

# Introduction and Executive Summary

**“The patient’s recovery will be watched not only by nurses but by electric eyes too. Sensing devices will constantly monitor his heart rate, his temperature, his respiration rate, his electrocardiogram, and the blood pressure both in his veins and in his arteries. The nurses will not rouse the patient early in the morning to poke a glass thermometer between his gums and then spend much of the day checking up on his and the other patients’ conditions. They will simply push a button at the console of their station to get as many readouts as they want. The patient will not have to hope that if he enters a crisis somebody *may* spot it.**

**If any single bodily function or combination of functions deviates beyond the fixed limits the patient’s Physician has programmed into a computer, lights will flash and a buzzer will sound the-alarm Within seconds, nurses, technicians, doctors, and-plete array of equipment will be in action at his bedside.”**

*—Life Magazine, December 2, 1966unun*

**“Physicians tend to be unimpressed with the published descriptions of units and their working. It often seems to them that the assessment of the results is naive, survival being taken as equivalent of a life saved. They suspect that, however expert the handling of the apparatus, there is often a shallow understanding of the disease and an over-readiness to employ the most dramatic treatment;. . . One is tempted to SAY that treatment is often more intense than careful . . .**

**I believe, therefore, with many of my colleagues, that the attempt to segregate all medical emergencies on a basis of apparatus need will prove to have been an aberration.”**

*—Professor A. C. Dornhorst, April 1, 1966*

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## INTRODUCTION

Intensive care units (ICUs) exemplify the best that American medicine has to offer—teams of dedicated professionals using the latest technology to save lives that in the past would have almost surely been lost. Formally developed only in the late 1950s, ICUs are present in almost 80 percent of hospitals in the United States. They are estimated to consume between 15 and 20 percent of the Nation's hospital budget, or almost 1 percent of the gross national product. Yet, despite such large expenditures of public and private resources, there has been remarkably little critical evaluation of the effectiveness of ICU care by either the public or the medical profession.

In recent years, however, there has been growing public and professional awareness of the emotional torment suffered by the patients and their families related to the use of “lifesaving” medical care which does not really benefit the patient. Correspondingly, there has been increasing support for the notion that patients have the right to reject measures that will prolong their lives without improving their condition.

Along with the increasing public recognition that there are times when extraordinary medical care should not be employed, three key developments have made this an opportune time to analyze the costs and benefits of ICU care. First, the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research issued a comprehensive report in March 1983 on the medical, ethical, and legal issues underlying decisions on whether to forego life-sustaining treatment for seriously ill patients (191). The recommendations of the expert commission have direct bearing on decisionmaking for many ICU patients.

Also in March 1983, a Consensus Development Conference sponsored by the National Institutes of Health (NIH) formally evaluated the efficacy

and appropriateness of critical care medicine<sup>1</sup> for the first time (176). The Conference Report examines the evidence for efficacy of critical care medicine for various clinical problems and provides recommendations for organization and administration of ICUs.

Finally, in April 1983, Congress enacted a prospective payment system for Medicare in the Social Security Act Amendments of 1983 (Public Law 98-21). This new payment system, which began to be phased in over a 3-year period beginning in October 1983, will dramatically alter payment for services provided in ICUs by placing a limit on the amount of reimbursement available for different categories of illnesses. These limits may have a significant impact on the services available for critically ill patients.

This case study has two purposes. The first is to present what is currently known about ICUs in terms of the distribution of ICU beds, the costs of maintaining ICUs, the utilization of ICUs, the characteristics of ICU patients, and the outcome of ICU care. There are still important gaps in the data, but a substantial body of knowledge exists about the technical aspects of ICU care. The ICU is examined as a discrete medical technology.

The second purpose of the study is to establish a framework for considering some of the clinical, moral, and legal issues that arise with respect to ICU care. The study explores, for example, the factors unique to the ICU that sometimes lead physicians to continue life-support for patients who have minimal hope of improving. It discusses ways in which patients can make known their wishes about foregoing or discontinuing life-support if their condition deteriorates and how physicians and family members can decide whether to terminate life-support when the patient is not capable of making such a decision. It also con-

<sup>1</sup>This case study defines both “intensive care” and “critical care” as care provided in separate hospital units generally known as “intensive care units.” See ch. 2 for a discussion of definitions.

siders how ICU treatment might be rationed in the future if it becomes necessary to do so.

As is shown in the review of data on costs and benefits of ICU care, the ICU is often an effective, lifesaving technology. However, it is effective at a high cost. Indeed, partially because of its success in many clinical situations, it will not be easy to simply find and eliminate the “waste” in ICUs. Changing the economic incentives for provision of ICU care, as under Medicare’s new hospital payment system, has not made it any easier for patients, families, and ICU staffs who frequently face difficult decisions about how aggressively to treat individual patients. Indeed, as the case study explores, the new prospective payment system may make ICU decisionmaking even more difficult and contentious than in the past.

## EXECUTIVE SUMMARY

The ICU has been called the hallmark of the modern hospital but has come into existence only over the last 25 years. Initially, the ICU was an expansion of the surgical recovery room and was subsequently an outgrowth of the respiratory care units made possible by the development of the mechanical ventilator.

Today, almost 80 percent of short-term general hospitals have at least one ICU. **Overall, 5.9 percent of total hospital beds in non-Federal, short-term community hospitals in 1982 were beds in ICU and coronary care units (CCUS).** Beds in other types of special care units, including pediatric, neonatal, and burn units, add another 1 percent to the total complement of special care beds.

ICU beds are reasonably evenly distributed among all sizes of hospitals, regions of the country, and types of hospital sponsorship. Over the last 6 years, the number of ICU beds has risen abouts percent a year, compared to a rise of general hospital beds of only 1 percent a year. A major rise of ICU beds occurred between 1979 and 1981, particularly in hospitals of greater than 500 beds. Federal and State policy, particularly certificate-of-need laws and Medicare reimbursement

The case study focuses on adult ICUS and not neonatal, burn, or cardiac units. While some of the issues raised here are applicable to these other specialized care units, these other units generally present different clinical, ethical, and public policy issues. Certainly, all units treat seriously ill patients. However, the moral, ethical, and legal problems raised by withholding care for seriously handicapped newborns, for example, differ from the problems raised by withholding care for an elderly person with a terminal condition. The issues related to treatment of such infants, which has been the center of the recent “Baby Doe” controversy, deserve separate attention. Likewise, as the study emphasizes, coronary care patients are clinically different from general intensive care patients.

policy until 1982, probably contributed to the continued expansion of ICU beds and ICU utilization.

For a number of technical and conceptual reasons, an accurate estimate of the cost of ICU care is difficult to make. For example, there is disagreement on whether consideration of ICU costs should include the room and board costs of ICU care only, the room and board and ancillary care costs of patients while in the ICU, or the incremental costs of ICUs above that which the hospital would have to bear in any case for seriously ill patients. The national average per diem charge in 1982 of an ICU bed was \$408 compared to a regular bed per diem charge of \$167, a ratio of about 2.5:1. However, it is likely that the true cost ratio is closer to 3-3.s:1. In addition, ICU patients consume a greater proportion of ancillary services, particularly laboratory and pharmacy services, than regular floor patients.

Based on these and other considerations, **it is estimated that the costs of adult ICU and CCU care—the cost to the hospital patients while they are in the special care unit—represents about 14 to 17 percent of total inpatient, community hospital costs, or \$13 billion to \$15 billion in 1982.**

Inclusion of the other types of specialized and Federal hospital ICUs would bring the percentage up to about 20 percent.

### Utilization of ICUs

According to 1979 Medicare data, 18 percent of Medicare discharges included a stay in intensive care (including coronary care) in that year. Unfortunately, similar data are not available for the entire population. From reports from individual hospitals, however, certain general utilization patterns do emerge (these reports are weighted towards large and teaching hospitals). The representation of the elderly in ICUs seems to be the same or slightly more than in the hospital as a whole. Poor chronic health status, rather than age, appears to be a predominant factor limiting use of ICUs in individual cases in the United States. In comparison to the United States, ICU patients in other countries have a significantly lower mean age.

There is no accepted classification scheme that describes the clinical characteristics of ICU patients, largely because ICU patients are a heterogeneous population who have multiple underlying medical problems and who exhibit varying physiologic disturbances. **ICU patients range from those who are in the ICU primarily for monitoring for potential disturbances to those who are critically ill and receive life-supporting treatment and continuous intensive nursing and physician care.**

### Outcomes of Intensive Care

Unfortunately, it is difficult to separate the intensity of care from the setting in which it is provided, and therefore, to know whether intensive care would be as effective if provided on the general hospital floor as in the physically and administratively separate ICU. Many believe that randomized clinical trials of ICUs, at least for unstable patients, are currently unethical, because ICU care has become the accepted and standard mode of treatment in the United States for most severely ill and injured patients.

A recent NIH-sponsored consensus panel found that it is impossible to generalize about whether

ICU care improves outcome for the varied ICU patient population. The panel felt that ICU intervention is unequivocally lifesaving for some conditions, particularly where there is an acute, reversible disease such as drug overdose or major trauma. There is less certainty about the effectiveness of ICU care in other conditions, particularly in the presence of a severe, debilitating chronic illness, such as cancer or cirrhosis of the liver. **Investigators believe that underlying disease is probably the most significant predictor of the outcome of ICU care, although patient age and severity of illness are also important.**

Recent data have emphasized the inverse relationship between the cost of ICU care and survival. At this time, however, there are no accepted methods for determining ahead of time which patients will benefit from additional ICU care. From a number of studies, it is clear that the sickest ICU patients, many of whom do not survive, consume a highly disproportionate share of ICU charges. Two recent studies, for example, found that 17 and 18 percent, respectively, of the ICU patient population generated half of the ICU charges. Moreover, charges do not account for the substantial cross-subsidization of costs between ICU patients. It is likely, then, that the true proportion of costs consumed by the sickest ICU patients are substantially greater than even the charge data suggest.

At the other end of the ICU patient spectrum are patients in the ICU primarily for monitoring of the development of a life-threatening complication. Some of these patients may be able to be cared for safely and more cost effectively outside of the ICU, either in intermediate care units or on regular medical floors. On the other hand, there may be a population of ICU patients who are discharged prematurely from ICUs. Research has only recently begun to better define which patients should be routinely monitored in an ICU and which would do as well or even better if cared for on other floors in the hospital.

Another consideration in deciding whether a patient should be cared for in the ICU is the reality of adverse effects of ICU care, so-called iatrogenic illness. A list of major iatrogenic complications of prolonged ICU care has been identified. Nos-

comial infections—i. e., infections that were not present or incubating at the time of hospital admission—and various serious psychological reactions are particular complications of ICU care.

### Payment for ICU Services

To the extent that insurers distinguish ICU care from other hospital care for purposes of payment, the result has been to reward ICU care relative to care in intermediate level special care units or on general floors of the hospital. For example, in 1980, Medicare tightened the existing payment limits on routine bed costs but not on ICU bed costs—the so-called “section 223 limits.” Furthermore, utilization review efforts generally have not considered the appropriate level of care within the hospital.

Medicare’s inpatient hospital payment policies, however, have now changed dramatically as a result of the passage of the Social Security Act Amendments of 1983 (Public Law 98-21). Under the relatively new system, hospitals receive a fixed payment per discharge based on the patient’s principal diagnosis. The classification system, which identifies 467 different clinical conditions called diagnosis-related groups (DRGs) appears ill-suited for describing certain types of patients cared for in ICUs. DRG payments are based largely on a single diagnosis. Yet, ICU patients often have multiple serious underlying illnesses. For these patients, designation of a single, principal diagnosis is likely to be arbitrary, and the resources used due to the presence of additional diagnoses would not be accounted for.

In addition, the DRG scheme does not take severity of illness into account. For some diagnoses, particularly noncardiac medical conditions, the DRG category does not reflect the use of ICUs for the more severely ill patients with that principal diagnosis. For example, only 3.5 percent of the average total hospital stay for Medicare patients with cirrhosis (DRG 202) represent ICU days. Yet, the sickest patients with cirrhosis are among the highest cost ICU patients.

Furthermore, the outlier policy that the Health Care Financing Administration has implemented pays hospitals less than the marginal costs of car-

ing for the sickest ICU patients. **In short, it appears that under Medicare’s DRG payment system, the sicker ICU patients will be substantial financial “losers” to the hospital.**

### Decisionmaking in the ICU

The new incentives of the DRG payment system may conflict with an ICU decisionmaking environment in many hospitals in which the cost of care has been of minor concern in the past. Indeed, a number of factors, some of which are somewhat unique to the ICU, have led to a decisionmaking process that often has led physicians to provide life-support care in the ICU after the initial rationale for doing so no longer exists. Factors that have created an ICU treatment imperative include:

- The highly technological nature of ICU care, which often results in focus on the technical details of treatment rather than the rationale for continued treatment.
- The nature of ICU illnesses, which often require “technologically oriented” treatment even when the primary intent is to provide comfort rather than cure to a desperately ill patient.
- Traditional moral distinctions in medicine that in some cases result in more care than the patient would choose if able to do so.
- Diffusion of decisionmaking responsibility, especially in relation to decisions to forego or terminate life-support.
- Problems of informed consent in the ICU where many patients are temporarily or permanently incompetent.
- The practice of defensive medicine by physicians, which involves taking or not taking certain actions more as a defense against potential legal actions than for the patient’s benefit. Defensive medicine may be a particular problem in the ICU, because of the life-and-death nature of ICU care, the relative visibility of ICU decisions, and great uncertainty about likely court decisions on these kinds of cases.
- A payment environment which, until 1982, provided financial rewards to hospitals and physicians for provision of ICU care. Physi-

cian payment methods continue to pay generously for the procedure-oriented ICU care.

- The absence of a data base for the common ICU conditions on which to make reliable clinical predictions of individual ICU patients' chances of immediate and long-term survival.

### Foregoing Life=Sustaining Treatment

The Critical Care Consensus Development Conference sponsored by NIH has concluded that it is not appropriate to devote limited ICU *resources* to patients without reasonable prospect of significant recovery or to simply prolong the natural process of death.

In general, a terminally ill patient's right to forego or discontinue life-sustaining treatment has been established and is usually protected by the constitutional right to privacy. Practical difficulties arise when the patient is not competent to decide, and when other decisionmakers, including physicians, families; and patient surrogates, do not agree on what medical treatment to pursue. State courts have differed on the decisionmaking procedures to use when a patient is not able to choose for himself.

Recent court decisions differ even over when a patient is considered "terminal" and over what constitutes "medical" treatment. Likewise, many courts have continued to invoke a distinction between ordinary and extraordinary care, while some have explicitly rejected the distinction.

### Possible Future Steps

Because of the increasing burden of medical care costs on individuals and on society as a whole, it is likely that the funds available for intensive care will be much more strictly limited than in the past. Because Medicare's DRG payment system in general makes many ICU Medicare patients financial losers for the hospital it may, therefore, alter the prevailing provider attitudes about the appropriateness and extent of ICU care in individual situations.

In recent years, the number of ICU beds has expanded to meet increased demand for beds, except in public hospitals in financial distress or at

times when there was a shortage of ICU nurses to staff available beds. In the future, there will need to be greater attention paid to how to ration ICU beds. The DRG system used by Medicare is a form of "implicit" rationing, because the payment limitations place greater pressures on physicians and hospitals to make resource allocation choices without setting "explicit" limitations on services or eligible patients. Under this form of rationing, there will be a need to consider expanding the procedural safeguards used on behalf of patients who become major financial losers for the hospital. ICU decisionmaking will become even more difficult than it has been in the past due to potential financial conflict between patients, physicians, and hospitals.

A number of steps might improve the environment for intensive care decisionmaking:

- Research on developing accurate predictors of survival for patients with acute and chronic illnesses could be expanded in order to permit better informed decisions based on the likelihood of short- and long-term survival. In the absence of valid and reliable data, hospitals could consider formalizing an institutional prognosis committee whose function would be to advise physicians, families, and patients on the likelihood of survival with ICU care.
- The suitability of the current DRG method of payment for ICUs should be tested and modified if necessary to take sufficient account of severity of illness.
- The legal system may need to recognize the possible conflict between malpractice standards which assume quality of care that meets national expert criteria, and a decisionmaking environment in which resources may be severely limited.
- Health professionals who are involved in decisionmaking on critically ill patients might benefit from more education in medical ethics and relevant legal procedures and obligations.
- The actual decisionmaking process for critically ill patients may need greater attention. For example, hospitals might explore formalizing decisionmaking committees to lessen the

burden on individuals faced with difficult choices about terminating life-support. More generally, society will need to decide how it wishes conflicts over decisions on terminating life-support to be resolved—i.e., in courts,

through formal hospital committees, through government-imposed procedures which can follow fixed rules and regulations, or other, perhaps more decentralized, mechanisms.