Commentary

Paediatric intensive care: out of commission

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Abstract

Problems with commissioning paediatric intensive care stem both from difficulties in recruitment and retention of nurses, and from incoherent or nonexistent national audit. Pyramidal career structures and patterns of remuneration that concentrate on administrative responsibility over clinical skills underlie the former, whereas poor audit conceals variations in both service quality and demand. Epidemiologically superior data are required if we are to solve commissioning problems. We need to know what happened to every child from a defined population receiving intensive care and whether a lack of resources means that some children are denied intensive care.

Keywords audit, epidemiology, intensive, nursing, paediatric

It was recently revealed that one quarter of paediatric intensive care beds in Holland are closed [1] and that many critically ill children have to be transferred to receive care. This is not an exclusively Dutch problem. Problems organizing paediatric intensive care exist in most health care systems. If we are to avoid crises such as this then we have to solve two fundamental problems: the way in which we staff the intensive care units with nurses; and the lack of information that we have regarding the service that we are trying to commission.

Nurse recruitment, retention and funding

Paediatric intensive care nurses are a scarce resource for a number of reasons. First, they are usually required to have specific higher postgraduate training in order to work at a basic grade. Such training may not enhance their pay as compared with other nurses in other disciplines. Second, their career structure is pyramidal, which limits the opportunities for individual progression and increases the appeal of lateral career moves into less stressful environments such as community nursing or (in the UK) National Health Service direct. From the nurse's perspective, salary progression is usually linked purely to administrative responsibility and often fails to recognise significant additional practical and intellectual skills, such as intensive care training itself or additional experience (e.g. in techniques such as haemofiltration or extracorporeal membrane oxygenation). Even when additional recurrent funds are identified to commission a paediatric intensive care service, it can thus prove prohibitively difficult to open intensive care beds. Furthermore, when service provision is inadequate, problems with recruitment suffer from negative reinforcement. Jobs in a stressed service are inevitably anticipated to be stressful themselves.

There is no single answer to this problem. Centralization of care in large high volume units enables the best return from any limited resource, and it is tempting to assume that nurses will be the same as any other resource in this respect. The impact of centralization on nurse recruitment, however, has not been determined. Nurses are unlikely to commute large distances to find work in intensive care in preference to a local change in specialty.

Lack of information

Effective planning and commissioning of a paediatric intensive care service requires close audit of activity, which we lack. In many cases this lack of information conceals variation in resource provision and differences in performance. The required information is naturally specific. The capacity of a paediatric intensive care service can be described in terms of the number of physical bed spaces

PIM = Paediatric Index of Mortality.

present, but this does not reassure us that the beds are accessible. Variations in patient dependency, the numbers of nurses available and their skill mix all have to be taken into account when deciding whether a bed can be used at a given time. Even knowledge of the number of accessible beds tells us nothing about the amount of work being done. Such information can only be gained by looking at patient flow (admission rate, duration of stay, occupancy, readmission rate) and intervention rates. Even then, information regarding quality of care is lacking.

A limited view of the quality of care (its effectiveness) can be inferred from standardized mortality ratios generated using mortality prediction models. There are in essence two such models available for paediatrics [2,3]. They have considerable differences and are not universally applied. However, the use of mortality data in this way has been questioned in paediatric intensive care, where survival rates are greater than 90% and morbidity may be of increased relevance because of the potential longevity of survivors. Most literature and research using standardized mortality is based on the performance of individual units or groups of units. From an epidemiological perspective, however, it is preferable to know what happened to every child from a defined population who received intensive care (irrespective of where it was provided) and whether a lack of resources meant that some children were denied intensive care [4].

Change and variation in standards

There is evidence that increasing numbers of children are receiving or are expected to receive intensive care. In the UK (or at least in Birmingham [5]) this is occurring without a change in the intubation rate, implying that the change could represent partial resolution of an asserted shortage [6,7]. Alternatively, the clinical threshold for intervention (intubation) is falling. Paediatric intensive care space is used as it becomes available. Where there are ample resources there is a tendency to provide high dependency care and 'observation' on the intensive care unit, whereas triage otherwise limits this tendency. Hence, when great variation in the incidence of intubation is observed within [8] or between [9] health care systems, one can infer variation in resource provision. The greatest concern must be when refused admissions occur in units with high intubation rates. The appropriateness of intensive care admission or intervention ultimately still has to be judged on a case review basis.

Comprehensive audit

The development of the mortality prediction model 'PIM' (Paediatric Index of Mortality) [2] has involved a collaboration that has, among others, incorporated all paediatric intensive care delivered in Australia. The epidemiological superiority of these data will increase the influence of the conclusions drawn from it. In the UK, where we have long suffered from similar problems to those currently affecting Holland [1], some centres are also contributing to the PIM collaboration [8]. However, a system for centralized audit is also being established. First, this is being achieved through a study designed to assess the relevant mortality prediction models, which is to include morbidity (United Kingdom Paediatric Intensive Care Outcome Study, UKPICOS) [10]. The study has recruited all the major providers of paediatric intensive care in the UK. Second, the English Department of Health has commissioned a continuous audit of paediatric intensive care to follow on from that study called 'PICANET' (Paediatric Intensive care Audit Network), which will include the successful severity model. Hence, commissioners will have access to comparative, risk adjusted, performance data on which to make their decisions. All we have to do now is pay the nurses what they are worth!

Competing interests

None declared.

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