that of initiating, stimulating, and enhancing the dialogue among the subspecialties that comprise the readership of CHEST. Indeed, this is the challenge that was originally enunciated by Dr. Soffer in 1980.\(^1\)

And this is the challenge that we look forward to meeting now and in the months and years ahead.

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ICU Scoring and Clinical Decision Making

There are three major ICU scoring systems currently available: MPM II,\(^1\) SAPS II,\(^2\) and APACHE III.\(^3\) The current iterations of these prognosticating tools offer large, validated databases against which individuals or groups of patients may be compared. These databases have been proven useful in comparing groups of patients for reasons of quality assurance or when enrolled in randomized studies.\(^4,5\) However, using these systems in making clinical decisions involving individual patients remains the subject of contentious debate.\(^6,7\) Three potential applications of these systems to decision making involving individual patients have been proposed: (1) as a means of patient triage for ICU admission; (2) as an aid to making discharge decisions; and (3) as an aid to clinicians who are contemplating withdrawal of life support in the ICU.

The reliance of systems such as SAPS II and APACHE III on multiple physiologic parameters make them appear attractive to clinicians seeking to devise physiologically based admission and discharge criteria. Unfortunately both of these systems are based on data obtained from patients who have already been admitted to the ICU, a fact that precludes the meaningful comparison of patients being considered for ICU admission to the database. MPM II can be calculated at the time of ICU admission; however, this prediction model does not encompass many physiologic parameters at the time of ICU admission.\(^1\) Furthermore, no current studies have been done evaluating this or the other two databases as a means of triage for prospective ICU patients.

Recently, APACHE III and elements of the Therapeutic Intervention Scoring Score (TISS) have been combined to generate a probability estimate of a patient requiring active treatment the next day.\(^8\) The authors imply this estimate may be useful in making discharge decisions based on the assumption that those patients unlikely to require active life-support treatments such as those in TISS would also be unlikely to be readmitted to the ICU if discharge occurred. In this study, the most important determinants of next day risk for life support were the current day’s therapy and the APACHE III score. Patients receiving interventions such as controlled ventilation, vasoactive drugs, or balloon tamponade for esophageal varices would make poor candidates for discharge from the ICU the next day is hardly surprising. Furthermore, because discharges were not actually performed in this study on the basis of the predicted risk of next day intervention score, the usefulness of this approach for this purpose remains unproven.

Limitations of care at the end of life have become a commonplace occurrence in the ICU.\(^9\) The Society of Critical Care Medicine is supportive of such limitations saying in its consensus statement on the triage of critically ill patients: “Patients with little or no anticipated benefit from further ICU treatment may be discharged or transferred from the ICU. Patients with terminal, irreversible illness who face imminent death should be excluded from the ICU.”\(^10\) Ideally the ability of a prediction system to discern which patients will die offers the possibility of providing for the fair allocation of expensive and limited ICU resources subsequent to ICU admission, a principle termed distributive justice.\(^11-13\) The mechanism of such rationing would have to be highly specific in the determination of who is going to die, resulting in few patients surviving if care is continued or withdrawn.

In a series of patients in whom care had been withdrawn on clinical grounds, Lee and colleagues\(^14\) found predicted mortality scores by APACHE II on ICU admission to be 61+/−22%. Presumably these scores would likely have risen before the decision to withdraw support. Interestingly, in Lee’s study four patients survived to discharge confirming that the specificity of clinical judgement in this matter is less than perfect. Issues of sensitivity and specificity are also crucial to the potential application of ICU scoring systems to enhance clinical judgement in this most important clinical decision.

A recent study by Rogers and Fuller\(^15\) using daily APACHE II scores and threshold values for 100% predicted mortality devised by Chang,\(^16\) found several survivors among those predicted to die. In addition, raising in the threshold values of predicted mortality to avoid a false prediction of death reduced the sensitivity of the predictive instrument to where few patients would have been candidates for the
termination of care on this basis alone. Applied in this manner, ICU scoring systems are neither specific enough to sanction the use nor sensitive enough to be practical. This study, and that of Lee et al, highlight the “dilemma of distributive justice” in intensive care: owing to the probabilistic nature of these databases, no objective system of mortality prediction is capable of removing this difficult decision from the subjective, imperfect hands of the clinician in conjunction with patients or their surrogates.

Watts and Knaus acknowledge, “prognostic systems will never be able to predict outcome with 100% specificity, and high severity scores therefore never will be indicative of absolute irreversibility of disease or impossibility of survival.” Although potentially aided by ICU scoring systems the decision to withdraw intensive care support, like the decisions to admit and discharge patients, remains the domain of the clinician. Additional studies, showing clinical benefit actually using these tools to make decisions would be required to justify otherwise.

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The Disruptive ICU
An Issue To Lose Sleep Over?

Although mortality and morbidity remain excessive among critically ill patients, the modern ICU epitomizes perhaps more than any other single environment the technologic and scientific strides that medicine has made toward sustaining life. However, have certain important basics of general medical care been forgotten, or even adversely affected, by undue emphasis on such sophisticated and complex interventions into critical illness?

Certainly one important component of basic medical care, that of adequate nutrition, has been anything but overlooked in critical care medicine. In fact, most modern ICUs have entire teams of physicians and nutritionists dedicated to assuring adequate nutritional support of these patients. Sleep and its related physiologic changes take up, on average, one third of an individual’s life. Moreover, many vital physiologic processes are defined in terms of a circadian rhythm and are thus intimately tied to the sleep state. Sleep is therefore also basic to human survival, and yet up to now it has assumed far less attention in the care of patients in the ICU.

An excellent review in this issue of CHEST (see page 1713) on sleep physiology in the setting of the ICU brings into focus the importance of sleep as an overlooked basic aspect in the care of the critically ill. Krachman and colleagues concisely summarize the normal physiology of sleep, document evidence showing that significant derangement of sleep is very prevalent among patients in the ICU, and detail many of the factors contributing to such sleep fragmentation and deprivation. This review should hopefully raise awareness of the profound disruption of sleep that likely occurs among many critically ill patients, as a function of both the ongoing acute illness as well as by the ICU environment itself. Such