Euthanasia: the intensive care unit

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The purpose of intensive care is to provide monitoring and organ support for patients with critical illness from which recovery is possible. Despite increasing technological and pharmacological sophistication, mortality in intensive care units remains high, with significant disability in those who survive.

Methods of predicting outcome from intensive care have been developed. These enable patients to be placed in risk groups, but do not accurately predict the outcome of individual patients. That prediction is a clinical judgement based on the underlying disease, the number of body systems failing and the length of time for which intensive care support has been necessary.

Once a decision has been made to withhold or withdraw intensive care, the principles of good palliative medicine should be employed during what will then be the inevitable terminal phase of the illness.

What is intensive care?

A modern intensive care unit (ICU) contains a large amount of sophisticated equipment. It is staffed by highly trained doctors and nurses who are supported by an extensive network of technicians and other health workers. The first major step in the development of ICUs was taken by Lassen in 1951 when he used positive pressure ventilation to treat respiratory failure caused by poliomyelitis. Since then, several attempts have been made to define intensive care. It is essentially a service for patients with potentially recoverable diseases who can benefit from more detailed observation and treatment than is generally available in standard wards and departments. It involves intensive patient monitoring both clinically and technologically. Such monitoring either detects the early failure of body systems, thereby enabling intervention to prevent further deterioration, or when organ failure has already occurred monitors the effectiveness of treatment. Central to intensive care is the support of body systems by machines and drugs. Inevitably, therefore, patients in ICUs are highly dependent and constitute a huge work load for those who look after them. ICUs contain the most critically ill patients in a hospital but the question is, ‘does recovery actually take place?’ What is the outcome of adult intensive care?
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The outcome of intensive care

Early studies of the outcome of intensive care looked at deaths within units. However, it was obvious that these figures did not give an accurate picture of outcome but that hospital mortality, mortality after discharge and the quality of life of survivors needed to be considered. Initial attempts were made to do this in the UK and North America by reviewing the outcome of patients treated with mechanical ventilation\textsuperscript{4-6}. 50\% of patients died before leaving hospital and a further 10–19\% survived for less than 1 year. Only one-in-five of all patients had returned to their previously normal life 12 months after leaving hospital.

More recent studies in the UK of all patients admitted to ICUs continue to show a high mortality with 52\% of patients being alive 2 years after leaving intensive care\textsuperscript{7}. Many of those who survive have a reduced quality of life. In American and European studies, mortality varied from 18–69\%.\textsuperscript{8} This wide range reflects the nature of intensive care case mix in different units. Nevertheless, the early and late mortality of patients requiring intensive care is high. What is the cost of such a death rate?

The cost of intensive care

It has been known for many years that the cost of intensive care is very high and that the cost per case for nonsurvivors is much greater than for survivors\textsuperscript{9}. The cost per patient day is 4–5 times that of an acute general ward\textsuperscript{10}. In one London hospital, the total cost of intensive care over 40 months was £10 million: 36.8\% of this was spent on 15.5\% of patients who died\textsuperscript{11}.

Is such a distribution of resources just? Does expenditure on nonsurvivors divert resources away from other areas of health care? If intensive care beds are occupied by patients who are not likely to survive are other patients who would benefit from intensive care denied it?

Reports in the media in 1995 about intensive care services in the UK gave no reassurance about the answers to these questions.

However, the cost of futile intensive care is not only financial but also human. Where survival is very unlikely the process of dying is prolonged. False hopes are raised for the relatives as well as drawing out their anxiety and distress. Staff may become demoralised as they realise that, despite their efforts over many days and sometimes weeks, death is inevitable.

The cost of inappropriate intensive care has been summarised by Jennett\textsuperscript{12}. It may be: unnecessary because the same end could be achieved by simpler means; unsuccessful because the condition is beyond influence;
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unsafe because the risks of complications outweigh the probable benefits; unkind because the quality of life afterwards is unacceptable; unwise because resources are diverted from more useful activities.

There is, therefore, a responsibility on intensive care specialists to direct their skills and resources to those who are likely to recover. Indeed, it is the potential for recovery which should be the criterion both for admission to an ICU and for continued intensive care treatment\(^2\). In trying to exercise this responsibility several questions arise. Is it possible to distinguish between those patients who will recover and those who will not? How accurate is the science of prognosis in intensive care? Is it possible to know when intensive care treatment is increasing the chance of survival or simply prolonging dying? Can we be as confident as the old woman pauper in Oliver Twist who declared that she knew 'when death’s a coming'?

These questions have exercised the minds of doctors and others for more than two decades. 'The issue of life versus death is placed in sharper focus than ever before because our ability to keep people alive for weeks or more with critical illness has improved greatly with advances in technology. Those of us who are placed in positions of responsibility and leadership for the care of the critically ill are forced to make decisions which may involve discontinuing support\(^{14}\).'

Predicting outcome in intensive care

Predicting the outcome of disease has long been part of medical practice. The outcome of malignant disease is formulated on the basis of clinical trials and series of cases, as the percentage of patients with a given stage of the disease surviving after a specified number of years. Some of the earliest attempts to predict outcome in critical illness were made in head injuries\(^{14}\), and in non-traumatic coma\(^{15}\). These were particularly important in helping clinicians decide whether or not to continue with intensive care treatment in patients with severe brain damage as they made it possible to quantify the risk of death and severe disability.

However, while critical illness may be precipitated by major trauma or a single underlying disease, usually several body systems are affected. This is more pronounced where there is also chronic disease, such as ischaemic heart disease and irreversible obstructive pulmonary disease. Predicting outcome in these circumstances requires the construction of a profile of the patient’s disordered physiology. Several attempts have been made to do this but the one that has featured most prominently in recent years is the acute physiology and chronic health evaluation or APACHE, developed by Knaus and his colleagues at the George Washington
University Medical Center to study ICU outcome and utilization and evaluate new therapies\textsuperscript{16,17}.

In the commonly used APACHE II system, a score of 0 to 4 is assigned to each of 11 objectively measured physiological variables. Points are also assigned to the Glasgow Coma Score, the patient’s age and precisely defined chronic health status. The system is independent of therapy, valid over a wide range of diagnoses and is based on data available in most hospitals. There is a clear relationship between the APACHE II score and the risk of death. In its original validation in 5815 patients in 13 ICUs\textsuperscript{17}, there was a predictable increase in death rate for each 5 point increase in the score. Thus, with a score of 5–9 there was a death rate of 3.9\% rising to 84\% for scores greater than 35. The underlying disease was a major factor in determining the risk of death. In congestive cardiac failure, for example, there was a risk of death of 13\% with a score of 10–19. This risk doubled for the same score in septic shock.

A similar pattern was found in a multicentre study in the UK of over 9000 ICU admissions, although there were differences in the case mix between units\textsuperscript{18}. The APACHE system stratifies critically ill patients into risk groups. It does not allow the risk of death for individual patients to be predicted. As one commentator has pointed out, ‘a predicted risk of death of 50\% identifies a critically ill population but it also tells us that for any patient within that mortality band the outcome could not be more uncertain’\textsuperscript{19}.

Several attempts have been made to formulate more precise methods of predicting outcome. Knaus carefully defined organ-system failure for the cardiovascular, respiratory, renal, haematological and neurological systems\textsuperscript{20}. In a study of 5677 ICU patients in 13 hospitals, 2140 patients (38\%) had one or more organ-system failure on admission and a further 579 (16\%) developed organ-system failure after admission. Outcome depended on the number of organ-systems failing and the length of time for which they had failed. 80\% of patients with more than three systems failing during the first 24 hours of admission died (20\% of course, surviving). But if a three system failure continued for more than four days, all the patients died.

Another approach has been to perform an analysis of the daily trend in the APACHE score\textsuperscript{21}. These trends have been combined in computerised programmes with the organ-system failure score and adjusted for specific diagnostic categories and used to refine prediction further\textsuperscript{22}. However, even these sophisticated systems have a false positive rate. In a study from Guy’s Hospital, of 137 patients predicted to die, 6 survived\textsuperscript{11}. In another unit, 119 patients were predicted to die but, of these, 24 were discharged home\textsuperscript{23}. Furthermore, scoring systems are not very sensitive. In the Guy’s study, for example, although 137 out of 3702 patients were predicted to die, 560 actually died.
Thus, while scoring systems are a useful tool for audit within and between ICUs, a recent European Consensus Conference rightly concluded that they are an inadequate basis for making treatment decisions about individual patients already in ICU or for conducting a preadmission triage. However, scoring systems do give a pointer towards the direction in which a patient is moving. They provide clinicians with more knowledge about groups of patients than they can ever hope to acquire in their own practice. They also identify the factors which must be considered in making decisions about individual patients.

Age is an important factor. Older patients do less well than younger ones. The underlying pathology is crucial as prognosis is different for different conditions. The number of body systems failing, and the degree of technological and pharmacological support they require, also have a profound effect on outcome. Most important of all is time. Each day a careful assessment should be made and the question asked, ‘is this patient’s condition improving or deteriorating?’ A progressive deterioration over several days in the face of intensive care support is an indication that such support is prolonging dying rather than saving life.

The decision to withdraw intensive care treatment in the expectation that death will follow is an informed judgement. In our present state of knowledge, it cannot be more than that.

The management of terminal illness in ICU

It is helpful to discuss the decision to withhold or withdraw intensive care treatment with all those involved in the patient’s management. The general practitioner often contributes important information about the patient’s previous quality of life as well as much wisdom about what is appropriate in patients they have known for many years. In this way an informed consensus is arrived at.

Because the onset of critical illness is usually rapid, the patient’s wishes are mostly not known. Clouding of consciousness by the underlying disease or by drugs used necessarily in intensive care makes it difficult to establish what those wishes are. Advance directives do tell clinicians what those wishes were, but they still leave them with the task of identifying when intensive care is futile and, therefore, of when to comply with the directive. Hence discussion with those close to the patient plays an essential part in the decision making. While for incompetent patients the doctor alone may lawfully decide what is in the patients best interests, relatives need both to understand and accept when continuing intensive care is indeed futile.
The principles of terminal care in an ICU are the same as those in palliative medicine. Their adaptation to terminal critical illness was described a decade ago\(^2\)\(^6\).\(^2\)\(^7\). As technological and pharmacological support are withdrawn, adequate doses of opioids and other drugs should be used to prevent pain, breathlessness, the accumulation of secretions and other distressing symptoms. Particular problems occur when patients are dependent on mechanical ventilation with high concentrations of inspired oxygen and/or high doses of inotropic drugs. Rapid withdrawal of these results in almost immediate death which, from the point of view of the relatives, may seem indecently sudden. The reduction of the concentration of inspired oxygen and/or the dose of inotropic drugs over a few hours gives the relatives time to say 'goodbye' and in being supported by staff, begin their bereavement.

**Conclusion**

Is to withhold or withdraw intensive care and change the direction of care to the relief of symptoms, euthanasia? Certainly death in such circumstances is quiet and dignified (it is a common misconception that death in an ICU is unseemly and undignified). But the fact is that when life-sustaining treatment is stopped death does follow. The alternative is to continue to employ all the resources of intensive care and to treat each new complication as it arises. Such a process may sometimes go on for weeks. The question is which course of action best reconciles a doctor's duty to benefit patients but not to harm them and to use resources effectively for the many but not thereby disadvantaging the few?

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