INTENSIVE CARE IN THE UNITED KINGDOM:

REPORT FROM THE KING'S FUND PANEL

MAY 1989

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Intensive care units (ICU) provide facilities which have resulted in major improvements in the chances of survival in some conditions which were previously considered life threatening; in these cases the effectiveness of intensive care is not in doubt. Yet evidence is less clear cut on the benefits and costs of treatment for the complex illnesses which now afflict the bulk of patients admitted to intensive care units. Furthermore, there is concern about the ill effects which may arise. These include loss of the patient's dignity, privacy and autonomy, and the perception (however it is founded) that some procedures may produce more harm than benefit. These issues are relevant to all medical practice but they have particular application in the case of intensive care, not least because of the high costs of intensive care provision. At a time when resources for health services are tightly constrained, it is important to ensure that the money available is used effectively and efficiently.

Against this background, the King's Fund convened a multidisciplinary panel (members are listed in the Appendix) to consider the following questions and to prepare a statement for discussion at a consensus conference.

Is there scientific evidence that ICUs cause a decrease in mortality and morbidity?

What criteria should be set for admission and discharge to ICUs?

Which classes of patients are likely to benefit most from which procedures that are carried out in an ICU?

For what extra cost is therapeutic benefit gained by using intensive care?

What scale of provision is needed in the NHS? What are the pros and cons of a large multi-specialty unit or small sub-specialty units?

The panel met on four occasions during 1988. The panel drew on the experience of its members in addressing the above questions, reviewed the published literature on ICUs, and considered papers prepared by Professor Bryan Jennett, University of Glasgow, Mr Alan Shiell, University of York, Dr Saxon Ridley, Western Infirmary Glasgow, and evidence from two surveys of ICUs prepared by the

Association of Anaesthetists and the Medical Architecture Research Unit (MARU) at North London Polytechnic.

It soon became apparent that the lack of data in the United Kingdom (UK) would make it impossible to answer the questions posed. Accordingly, the panel determined not to hold a consensus conference, but instead to produce a report summarising the current state of knowledge about intensive care, highlighting the absence of evidence, and calling for a substantial programme of research.

Definition of intensive care

A definition favoured by the panel is:

a service for patients with potentially recoverable diseases who can benefit from more detailed observation and treatment than is generally available in the standard wards and departments.

An ICU is then a place and not a form of treatment. It provides special skills and experience from medical and nursing staff for the care of critically ill patients and particularly those in whom there is expectation of failure of one or more organ systems. It also provides a centre for physiological measurements, nursing procedures and therapeutic manoeuvres which are not practicable in the general wards. Procedures undertaken in an ICU are done there on the assumption, understandable but unproven, that the concentration of special facilities and expertise gives better results and reduces costs.

What intensive care provides varies according to the activities of the relevant hospital and the predominant mix of patients admitted for intensive attention. The outcome of intensive care depends not only on the facilities provided in the unit and the skill and timing with which they are administered, but also on the case mix of problems presented by the surgeons and physicians who make the initial decisions which result in their patients requiring intensive care.

Generalisation about intensive care units may be quite inappropriate unless their heterogeneity is better recognised. Hospitals specialising in a particular condition may regard as routine a procedure considered specialised elsewhere, and so undertake it in a ward or department

other than ICU. There are relatively few conditions for which an ICU is essential, and few procedures which can only be done, or done safely, in such a unit.

Much of intensive care involves temporary replacement of the function of one or more organs, for example ventilation for respiratory failure or dialysis for renal failure, and it is in these cases of single organ failure that the best results are achieved. It is also used for monitoring to detect and respond rapidly to serious complications in patients judged to be at risk of becoming critically ill. The bulk of intensive care work in the UK today concerns the management of patients who, after trauma, major surgery or overwhelming illness, suffer from malfunction of several organs. The outcome for such patients is much more unpredictable, depending fundamentally on the severity of the presenting problems.

Criteria for admission to ICU

Primarily intensive care should be given in the expectation of beneficial consequenses when such benefits can be achieved at acceptable cost. It should not be provided in situations where possible harm outweighs the prospective benefit . Within a group of patients for whom intensive care is considered, the likely outcome of such care is a major consideration. The panel suggests that a simple scale is used:

- expected to survive; potentially recoverable (a good chance);
- prognosis uncertain;
- death probable shortly whatever is done;
- death apparently imminent.

In view of public expectations of what medicine can achieve, the panel recommend that in the UK intensive care should be considered for the first two of these categories if the costs are not prohibitive.

It may also be appropriate to admit potential organ donors (that is those patients who fulfil the criteria of brain stem death, or expected to

do so) because procedures such as mechanical ventilation are required to keep the organs in good condition. *In such cases the recommended policy is to provide optimal care for the dying patient until it is agreed that further therapy is useless, when there is a shift in emphasis from prolongation of life to the maintenance of organ viability.*
There is a more difficult problem with those whose prognosis is uncertain because these patients will eventually be reclassifiable into one of the other categories. In the absence of sound data on which to base decisions these patients should also be treated in ICUs. *It is this group for whom there is an urgent need to conduct clinical trials to evaluate the need for intensive care.*

Patients whose death is probable shortly whatever is done provide a different dilemma. It is often possible to produce temporary improvement and to allow time for relatives and the medical team to come to terms with the inevitability of death. It is in these cases that the question of benefit to the patient is most difficult to assess and here also that the question of the use of resources which might benefit others instead must be considered. *The panel recommends that each ICU should prepare a set of guidelines setting out criteria for admission to the unit to help doctors and other staff determine priorities for treatment.*

The concept of benefit

There is often disagreement about what constitutes benefit . Doctors and others disagree about the probability of the benefit and about degree of benefit that should be regarded as worthwhile. In such cases, benefit should be assessed not only in terms of survival but also in terms of the quality of life.

The concept of benefit has been the subject of numerous interpretations. The panel considered the question of whose judgement of benefit should prevail in doubtful cases. The Hippocratic (also the British and the American Medical Associations') view is that, the physician should benefit the patient according to his/her ability and judgement.

This statement is paternalistic and depends solely on the doctors'

subjective judgement. It makes no provision for the autonomy of the patient and as an extreme has even been evoked in defence of bizarre experimental therapy and of enforced feeding and unwanted invasive treatment. The panel prefers the following: *the physician should benefit the patient according to the most objective judgements available unless the patient expresses a competent and informed wish for an alternative course.*

Our firm support of the right to make an informed decision to forego intensive care or any other therapy should not be construed as an endorsement of euthanasia or assisted suicide, active or passive. Moreover the right to refuse intensive care should be exercised only by an informed person who is evidently rational and competent. In cases in which competence cannot be assessed, decisions must rest with the doctor, but always in the context of close consultation with the family, and a presumption in favour of the preservation of life must predominate. Conversely, there is no moral or legal obligation to provide treatment on request when there would appear to be no possibility of benefit.

An ability to provide a more accurate prognosis than is possible at present would help avoid some of the conflicts which arise. Severity of disease scores such as the Apache II [1] (acute physiology and chronic health evaluation) score have a good deal to recommend them, provided they are not applied rigidly in individual cases. *Selection for intensive care should be based on broad concepts of prognosis derived from statistical analysis of comparable cohorts of patients backed up by sound clinical trials. Such data are sadly deficient in the field of intensive care in the UK.*

1 The APACHE II system was developed by the ICU Research centre at the George Washington University Medical Centre, USA, to estimate the pretreatment risk of death in severely ill patients.

Criteria for discharge from ITU

Four broad situations can be envisaged:

the patient has recovered and is stable;

the immediate threat has been alleviated but the patient remains at risk unless under close observation;

the immediate threat has been alleviated but the patient is expected to die shortly;

death is agreed to be imminent, even if intensive care is continued.

Patients in the first category should be discharged as soon as possible. Those in the second may be discharged or retained depending on the needs of other patients and the available facilities elsewhere in the hospital.

Patients who are stable but expected to die can be discharged from the ICU but the panel recognised that in some circumstances this may generate a sense of rejection in patients and family at a time of particular distress. In other situations, the atmosphere of another department may be a better environment in which to come to terms with the patient's position. Competing pressures in ICU or the general ward will inevitably affect this decision.

Withdrawal of support for patients in whom the outcome looks hopeless is always difficult. Often one manifestation of the disease can be alleviated when the underlying illness cannot be reversed. This ability to achieve limited success, and the rapidity with which deterioration and death follows cessation of treatment, make it difficult to withdraw support. The decision is then how best to terminate unsuccessful management.

Sometimes it is necessary to delay implementing decisions to withdraw treatment while relatives assimilate and come to terms with the situation. Part of the cost of intensive care is incurred by responding to these humanitarian requirements as distinct from those relating simply to the patient's prognosis. But again, competing

pressures may restrict the ability of an ICU to devote more than a limited resource to caring for the terminally ill, a task which may sometimes be better undertaken elsewhere. At all stages during treatment, relatives should be kept informed of the patient's condition and prognosis, and any information about withdrawing support must always coincide with giving of information about what will be done to ensure comfort and dignity.

Criteria for the use of various interventions

The reasons for intervention in intensive care include diagnosis, monitoring and treatment. Invasive interventions give rise to most concern because they can result in unjustified discomfort, harm and unnecessary expense if used routinely rather than when specifically indicated. Careful audit is needed, particularly when procedures initiated for diagnostic purposes are continued as a means of monitoring. This progression is only justified if there is a significant risk of change and earlier or more accurate recognition of it would influence outcome. *The panel recommends that each ICU should prepare a set of written guidelines on the use of various interventions and procedures by which their efficacy may be audited in each case.*

Therapeutic interventions in the ICU are curative, supportive or prophylactic. Supporting individual functions is a major part of intensive care, designed to buy time for natural resolution or a response to other often simpler measures. This means it is difficult to equate the results of specific activities with outcome. Many of the most expensive and time consuming manoeuvres do no more than modulate results which are largely dictated by the nature of the underlying disease.

Cost/benefit relationships

There are no published evaluative studies relating cost to outcome from British ICUs. Those that are available from the USA, Europe and Australia are unlikely to be applicable to the UK because of differences in case mix, quality and availability of support. Standard methods of costing in the NHS do not allow direct calculation of ICU

costs. Current experiments with new budgeting and resource management arrangements in some health authorities may help to overcome this but the information systems which would enable ICU costs to be identified precisely are not yet part of routine health service management.

To assist in our enquiry, the King's Fund and the Centre for Health Economics at York University jointly financed and conducted an exploratory study, in collaboration with three ICUs to attempt to relate, in a systematic way, data on workload, treatment, costs and outcome. The results, though not conclusive statistically, indicate that such investigations are feasible, and potentially rewarding. *The panel recommends that priority should be given to extending this and other comparable analyses as a matter of urgency.*

Levels of provision

Current Department of Health (DoH) policy is set out in Building Note 27, originally published in 1970 and revised in 1974. This recommends that the number of beds in an ICU should be some one to two percent of total acute beds and that the average District General Hospital (DGH) should have an ICU with six to eight beds. According to recent surveys conducted by the Association of Anaesthetists and MARU, most units are smaller than envisaged by the DoH but there is considerable variety. Those units providing less than four beds and handling fewer than 200 cases per annum may be uneconomic. Such units may be undertaking too little work to provide the highest quality of care as has been suggested by the Association of Anaesthetists. There may be a case for concentrating intensive care provision in a smaller number of units each of which would have a workload large enough to enable it to develop appropriate expertise.

The absence of data on workload, outcome and costs, and the heterogeneity of ICUs, make it evident that any recommendation about future provision must be highly speculative. There would appear to be a need for flexibility and for local rather than national planning. In some situations, the patient will benefit most from specialist care at regional centres so that expensive ICU facilities would not need to be replicated in every DGH.

Recommendations

Having carefully considered the published literature on intensive care and evidence submitted, the panel has reached the view that there is a serious lack of evidence about its costs and benefits. In part, this stems from uncertainty about who is responsible for organising and managing these services, and the consequent failure to collect data about activity and outcomes. Understandably, there has been no clinical trial of intensive care as such a trial presents formidable practical difficulties. The absence of the economic evaluation of intensive care is much less defensible and requires urgent attention. Against this background, the panel recommends:

Responsibility

Each Intensive Care Unit should identify someone to be responsible for:

- ensuring the unit has a clinical policy in the form of written guidelines;
- ensuring that the above policies are implemented;
- collecting and evaluating data on the clinical outcome and costs, in general and of the care of individual patients;
- co-ordinating the clinical care of individual patients.

The person responsible need not necessarily be the same in each case. Conflicts may still arise despite clinical guidelines, so an independent mechanism for their resolution should be available.

Research

There is an urgent need for intensivists to agree what data (clinical and economic) should be collected by every ICU to allow proper audit. Especially important is the need for prospective research to evaluate certain specific practices in intensive care. Differences between units and the variability of their practices might be used to evaluate areas of uncertainty and create hypotheses which could be tested if necessary by randomised controlled trials.

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