primary research articles were thought to be most relevant and, therefore, chosen to review.

Literature review

The literature was reviewed in relation to the concepts of suboptimal care, critical care outreach teams and early warning systems for detecting critical illness. Franklin and Mathew (1994) carried out a study to determine the frequency of premonitory signs and symptoms before cardiac arrest in patients on general medical wards. They also sought to discover if there were any characteristic patterns in nurse and physician responses to these signs and symptoms, and whether cardiac arrests were more common in patients who had been discharged from the ICU. The basis for their study was evidence from previous research which highlighted the poor survival rate of patients who suffer in-hospital cardiac arrest on general wards. They stated that:

The trends have been so dramatic that a number of observers have questioned whether resuscitation, based on the low number of survivors and the high costs involved, might be considered futile therapy in specific groups of patients. (Franklin & Mathew 1994, p. 244)

Franklin and Mathew (1994) studied the medical records of 150 patients who suffered a cardiac arrest over a 20 month period. They found that former ICU patients were more than twice as likely to suffer a cardiac arrest as other patients, and that the majority of cardiac arrests were preceded by observable deterioration in the patient’s condition. Several patterns emerged regarding the nurses’ and medical staff’s responses to the precardiac arrest signs and symptoms. First, the nurse who initially examined the patient often failed to notify the physician of clinical deterioration; second, the first doctor made aware of the patient’s condition tended to ignore arterial blood gas analysis in evaluating symptoms of pulmonary insufficiency or central nervous system compromise; and finally, the physician responsible for transferring the patient to the ICU before cardiac arrest often underestimated the need to stabilize the patient before transfer.

It could be argued that because Franklin and Mathew’s study was based on a review of the medical records, some interventions or reporting of symptoms may have taken place that were not recorded. This is a limitation of retrospective chart reviews. However, it is not possible to speculate about what was or was not recorded, and the suggestion emphasizes the need to ensure that documentation is complete. Ayres (1994) discusses Franklin and Mathew’s study and argues that there are implications for medical education and supervision of junior staff. He suggests that ‘the segregation of highly trained physicians and nurses in the ICU may have a negative effect on patients in other parts of the hospital...’ (p. 191).

In a frequently cited study, McQuillan et al. (1998) carried out a confidential inquiry into the quality of care of 100 patients prior to admission to ICU. Their method involved the use of detailed questionnaires completed during structured interviews, which focused on the recognition, investigation, monitoring and management of abnormalities of airway, breathing, circulation and oxygen therapy. Data from the questionnaires were sent to two external intensivist assessors who were asked to consider the quality of medical care, appropriateness and timeliness of ICU admission using a linear analogue scale to score the adequacy of patient management. It is worth noting that the external assessors disagreed on the quality of care in 26 patients, and that their opinions on whether admission to ICU was avoidable, and whether suboptimal care contributed to morbidity and mortality, differed widely. For example, they agreed that 39% of the patients were admitted late to intensive care, but disagreed on a further 25%. It may have been useful to have had more external assessors, although this could have complicated data interpretation if the lack of consensus regarding what constitutes suboptimal care is widespread.

Reasons why it is hard to agree on what comprises suboptimal care may include the fact that the concept is ill defined and based on subjective opinion, which is influenced by individual knowledge and experience.

McQuillan et al.’s (1998) study has also been criticized because the external assessors were aware of the outcomes of the patients, and this may have biased their opinions (Gorard 1999, Walshe 1999). However, acknowledging the limitations of their study, McQuillan et al. (1998) argue that the assessors agreed that 54% of patients received suboptimal care prior to admission to ICU and that this suboptimal care had a substantial impact on the individual morbidity, mortality, and requirement for intensive care resources. They make some suggestions for improving quality of care before admission to ICU, most of which focus on medical staff roles and training. There is little recognition of the potential contribution that nurses can make to the anticipation of critical illness. McQuillan et al. (1998) recommend the introduction of a medical emergency team (MET) in order to pre-empt life threatening dysfunction of airway, breathing and circulation, rather than relying on the cardiac arrest team. They also suggest using minimum criteria for calling such a team adapted from Lee et al.’s (1995) study (Table 1).

In a similar study, McGloin et al. (1999) examined the care received by 86 patients prior to admission to ICU on 98 occasions. Although they blinded their assessors to patient outcome, they found that suboptimal care (which was clearly defined) was identified in 31 patients. Furthermore, 20 of these patients died, a mortality rate that was significantly higher than in a well-managed group of patients.

Goldhill et al. (1999a) studied the records of 76 patients, who experienced 79 admissions to ICU from general wards, for the 24-hour period before admission. The aim was to describe the reasons for admission of hospital inpatients to the ICU, and to identify physiological values and interventions associated with patients at risk. Their task was clearly complicated because despite the severity of illness, routine observations were seldom found in notes, and data was often recorded improperly or imprecisely, again highlighting the issue of poor documentation. However, they observed that there was a significant worsening of respiratory rate during the 24-hour period before admission, which did not occur with heart rate. It is worth noting that 23 of the ICU admissions in this study were for chest infection or pulmonary aspiration, which may have influenced this finding.

Goldhill et al. (1999a) found that the majority of patients in the study received oxygen therapy, oxygen saturation treatment, which focused on the recognition, investigation, monitoring and management of abnormalities of airway, breathing, circulation and oxygen therapy. Data from the questionnaires were sent to two external intensivist assessors who were asked to consider the quality of medical care, appropriateness and timeliness of ICU admission using a linear analogue scale to score the adequacy of patient management. It is worth noting that the external assessors disagreed on the quality of care in 26 patients, and that their opinions on whether admission to ICU was avoidable, and whether suboptimal care contributed to morbidity and mortality, differed widely. For example, they agreed that 39% of the patients were admitted late to intensive care, but disagreed on a further 25%. It may have been useful to have had more external assessors, although this could have complicated data interpretation if the lack of consensus regarding what constitutes suboptimal care is widespread. Reasons why it is hard to agree on what comprises suboptimal care may include the fact that the concept is ill defined and based on subjective opinion, which is influenced by individual knowledge and experience.

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<table>
<thead>
<tr>
<th>Acute changes in</th>
<th>Vital signs</th>
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<tbody>
<tr>
<td>Airway Threatened</td>
<td>Respiratory rate ≤5</td>
</tr>
<tr>
<td>Breathing Respiratory rate ≥36</td>
<td>Systolic BP (mmHg) &lt;10</td>
</tr>
<tr>
<td>Circulation Pulse rate/minute ≤40 or ≥120</td>
<td>Fall in GCS of &gt;2 points</td>
</tr>
<tr>
<td>Neurology Repeated or prolonged seizures</td>
<td>Fall in GCS of &gt;2 points</td>
</tr>
<tr>
<td>Other Any patient who does not fit the criteria above who you are seriously worried about</td>
<td></td>
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</table>

monitoring and arterial blood gas analysis that were not routinely carried out on the wards. Therefore, they propose that the critically ill patients had been identified and were receiving additional monitoring and treatment. However, despite this, many patients deteriorated to the point where cardio-pulmonary resuscitation became necessary. Goldhill et al. (1999a) suggest that reasons for delayed admission to ICU from wards may include the perceived difficulty in obtaining an ICU bed, unsatisfactory hand-over of patients, poor continuity of care and inexperienced, poorly supervised trainees. They argue that if published guidelines for the admission of patients to ICU (DOH 1996) had been followed, many of the ward patients would have been admitted earlier. Reviewing and contrasting previous studies, they conclude:

Our data suggest that respiratory rate, heart rate and the adequacy of oxygenation are the most important physiological indicators of a critically ill ward patient. The level of consciousness and presence of renal failure may also be important indicators. (Goldhill et al. 1999a, p. 534)

With regard to this information, Goldhill et al. (1999a) state that critically ill patients need to be identified and managed expertly, and recommend the use of a medical emergency team as described by Lee et al. (1995).

Recognizing that previous studies had identified premonitory signs of cardio-pulmonary arrest in an attempt to improve outcome and to prevent cardio-pulmonary arrests, Lee et al. (1995) introduced the concept of a MET in Australia, to replace the existing cardiac arrest team. The MET consisted of medical and nursing staff trained in the principles of resuscitation, who could be alerted by nurses or doctors using predefined criteria. Lee et al. (1995) found that despite the MET system, mortality from cardiopulmonary arrest remained high. They argue that this may be because potentially salvageable cases had been prevented. The calling criteria (Table 1) were subsequently modified (Hourihan et al. 1995).

This suggestion is supported by Daffurn et al. (1994), who describe how the nursing staff in the Australian hospital responded to the MET system. They argue that the circumstances under which nurses summon medical assistance are not well documented, however, they tend to use more than one sign to make inferences about a patient’s condition. To facilitate their study, Daffurn et al. (1994) distributed a questionnaire to all nursing staff on duty at the afternoon shift changeover on the chosen study date. The questionnaires were completed and returned within half an hour. The aim of the questionnaire was to gain information about nurses’ experiences with the MET. The questionnaires also included scenarios to test their knowledge and responses to particular situations. The results indicated that the predominance of calls were made for cardiac arrest, respiratory arrest and convulsions. Ward nurses utilized the MET more than those working in critical care areas and it is suggested that this was because of better access to medical staff in the critical care areas. The authors state that this highlights the need to develop systems that are responsive to the needs of general wards. It is interesting to note that the responses to the scenarios were varied, despite the standardized calling criteria. Change in observations prompted calling the MET in only 2.8% of cases and obvious patient distress appeared to be the trigger compelling most nurses to call the MET. They conclude that despite favourable attitudes towards the MET system, nurses did not always follow the calling criteria.

This phenomenon is explored further by Cioffi (2000) who followed up Daffurn et al.’s study, and undertook a descriptive study to investigate the experiences of nurses who had been involved in calling the MET. Cioffi identified that nurses often recognized patients in need of MET calls from ‘feelings they had about patients – a gut feeling, a sixth sense’ (Cioffi 2000, p. 113) and that these were often linked to past experiences. Cioffi concludes that although the criteria for calling the MET standardizes the indicators for calling objectively with physiological variables, nurses’ subjective recognition of patient deterioration also needs to be valued.

Goldhill (1997) refers to the 1992–1993 and 1993–1994 United Kingdom (UK) national confidential inquiries into peri-operative deaths and notes that approximately two-thirds of patients died three or more days after surgery, and that most deaths took place on wards. He identifies some of the risks associated with general anaesthesia and surgery, and outlines the monitoring and facilities that ought to be used for caring for postoperative patients. However, recognizing that these facilities are not routinely available on surgical wards, he suggests the use of a postoperative care team, similar to the concept of the acute pain team, to provide expertise and equipment to assist in the care of postoperative patients. In response to his article, Notcutt (1997) argues that this may cause the ward nursing and medical staff to become de-skilled and states that:

The most important factor in the improvement of postoperative care is to define and then enhance the role of ward surgical nurses. Empowering them to take therapeutic measures...will avoid so much of the delay and indecision on the part of inexperienced junior doctors that contributes to morbidity. (Notcutt 1997, p. 1347)

In a later article, Goldhill et al. (1999b), describe how they implemented a Patient at Risk Team (PART), similar to the
MET discussed by Lee et al. (1995). Acknowledging that before cardiac or respiratory arrest and/or admission to ICU, patients often demonstrate physiological abnormalities, which are known to medical and nursing staff, Goldhill et al. (1999b) implemented the PART. The aim of the team was to improve care by providing support to those responsible for patients on the wards, thereby facilitating early ICU admission and preventing unnecessary admissions. The aims of this particular study, however, involved an assessment of ‘whether the physiological criteria used to call the PART were appropriate and useful in determining the necessity for admission to ICU’ (Goldhill et al. 1999b, p. 853).

A prospective study was carried out over a period of 6 months. The criteria for calling the PART (Table 2) were established by a committee of surgical, medical, ICU and nursing staff based on a previous audit of patients admitted to ICU from the wards (Goldhill et al. 1999a). The criteria consisted of a combination of physiological abnormalities, which would ‘prompt the ward nurses to call the doctor’ (Goldhill et al. 1999b, p. 854). This protocol was then circulated to all wards and staff were informed about the PART. Information on each patient seen by the PART was recorded and the data examined to see whether the predefined combination of physiological values for calling the PART was of any worth.

During the 6-month study period the PART was called 69 times to see 63 patients. At assessment, many of the patients were already being monitored and treated more intensively than they would be normally on the wards. Of patients admitted to ICU from the wards, 28 were assessed by the PART prior to admission and 69 were not. Goldhill et al. (1999b) argue that this may be because some nurses and doctors were unaware of the existence of the PART, or that the doctor caring for the patient may have decided not to call the team. However, one could also argue that the criteria for calling the PART were too prescriptive and that the need for a patient to fulfil three criteria, in order to trigger referral, may have prevented the nursing staff from calling the team. Goldhill et al. (1999b) acknowledge that:

The physiological criteria used to notify the PART are likely, by themselves, to be unsatisfactory for identifying critically ill patients on the wards. Some patients admitted to the ICU fulfilled none, and many fulfilled fewer than three, of the six main criteria. Many of these patients must have been recognized as being seriously ill with a high percentage being monitored and receiving oxygen on the ward before ICU admission. (Goldhill et al. 1999b, p. 859)

Several other authors have attempted to devise early warning scoring systems for detecting patients at risk of developing critical illness (Table 3) (Morgan et al. 1997, Stenhouse et al. 1999, Welch 2000), which rely on the observation of various physiological parameters. However, these have yet to demonstrate sensitivity, specificity and usefulness (Goldhill 2000).

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**Table 2** The patient-at-risk team (PART) calling criteria (Goldhill et al. 1999b)

<table>
<thead>
<tr>
<th>A: The senior ward nurse should contact the responsible doctor and inform them of a patient with:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any three or more of the following:</td>
</tr>
<tr>
<td>• Respiratory rate ≥ 25 breaths/min (or &lt; 10)</td>
</tr>
<tr>
<td>• Arterial systolic pressure &lt; 90 mmHg</td>
</tr>
<tr>
<td>• Heart rate ≥ 110 beats/min (or &lt; 55)</td>
</tr>
<tr>
<td>• Not FULLY alert and orientated</td>
</tr>
<tr>
<td>• Oxygen saturation &lt; 90%</td>
</tr>
<tr>
<td>• Urine output &lt; 100 mL over last 4 hours</td>
</tr>
<tr>
<td>OR a patient not FULLY alert and orientated AND respiratory rate ≥ 35 breaths/min OR heart rate ≥ 140 beats/minutes</td>
</tr>
</tbody>
</table>

Unless immediate management improves the patient, the doctor should consider calling the team.

Exceptionally (in emergency when responsible doctor not immediately available) the senior ward nurse may contact the team directly.

B: A doctor of registrar grade or above may call the team for any seriously ill patient causing acute concern. This will normally be carried out after discussion with the patient’s consultant.

The consultant responsible for the patient must be informed as soon as practical that the team has been called.

Discussion

Having examined the literature relating to the need for a system of identifying and treating patients at risk of critical illness, it now remains to discuss this in relation to the UK government’s recent initiatives. The Audit Commission (1999) reported that the efficiency and effectiveness of critical care services varied widely between hospitals. One of their recommendations was to improve services for patients on wards who are at risk of deterioration by reviewing recognition skills of early warning signs; agreeing upon guidelines to help ward staff identify when to call for specialist advice; and developing critical care outreach services to support ward staff in managing patients at risk.

Recent government initiatives

Also in 1999, the Department of Health (England) established a review of adult critical care services, appointing an expert group to develop a framework for the future organization and delivery of critical care services (DOH 2000). The document (Comprehensive Critical Care) outlines a modernization programme to develop consistent and comprehensive critical care services and highlights action in four areas. Of particular relevance to this paper are the recommendations pertaining to extending critical care services beyond the boundaries of intensive care and high dependency units (HDUs), and developing a workforce of appropriately trained staff to care for critically ill patients. These recommendations are discussed further below.

Following the publication of Comprehensive Critical Care (DOH 2000), the DOH allocated £145 million for the year 2000/2001 for adult critical care services, stating that attention should be focused on the establishment of outreach teams, additional critical care beds and postoperative intensive recovery facilities (NHS Executive 2000). Thus, NHS Trusts are setting up, or developing existing critical care outreach services nationally. The aims of the outreach teams are to avert admissions to ICU by identifying patients who are deteriorating, or ensuring that admission to a critical care bed is timely; to enable discharges by supporting the continuing recovery of patients discharged from ICU; and to share critical care skills with ward staff by enhancing training opportunities and skills practice (DOH 2000).

Smith (2000) discusses how the model for outreach teams in the UK has yet to be defined, arguing that there is little evidence on which to base the structure. Although some hospitals will develop a team similar to the MET or PART, there are likely to be local variations with some Trusts introducing nurse-led systems. Smith (2000) argues that whilst the development of such teams appears ‘intuitively beneficial… to date, there is little science to support the widespread promulgation encouraged in the DOH’s plans’ (p. 198). He identifies some problems associated with nurse-led teams, including limitations in the number and nature of therapeutic measures that nurses may prescribe; difficulties in them being accepted by the ward medical staff; and problems in finding appropriately skilled nurses to take on this role, particularly in relation to the expansion in the numbers of ICU and HDU beds, which will need to be staffed.

Issues concerning outreach teams

Several authors have identified problems relating to the use of outreach teams, particularly in relation to ward staff. Mercer et al. (1999) respond to McQuillan et al.’s (1998) paper with an update on their own experience of using the MET in Australia, stating that since their unit pioneered the concept in 1990 they have managed to prevent the need for many ICU and HDU admissions, but that adverse effects of the MET are apparent:

Table 3 The early warning scoring system for detecting developing critical illness (Morgan et al. 1997)

<table>
<thead>
<tr>
<th>Score</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR</td>
<td>&lt;70&lt;40</td>
<td>41–50</td>
<td>51–100</td>
<td>101–110</td>
<td>111–130</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>SBP</td>
<td>&lt;70</td>
<td>71–80</td>
<td>81–100</td>
<td>101–199</td>
<td>&gt;200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RR</td>
<td>&lt;8</td>
<td>8–14</td>
<td>15–20</td>
<td>21–29</td>
<td>&gt;30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEMP</td>
<td>&lt;35</td>
<td>35 1–36 5</td>
<td>36 6–37 4</td>
<td>&gt;37 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CNS</td>
<td>A</td>
<td>V</td>
<td>P</td>
<td>U</td>
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A = alert; P = response to pain; V = response to verbal stimulus; U = unconscious; HR = heart rate; SBP = systolic blood pressure; RR = respiratory rate; TEMP = temperature; CNS = central nervous system.

Despilifying of ward nursing staff does occur, and this risks an increase in the number of calls to medical emergency teams and greater need for high dependency unit facilities as staff become uncomfortable and unwilling to manage sick patients on the ward. (Mercer et al. 1999, p. 54)

Garrard and Young (1998) argue that the MET or outreach team must provide an educational role in order to prevent de-skilling of ward-based junior medical and nursing staff. They suggest that ICUs should adopt a hospital-wide educational role, stating that they can no longer function as isolated islands of expertise.

Responding to Goldhill’s (1997) suggestion of a Post-Operative Care Team, Gibson (1997) argues that not only may ward nurses become de-skilled, but that patient care may become fragmented by introducing another specialist team in addition to the patient’s regular nursing and medical staff. She suggests that the introduction of such a team could disenfanchise ward nurses from critical care issues. Acknowledging the role that acute general ward nurses have to play in the prevention and initial management of critical care situations, Gibson (1997) states that it is ward nurses who are in the best position to provide early recognition and intervention if complications arise. To this end, they need grounding in the principles of critical care, particularly assessment and monitoring. Thus, it would be beneficial for them to spend some time working alongside the outreach team to enhance their skills.

The idea that ward staff should be enabled to assess and care for seriously ill patients in the ward environment is supported by Welch (2000), who states that:

...the most rapid response can only be achieved if nurses at the bedside are empowered to undertake key clinical interventions that address identified needs. (Welch 2000, p. 4)

Discussing the MET and PART calling criteria, Welch argues that an ideal protocol would identify all patients in danger of critical illness, without any false alarms, but that a completely foolproof system may never exist.

Similarly, Smith (2000) argues that all of the systems of identifying patients at risk have yet to be evaluated to assess the sensitivity, specificity or usefulness of the chosen physiological parameters. Therefore, their ability to identify patients who can be helped has yet to be proven. Of further concern, is the possibility that the use of calling criteria or early warning scoring systems will reduce the need for, and the ability of, ward staff to assess and evaluate their patients (Smith 2000). This concern is echoed by Place and Graham (2000) who present a dynamic and critical approach to assessment that encourages nurses to utilize knowledge to make sense of their findings, rather than relying on the observation of specific physiological parameters.

Another area of concern in relation to the implementation of critical care outreach services, is the possibility that they will encourage the use of monitoring techniques and therapies that have traditionally been the remit of ICUs and HDUs. This could increase the pressure on ward staff, especially if training is inadequate (Smith 2000). Smith argues that if outreach services are not provided on a 24-hour basis, ward staff may feel unsupported. He asks the question ‘who will look after the patient on the general ward once the outreach team has left?’ and observes that although the teams are supposed to have an educational role, their remit in providing clinical support to the whole hospital will limit the time available to support and educate individual staff.

Educational implications

Coad and Haines (1999) describe how they carried out an audit of the educational needs of ward staff, stating that whilst there is a great deal of literature outlining difficulties encountered by patients transferred from ICU to the ward environment, little is known about the needs of ward staff caring for them. Examples of identified needs included information relating to haemodynamic monitoring and fluid management, and the care of patients with a tracheostomy or receiving specialized respiratory support such as high flow oxygen therapy. Having completed the audit, Coad and Haines (1999) used the information to design a range of teaching sessions for ward staff, which aimed to present relevant information that could immediately be put into practice. Such an approach to supporting and educating ward staff is essential if the aims of the DOH (2000) are to be achieved. Indeed, recognizing the need for a pool of staff with high levels of competence, DOH (2000) recommends:

A modular continuous framework of courses should be developed...This should include modules on high dependency care for all ward staff working in acute hospitals... (DOH 2000, p. 20)

The implications of the issues so far discussed for providers of nurse education are vast. Already many NHS Trusts are setting up short courses in High Dependency Nursing for ward staff, either through in-house programmes or in collaboration with a local education provider. It is imperative that in the delivery of such courses, issues relating to the early recognition of developing critical illness are addressed. These should include assessment and monitoring skills, an in-depth knowledge of normal and abnormal physiology, application to the recognition and care of seriously ill patients, and
professional decision-making. Additionally, such topics need to be addressed in the preregistration nursing curriculum.

Conclusion
Throughout this paper the issues relating to suboptimal care, critical care outreach services, and the use of early warning systems for the detection of critical illness have been discussed with particular reference to ward nursing staff. Unfortunately, it has not been possible to address other important and relevant issues such as the need for high dependency beds, the role of outreach teams in identifying patients who are not appropriate for ICU admission, and the subsequent application of Do Not Resuscitate orders. These issues will also have implications for the way in which critical care outreach services are set up and audited.

There is no doubt that these services will be developed nationally in England in the near future, indeed, some NHS Trusts are already implementing them. It is important, however, that the effectiveness of the outreach teams is audited, and that further research is undertaken in order to evaluate what is, after all, a costly service.

The ward staff need to be educated to assess and monitor their patients to such a standard that they are able to identify those who are deteriorating or are at risk, early enough to call the appropriate personnel. Whilst dependency scoring systems are important for audit purposes and for the identification of the level of care required by patients, the use of early warning scoring system or specific criteria for calling a doctor or the outreach team requires further debate. As discussed, much of the literature has demonstrated that they are ineffective, or that for some reason nurses do not use them. It could be argued that the presentation of patients at risk of developing critical illness is too complex to be effectively assessed by such a reductionist approach. The emphasis should be on encouraging the ward staff to carry out a thorough assessment of the whole patient, utilize knowledge to make sense of their findings, and articulate those findings to the appropriate personnel. After all, it should not be necessary for registered nurses to require such a ‘prompt’ to call a doctor. This area would benefit from further study to examine how nurses make decisions about calling a doctor, and on what knowledge or experience they base those decisions.

Finally, it is worth noting that in an ideal world critical care outreach teams would not be necessary, because the wards would be appropriately staffed with nurses and doctors trained and competent in identifying those at risk, seeking help when necessary and implementing care for highly dependent patients. Currently, this is not the case, but it is the responsibility of clinical and educational staff from the various specialities and disciplines, to make it their aim.

References
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