The New Practice of Critical Care Medicine

The panorama of techniques now available for preserving vital functions in the critically ill or injured patient were essentially unknown 20 years ago. For practical purposes, it has been less than a decade since intubation and mechanical ventilation, volume repletion guided by measurements of central venous pressure, and cardiac resuscitation by the use of defibrillators and pacemakers have come into general use outside of the operating room. Progress in the field has been accelerated by the availability of competent monitors which indicate the need for immediate intervention and confirm the appropriateness of resuscitation. In this issue, Safar and Grenvik (page 535) provide a comprehensive review of the organization and staffing of critical care units. These units provide the personnel and facilities which are essential if the full benefits of these techniques are to accrue to the critically ill or injured patient.

The physician who is called to the bedside of the critically ill patient is confronted by an array of monitors. The traditional techniques of physical diagnosis are essential for competent understanding of the patient's clinical status. However, at time of crisis, more direct and quantitative measures of the patient's physiologic status are needed. Auscultatory changes in the lung and the detection of peripheral cyanosis are likely to fail as competent indicators of pulmonary failure. The physician must be prepared to obtain an arterial blood sample for analysis of blood gases and blood pH. Alterations in cardiac rhythm may be detected by cardiac auscultation or palpation of a peripheral artery, but they are interpreted on the basis of the electrocardiogram. Neck vein distention and hepatic enlargement are not sufficiently sensitive as signs of limited cardiac competence and the clinician is called upon to insert a catheter into the right atrium or into the pulmonary artery to provide him with information on cardiac status.

Guided by a combination of clinical, physiologic, and laboratory findings, the physician in the critical care environment is prepared to insert a nasotracheal or oral tracheal catheter and to institute mechanical ventilation. In instances of acute circulatory failure, he increases vascular volume by a systematic technique of "fluid challenge" or he supports myocardial function by administration of inotropic drugs such as digitalis or isoproterenol. If a life-threatening alteration in cardiac rhythm presents itself, he must be prepared to use either pharmacologic or electrical methods by which an effective rhythm is restored. His competencies cross traditional specialty lines. In their analysis, Safar and Grenvik recognize no fundamental differences between surgical and medical patients. The justification for splintering resources by the creation of separate facilities, with individual administrative and operational identities physically remote from one another in the same hospital, precludes maximum availability of qualified staff, facilities, instrumentation and supplies. Equally important, it curtails opportunity for a team approach for nowhere is the need more urgent than in the critically ill patient who usually has multisystemic disease or injury. This does not imply that special physical arrangements should not be made to accommodate patients in specialty care areas such as coronary or renal units. However, these should be physically adjacent and administratively closely related to the larger critical care service.

It is unlikely that Safar and Grenvik's position that critical care is a 24 hour per day seven day per week service by well trained physicians, prepared to take incisive action to sustain patients' vital functions, will be disputed. However, there is likely to be concern with the firm position taken by the authors that critical care service should be provided by full time physicians who assume primary responsibility for patient care. Perhaps it would be best if the concepts of "in house" and "full time," which tend to excite discomfort for reasons of tradition, were replaced by "dedicated" care.

There is both precedence and a rational basis for dedicated care during a limited interval of a patient's illness, when such care serves to improve the outcome of management. The anesthesiologist in
the operating room serves as a direct parallel. A physician at the head of the operating table dedicates himself to preserving the patient's vital functions during surgery. During the course of an elective procedure, such as a hysterectomy, the intraoperative mortality in major institutions is not likely to exceed 3 per 1000 or 0.3 percent. Even in Safar and Grenvik's center, the overall mortality in their intensive care unit ranges from 15 to 20 percent. In instances of acute myocardial infarction complicated by congestive heart failure or heart block, the mortality exceeds 50 percent and in bacterial shock, the mortality usually exceeds 70 percent. On the basis of such parallels, there would be between 50 and 200 times as much justification to maintain a dedicated physician at the bedside of a critically ill patient to maximize the preservation of life.

It is true that such a calculation fails to take into account the difference in the time commitment between the anesthesiologist in the operating room and the physician in the critical care unit. However, if the services of a dedicated critical care physician are provided for a group of ten or more patients, the proportionate time commitment per patient in the critical care unit does not actually exceed that provided by the anesthesiologist during the course of a surgical procedure. Although the increasing competence of nursing specialists in critical care and especially in coronary care units is remarkable, they substitute rather than replace expert medical care of patients at times of acute respiratory crisis, complex cardiac arrhythmias, or massive hemorrhage. The argument favoring their independent roles is even less easily sustained than it is for the nurse anesthetist.

With the potent resources now at our command, our priorities must be reassessed. The skills of the highly skilled physician are often used for the purposes of routine out-patient services, whereas the care of the most seriously ill is more likely to be left to nursing staffs or physicians in training. It is on this basis that we must look to well-trained physicians who will provide dedicated service in the critical care environment in close collaboration with primary physicians and consultants. The more occasional practitioner who is less likely to anticipate problems of electrical safety, induced arrhythmias and faulty operation of equipment, to name but a few, may be subject to both professional and legal pressures. It is more appropriate for him to defer primary responsibility to a colleague who is in a better position to assume it and maintain minute by minute professional allegiance to the patient's care during the relatively brief interval of his immediate life-threatening condition.

Once it is established that critical care medicine is a dedicated service, the profession will face the formidable task of recruitment and training of physicians. At the present time, two year programs of post-residency training are being established in a few centers including Safar and Grenvik's and in our own. For this interdisciplinary specialty, physicians trained in internal medicine, anesthesia, and in general surgery and its specialities, each has backgrounds that provide essentially comparable qualifications to embark on this training. The interest of young physicians is great, but the attraction of sufficiently large numbers of trainees will require that the profession give viable evidence that critical care medicine as an interdisciplinary specialty has come of age.

Max Harry Weil, M.D. and Herbert Shubin, M.D.
Los Angeles

Reprint requests: Dr. Weil, USC School of Medicine, 1322 North Vermont, Los Angeles 90027

The Chest Physician and Intensive Care

Can the cardiologist treat arrhythmias effectively without an understanding of the implications of arterial gas abnormalities or acid-base fluctuations? Should we classify the "pulmonary clinician" as well-trained if he does not have thorough training in the recognition and treatment of cardiac arrhythmias? (The incidence of arrhythmias secondary to acute respiratory insufficiency is often as high or higher than the incidence of arrhythmias occurring in the coronary care units.) Challenged with these questions, we must conclude that a rigid dichotomy between the disciplines of cardiology and pulmonary disease is an artificial and dangerous division. The practitioner and teacher who treats "the lungs" must understand the function and diseases of the circulatory system; the cardiologist who will not cross the threshold of the pulmonary function laboratory creates a super-specialty which in reality does not exist. Thus defined, the chest physician is a clinician who is well-versed in the disciplines of respiration, circulation, and allied systems. The urgency for dialogue between these disciplines was the stimulus for the recent establishment of a cardiopulmonary committee (Chest, February, 1971, page 242). At an organizational meeting, the committee members noted that "the lung and the heart are component parts of a biological system for aerating the blood and delivering it to tissues and organs; the malfunction of one