

# Improving outcomes for severely ill medical patients

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The interface between acute general medicine and critical care services has been the focus of a Royal College of Physicians Working Party, which will issue its report later in 2002<sup>1</sup>. A number of factors led the College to commission the work, principal amongst which was the publication of data indicating that the care of severely ill medical inpatients in the UK is frequently suboptimal<sup>2,3</sup>. Such evidence suggests that poor recognition of the severity of illness by junior clinical staff, lack of senior medical input, and the slow or inappropriate application of therapeutic interventions are widespread. Thus, one investigation of the quality of medical management prior to intensive care unit (ICU) admission found it to be unsatisfactory in 54% of cases<sup>2</sup>. The mortality in this group was 48% compared to 25% in those managed appropriately. Even more disturbingly, studies of events leading to 'unexpected' in-hospital cardiac arrest indicate that many patients have clearly recorded evidence of marked physiological deterioration prior to the event, without appropriate action being taken in many cases<sup>4,5</sup>.

In forming the Working Party, the College also recognised the high profile that critical care services have assumed within the UK Department of Health (DH). Following a number of index cases involving either long inter-hospital transfers or repeatedly cancelled major elective surgery due to lack of ICU beds, the DH published an influential report, *Comprehensive Critical Care*, which provided a blueprint for the future development of critical care services in England<sup>6</sup>. The report discussed two major problems in critical care services – lack of sufficient capacity and organisational issues. Bed provision in ICUs in the UK has historically been one of the lowest in the industrialised world<sup>7</sup>. Only 2.6% of hospital beds were thus designated before 2001, compared with European and North American averages of 3.3% and 5–7% respectively. Partly as a result of such evidence, ICU capacity in the winter of 2000 underwent a marked expansion in England with an increase of approximately 22% in total bed numbers catering for patients with what is now termed Level 2 and Level 3 dependency (Table 1)<sup>8</sup>. Level 2 bed numbers increased by approximately 50% and Level 3 by 8%. Other recommendations of the report concerned changes in the way such services should be delivered, encapsulating a philosophy of 'critical care without walls'. The significance of this philosophy lies in the

recognition that the needs of the severely ill must be met, no matter where such patients are physically located within the hospital. Critical care should thereby become mobile, offering advice, assistance and education outside the traditional confines of the ICU. These changes have clear implications for the future management of severely ill medical patients.

Other important changes involve the recognition of critical care as a separate specialty, albeit with strong links to anaesthesia, medicine and surgery. The development of dedicated training schemes and the availability of a combined Certificate of Completion of Specialist Training (intensive care medicine combined, most frequently, with anaesthetics or general internal medicine plus specialty) is likely to raise the profile of critical care in the UK to the level seen already in other countries. In this context, expanded, better-funded critical care services are likely to be used in the UK to fill perceived or real gaps in the provision of care for the severely ill. Physician involvement in this process therefore requires reappraisal.

How can the current management of the severely ill medical inpatient be improved? The College Report identified three key areas where changes were recommended: in the organisation of services; in the physical facilities available to treat patients; and in the training of junior staff in the care of the severely ill.

## The organisation of services

Physicians have always valued their diagnostic skills, as typified by the entertaining clinical case presentations in the *New England Journal of Medicine*. However, this cerebral approach to problem solving may be inappropriate when the clinician is confronted by the severely ill. In these circumstances, a successful outcome is less reliant on the precision of diagnosis and more upon rapidity of decision making and practical competency in resuscitation. This in turn is likely to require the early involvement of senior (consultant) medical staff. The current organisation of acute medical services does not always facilitate this approach. In many UK hospitals, consultant physicians supervise take days from a distance, while simultaneously carrying out other duties. This encourages a perception (often incorrect) that senior medical staff are only available for advice and assistance at certain set times (the ward

round). Moreover, the presence of highly experienced junior medical and anaesthetic staff has in the past reduced the exposure of consultant physicians to the severely ill and led to a loss of appropriate skills. In a recent survey, less than 50% of consultant physicians had obtained central venous access in the previous two years<sup>9</sup>. Such a hands-off or supervisory role in acute medicine is unlikely to be sustainable for senior staff. The European Working Time Directives do not distinguish between 'on call' and direct working time. The adoption of some form of complete shift system for all medical staff, including consultants, seems likely. This change, coupled with the availability of fewer and supernumerary trainees, will give physicians a much more direct and participatory role in the medical take.

The Working Party's Report therefore recommends that consultant physicians move in the first instance to a dedicated system of on-call, identifying their sole responsibility during their period of duty as being to new acute referrals and to the evaluation and management of acutely ill inpatients. Such a change in work practice will necessitate considerable consultant expansion to ensure that outpatient work, consultations and administrative tasks continue to be done. Suitable training schemes also need to be put in place to allow existing consultants to update and acquire new skills and competencies in acute care.

The management of deteriorating medical inpatients is also a significant problem, particularly at night and at weekends. Responsibilities for these patients usually falls to the acute take team whose primary focus is on a rising tide of new admissions. The Working Party endorses two approaches recommended in *Comprehensive Critical Care: Early Warning Scoring* (EWS) systems and outreach services. Early Warning Scoring systems are based upon the premise that there is a common physiological pathway of deterioration in the severely ill, which can be detected by simple ward-based observations<sup>10</sup>. A weighted score is attached to a combination of blood pressure, pulse, respiratory rate, urine output and simplified level of consciousness. Once a given threshold is exceeded, *nursing and other para-medical staff* are empowered to contact designated medical teams for assistance. Escalation policies are put in place whereby a failure to improve (or to receive prompt help) results in the immediate contact of more senior members (including consultant staff). These EWS systems are still relatively unproven, but evidence is emerging of their efficiency in the medical setting<sup>11</sup>. However, scoring systems can only be successful if they are linked to teams which can take effective action. *Comprehensive Critical Care* recommended the development of outreach services in all acute Trusts. The purpose of these services is to provide education and support for ward staff in the management of the severely ill. It was also envisaged that they would have a function in the prevention of ICU admissions by early identification and timely resuscitation of the severely ill. Physicians should not assume that outreach teams will automatically solve the problem of the deteriorating inpatient. The composition of outreach teams is currently variable with both nurse- and medically-led models in place. Few services are available on a 24-hour basis at present. The Report encourages physicians to explore ways in which outreach could be developed into a

**Table 1. Description of the new critical care dependency levels**

<b>Level 0</b>	Patients whose needs can be met through normal ward care in an acute hospital
<b>Level 1</b>	Patients at risk of their condition deteriorating, or those recently relocated from higher levels of care, whose needs can be met on an acute ward with additional advice and support from the critical care team
<b>Level 2</b>	Patients requiring more detailed observations or intervention including support for a single failing organ system or post-operative care and those 'stepping down' from higher levels of care
<b>Level 3</b>	Patients requiring advanced respiratory support alone or basic respiratory support together with support of at least two organ systems. This level includes all complex patients requiring support for multi-organ failure

service, independent of the on-take team, which could help to fill the existing out-of-hours gap but which will require active participation.

### Physical facilities

Physicians caring for the acutely ill need ready access to facilities designed to support patients with Level 1–3 dependency (Table 1). Recent expansion in the number of such beds in England has undoubtedly helped, but access for medical patients is still frequently restricted, with Level 2 beds targeted predominantly at post-operative care. Significant numbers of medical patients are also likely to benefit from these facilities<sup>12</sup>. Specifically, there is good evidence that patients receiving non-invasive ventilation (NIV) with an initial pH <7.30 have a better outcome if treated in a critical care rather than general ward setting<sup>13</sup>. The Working Party estimates that one Level 2 bed is needed for every 10–15 medical admissions, suggesting that physicians will need to campaign actively at local and national levels to ensure their patients have adequate access.

Physicians also have expertise in the longer-term management of patients. Many survivors of lengthy ICU admission need prolonged periods of intermediate and ward care before discharge. A number have respiratory problems and some require long-term respiratory support. The Working Party recommends that each Trust has a nominated physician co-ordinating the care of severely ill medical inpatients. He or she would be a member of the Trust Critical Care Delivery Group and be responsible for the training and education of physicians in acute care.

### Training

Both general and Higher Specialist Training in Medicine have traditionally focused on organ-based specialties. The assessment and treatment of the severely ill needs a different approach based on the recognition and reversal of impending multi-system failure. A number of specialist courses have adopted this

approach, but as yet are not routinely incorporated into either the undergraduate or postgraduate training syllabus. The Working Party recognised that competency-based training is fundamental to achieving the changes and improvements that it recommends, suggesting that training in acute care must begin in medical school, continue during the SHO and SpR years and allow for refresher courses at consultant level. The development and universal adoption of an acute care training programme is suggested, with all SHOs receiving some form of certification on completion of training. Attachments to critical care services, A&E departments and departments of anaesthesia are recommended. These secondments will be beneficial both in terms of skill acquisition and improving the teamwork needed to manage the severely ill successfully. The syllabus and assessment for general internal medicine training will clearly need to be modified to reflect this emphasis.

Finally, more physicians need to acquire the formal critical care training and qualifications supervised by the Intercollegiate Board for Training in Intensive Care Medicine. A mandatory six-month period of training in anaesthesia before entry remains a hurdle for physicians. Anaesthetic and medical cross-attachments are mutually beneficial for anaesthetists and physicians. Mechanisms (and funding!) need to be found to put such rotational schemes in place.

The care of the acutely ill medical patient should no longer be viewed as someone else's responsibility. The outcome for this challenging group of patients can be improved, but will require fundamental changes in the way physicians approach acute medicine and the severely ill.

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