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LEADING ARTICLE

The high dependency unit: where to now?

Over the second half of this century, intensive care has developed as a specialty throughout the world. This is partly because of the need for ventilation of patients as a result of the polio epidemic in the 1950s, but it became clear that with the need for ventilation came the need for close observation and other simpler treatment modalities. Thus the concept of a high dependency unit (HDU) was born, although the separation of high dependency from intensive care is still an ongoing phenomenon. Consequently the need for a suitable definition has become necessary. In my view the most concise definition is that high dependency care is intensive care without mechanical respiratory support.

A few hospitals have used high dependency units for many years, but the concept has not received any widespread interest until the last 5 years. This interest has developed as a result of the increase in major surgery and thus the need for more sophisticated postoperative care, the need to reduce costs, and the emphasis on improved quality of postoperative care driven to some degree by the NCEPOD reports. Despite this perceived need, little has been written about the use of high dependency units. Crosby *et al. (1)* reported 5 years experience of a six-bed high dependency unit. This unit was designed to take high-risk postoperative patients and in 1 year admitted 611 patients. The overall mortality was 1.9% and the admissions spanned a wide range of surgical specialties. They concluded that while high dependency care was more expensive than ward care, the improvement in the quality of progressive care provided was enough to warrant its continued use.

Further, striking evidence as to the necessity for high dependency came from the Queen's Medical Centre. Gamil and Fanning *(2)* followed the course of 2153 postoperative patients in the 24 h period after operation. The results were alarming in that 5% had serious complications during this period. Of these 29 patients, 23 died and six had severe disability. Although the evidence was subjective, the authors concluded that ten of these patients might have fared considerably better if specialised facilities were available. The patients in whom the problems occurred were, perhaps not surprisingly, major general surgery, urology, vascular surgery and multiple trauma. Despite this, the mortality rate at 24 h and 48 h was not dissimilar to previous studies *(3,4)*.

While most HDUs tend to be available to all specialties, there are some that have been commissioned for specific groups of patients. Helm and Newman *(5)* have reported the initial 2 years experience with an HDU specifically for postoperative trauma, orthopaedics, plastic and maxillo-facial surgery. The average number of admissions was 325 patients per year with a mean length of stay of 2.5 days. The audit was restricted to the 205 orthopaedic and trauma patients. They reported only one death in the HDU, although seven patients were transferred to the intensive therapy unit (ITU). This audit, albeit from a unit that is specialised, does demonstrate the importance of oxygenation, adequate pain relief and good fluid management which are the three most important principles of HDU management.

Therefore, should we be developing more high dependency units? The answer must be 'Yes' in order to use more effectively the scarce intensive care resources available in the United Kingdom. An observational study of 1168 patients admitted to a general ITU over a 4 year period *(6)* identified a group of patients (approximately 40%) in whom the risk of hospital mortality was 10% or less. The authors concluded that these patients could have been cared for in an HDU, thus reducing the stress on the ITU. Considering the imperatives of budgets and lack of resources, it is perhaps surprising that more has not been written about the use of HDUs as a method of increasing both quality of care and productivity.

In the Royal Hallamshire, Sheffield, the intensive care unit was under extreme pressure until 1991. The six general intensive care beds were almost continuously occupied and the rate of premature discharges, refused admissions and transfers to other ITUs was very high. A four-bed HDU was opened in 1992. This was situated next to the ITU to allow rotation of staff and was designed to provide care primarily for postoperative patients. To avoid this unit being used for long-term care, the unit opened for 5.5 days, closing on Saturday at midday and reopening on Monday morning. While this has disadvantages, the policy has been successful as it has achieved the aim of providing short-term care for patients after operation (approximately 90% are discharged within 48 h). In addition, only 4% are transferred to ITU for clinical needs and 2% are admitted to ITU because of the closure of the HDU at the weekend. In the time that the unit has been opened the rate of admissions has increased to a figure of approximately 350 per annum. This is the same as the annual admission rate to the six-bed ITU and thus shows a doubling of capacity. Perhaps the most important feature is that the patients on the HDU remain the responsibility of the admitting surgical team and do not, consequently, increase the workload of the incumbent ITU medical staff.

Aside from the clinical need for HDU, much emphasis has been placed on the cost-effectiveness of high

dependency, but is this true? This question remains largely unanswered. Little definitive information is available about the costs of ITU, but it would appear that the total cost is in the region of £1000 to £1500 per patient day, if all indirect costs are included. About 60% of this cost is caused by the cost of nursing staff. If a proportion of ITU patients could be treated in an HDU environment there should be a cost saving of approximately 65%, this being primarily because of the reduction in nursing costs. Sadly I fear that this view is somewhat simplistic. It is certainly true that HDU requires one nurse per two beds and thus savings are made and it is probably true that some postoperative patients leave hospital quicker if they have been treated for a limited period in HDU, although no definitive proof exists.

Despite these encouraging facts the setting up of any service creates demands, fuelled by the aging of the population, the increase in the number of complex surgical procedures and a myriad of other factors. This is borne out by our experience, in which we find that both the ITU and the HDU are now always full. One can only conclude that the setting up of an HDU will not reduce costs in any financial sense, it will limit the explosion of costs should the increase in workload be accommodated in an ITU alone.

From this background of largely unstudied growth in HDU over the last few years, where should we go in the future? I believe that it is incumbent on the profession to monitor the effects of the provision of HDU throughout the UK. No government funding appears available for this at this time, but it is surely a subject worthy of study. Perhaps this paucity of information is because HDU straddles many specialties. The figures available suggest that HDUs will curb the expanding costs of ITU and improve the quality of postoperative care. It is also possible that a reduction in the length of stay after operation may ensue. Let us hope that the growth of this facility will continue, but that the need will be calculated and its benefits measured so that the Health Service will balance need against provision. Perhaps we should learn a lesson from the lack of national guidance in the growth of intensive care, which has left us with the legacy of unevenly developed resources and all the associated problems it has produced, but which will no doubt be perpetuated.

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