severity of disease classification system. Crit Care Med 1985; **13:** 818–829.
9. Lemeshow S, Teres D, Avrunin JS, Gage RW. Refining intensive care unit outcome prediction by using changing probabilities of mortality. Crit Care Med 1988; **16:**470–477.
10. Zaren B, Hedstrand U. Quality of life among long-term survivors of intensive care. Crit Care Med 1987; **15:**743–747.
11. Zimmerman JE, Knaus WA, Judson JA, et al. Patient selection for intensive care: A comparison of New Zealand and United States hospitals. Crit Care Med 1988; **16:**318–326.
12. Donabedian A. Explorations in Quality Assessment and Monitoring. Vol I. Ann Arbor, Health Administration Press, 1980, pp 80–132.
13. APACHE III study design: analytic plan for evaluation of severity and outcome in intensive care unit patients. Crit Care Med 1989; **17:**S169–S221.
14. Cullen DJ, Civetta JM, Briggs BA, et al. Therapeutic intervention scoring system: a method for quantitative comparison of patient care. Crit Care Med 1974; **2:**57–60.
15. Kruse JA, Thill-Baharozian MC, Carlson RW. Comparison of clinical assessment with APACHE II for predicting mortality risk in patients admitted to a medical intensive care unit. JAMA 1988; **260:**1739–1742.
16. Knaus WA, Draper EA, Wagner DP, Zimmerman JE. An evaluation of outcome from intensive care in major medical centers. Ann Inten Med 1986; **104:**410–418.
17. Brewster AC, Karl in BG, Hyde LA, Jacobs CM, Bradbury RC, Chase YM. MEDISGRPS: a clinically based approach to classifying hospital patients at admission. Inquiry 1985; **22:**377–387.
18. Horn SD, Bulkley G, Sharkey PD, Chambers AF, Horn RA, Schramm CJ. Interhospital differences in severity of illness. Problems for prospective payment based on diagnosis-related groups (DRGs). N Engl J Med 1985; **313:**20–24.
19. Thibault GE. Evaluating intensive care unit outcomes. [In:] Parrillo JE, ed. Critical Decisions. Key issues in the recovery of the critically ill. Philadelphia, BC Decker, 1988, pp 57–76.
20. Jencks SF, Daley J, Draper D, Thomas N, Lenhart G, Walker J. Interpreting hospital mortality data. The role of clinical risk adjustment. JAMA 1988; **260:**3611–3616.
21. Le Gall JR, Loirat P, Alperovitch A, et al. A simplified acute physiology score for ICU patients. Crit Care Med 1984; **12:**975–977.
22. Keene AR, Cullen DJ. Therapeutic intervention scoring system: update 1983. Crit Care Med 1983; **11:**1–3.
23. Joint Commission on Accreditation of Health Care Organizations. Examples of monitoring and evaluation in special care units. Chicago, 1988, p 21.
24. Sivak ED, Gochberg JS, Fronek R, Scott D. Lessons to be learned from the design, development, and implementation of a computerized patient care management system for the intensive care unit. Proceedings of the 11th Annual Symposium on Computer Applications in Medical Care. Washington, DC, IEEE Press, 1987, pp 614–619.

Commentary

The development of medical technology in recent years has been explosive. Unfortunately, better technology does not necessarily equal better care; as a result, medicine has entered a new era of quality assessment and assurance.

Health care consumers and providers, third party payers, and society are asking: Is the care appropriate and, if so, is it delivered correctly? This question has particular relevance and importance in the intensive care unit (ICU). Standards of care are difficult to determine here, given the complexity of medical problems in this patient population, and the varied expectations of families struggling to cope with a loved one's critical illness.

In the ICU, perhaps more than in any other area of medicine, families are involved in the medical decision-making process. Should higher levels of technology be employed? Should the patient be resuscitated in the event of a cardiopulmonary arrest? Should support be withdrawn from the critically ill patient? Outcome data such as that presented by Sivak and Perez-Trepichio will permit health care consumers and providers to make better informed decisions when struggling with these questions.

On a societal level, health care spending cannot continue to increase indefinitely. The high cost of ICU care will ultimately restrict its use. ICU care will not be available to every patient with a life-threatening illness, nor will we be able to afford the indiscriminate use of high technology. A side benefit of ongoing quality assessment data collection should be the development of guidelines for the use of the ICU and its associated technology.

Sivak and Perez-Trepichio report their experience with a three-component data collection model consisting of structure, process, and outcome elements. Personnel and financial restraints limited their collection to structural elements (eg, admitting diagnosis) and outcome data (eg, mortality). The absence of a severity of illness assessment is a significant drawback and precludes comparison of their data with that from other institutions.

The model as outlined is a useful construct from which to develop an ongoing quality assessment program. Data from the process element (ie, what happens to the patient between his presentation to the ICU with an admitting diagnosis and his ultimate outcome) is awaited with interest. Does the use of varying levels of technology significantly alter the outcome in comparably ill patients?

In a setting where a randomized control trial may be difficult to perform, quality assessment data collection should provide critical insights into our use of the ICU and its technology. Only through careful analysis of data generated by such a model will we resolve the definition of "appropriate care" from the standpoint of the provider, the consumer, and society.

DAVID P. MEEKER, MD
Department of Pulmonary Disease