The Critical Care Crisis in the United States*

A Report From the Profession

Mark A. Kelley, MD, FCCP; Derek Angus, MD, MPH, FCCP; Donald B. Chalfin, MD, MS; Eduard D. Crandall, PhD, MD, FCCP; David Ingbar, MD, FCCP; Wanda Johanson, RN, MN; Justine Medina, RN, MS; Curtis N. Sessler, MD, FCCP; and Jeffery S. Vender, MD, FCCP

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Abbreviation: IT = information technology

The care of the critically ill patients accounts for 1% of the gross domestic product in the United States.1 The aging of the American population in the next 2 decades will increase the burden of acute and chronic illness and the demand for critical care services.2 The Leapfrog Group, a consortium of Fortune 500 companies, has identified critical care as a major factor in health-care quality.3 Leapfrog has promoted wider use of critical care physicians because such staffing improves patient outcome.4 These imperatives come at a time when the resources supporting critical care services are strained. Most alarming is the impending shortage of the critical care professional. Based on current practice, a shortfall of critical care physician specialists will occur within the next 10 years.2 If Leapfrog recommendations are implemented, the physician shortage will be immediate, highlighting the vulnerability of the system that also has a shortage of pharmacists and declining number of critical care nurses. This article describes these challenges and recommends steps to prevent a crisis in the delivery of critical care services.

Impending Crisis in Critical Care Delivery

The physician staffing of the ICU influences patient outcome. Staffing ICUs with physicians skilled in treating critical illness (“intensivists”) can reduce morbidity and mortality and the cost of care.5 Intensivists currently provide care to only 37% of all ICU patients in the United States.2

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*From the Department of Medicine (Dr. Kelley), Henry Ford Hospital, Detroit, MI; Department of Critical Care Medicine (Dr. Angus), University of Pittsburgh, Pittsburgh, PA; Department of Critical Care Medicine (Dr. Chalfin), Montefiore Medical Center, Brooklyn, NY; Keck School of Medicine (Dr. Crandall), University of Southern California, Los Angeles, CA; Department of Medicine (Dr. Ingbar), University of Minnesota, Minneapolis, MN; American Association of Critical-Care Nurses (Ms. Johanson and Ms. Medina), Aliso Viejo, CA; Division of Pulmonary and Critical Care Medicine (Dr. Sessler), Virginia Commonwealth University Health System, Richmond, VA; and Evanston Northwestern Healthcare (Dr. Vender), Evanston, IL. Manuscript received January 26, 2004; accepted January 28, 2004.

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Correspondence to: Mark A. Kelley, MD, Henry Ford Hospital, One Ford Place, 5B, Detroit, MI 48202; e-mail: Mkelley1@hfhs.org

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These trends strongly suggest that critically ill patients may not have access to health professionals qualified to treat them. This outcome presumes a status quo, whereby critical care practice remains unchanged and health professionals have no new incentives to enter critical care. To avert a crisis, policy makers and the profession must intervene to redesign critical care practice and improve the supply of its professionals.

**Redesigning Critical Care Practice**

*Common Standards*

In the United States, ICUs share many characteristics but the organization and delivery of ICU care are not standardized. Implementing evidence-based practice has considerable potential to promote efficiency and quality, both within ICUs and between them. The critical care professions, in collaboration with health-care purchasers and regulatory agencies, could lead this effort and implement standards of practice.

This is not a new idea. In 1991, the Society of Critical Care Medicine proposed guidelines for critical care practice, but they have not been widely adopted. This is an opportune time for the profession to develop a uniform approach to defining the level of care appropriate for the ICU, and standard protocols for common conditions. Another step is to regionalize critical care, similar to trauma. Pilot trials of regionalized critical care, especially in rural areas, could identify ways to optimize community resources to ensure quality.

The profession should also help the public confront the emotionally charged issue of end-of-life care. In contrast to other countries, ICUs in the United States are open to any patient, regardless of prognosis. While the critical care professions have developed policy positions on appropriate ICU care, patients and their families remain uncertain about the role of critical care services at the end of life. Consequently, ICU practice patterns at the end of life vary widely and can conflict with patient and family preference. As ICUs become constrained, the professions and the public should assure that these resources are consistently available to those patients who benefit from them.

*Using ICU Personnel More Effectively*

The efficiency of the current critical care workforce could improve if more was known about the effectiveness of critical care practice. For example, an ICU physician conducting daily rounds is associated with improved outcomes, but the cause and effect remain unclear. The optimal role of the critical care specialist on the ICU team needs to be defined. This role includes collaboration with other hospital-based physicians, such as hospitalists and emergency medicine specialists. Critical care nurses, pharmacists, and respiratory therapists are important for patient outcome and their roles might even be expanded beyond traditional boundaries. More research is needed to define the ICU multidisciplinary staffing that matches patient needs and optimizes patient outcomes.

An immediate priority is to create a practice environment attractive to health professionals, particularly critical care nurses and physicians. Standardizing practice with quality measures and evidence-based practice is an obvious starting point. These steps would eliminate considerable variability in ICU practice. Another action is implementing reliable patient acuity systems to allow flexible application of resources such as staffing, supplies, equipment, and ancillary support.

*Information Technology as an Instrument for Change*

Critical care practice requires rapid acquisition and organization of clinical information. Modern information technology (IT) systems could revolutionize critical care delivery by integrating real-time physiologic, laboratory, and imaging results with current medications and interventions. With such tools, adverse trends can be identified and trigger early, proactive intervention rather than delayed, reactive patient management.

Decision support can promote quality and efficiency by combining benchmark data and evidence-based management algorithms with individual patient data. Decision support can reduce adverse events, avoid drug interactions, and improve accurate drug selection. These systems can also set workflow priorities to increase efficiency. Such improvements could allow health-care professionals to treat a larger number of critically ill patients more safely and with less stress.

These technologies may have even greater potential when combined with telemedicine. Continuous remote intensivist staffing with video conferencing and computer-based data transmission may reduce ICU and hospital mortality, ICU complications, and ICU and hospital length of stay and costs. If supported by subsequent studies, the combination of informatics and telemedicine could promote more effective use of intensivists and promote quality, particularly in remote regions.

IT could alleviate critical care workforce shortages.
through greater efficiencies in synthesizing clinical data, identifying trends, and organizing workflow. However, there are some caveats. First, IT must be used to redesign patient care rather than to perpetuate the status quo. Second, the costs of IT are intimidating and, without relief, pose a barrier to widespread application.23

**Promoting Critical Care Professionals**

Critical care practice is attractive because of its exciting pace. However, considerable stress comes with treating severely ill patients. While little is known about “burn-out” of intensivists, these physicians may protect themselves from this outcome by their practice style. On average, intensivists spend only 25% of their time in the ICU.2 In contrast, > 70% of critical care nurses work in the ICU full-time.24 An important research question is how intensivists could be motivated to expand their ICU practice.

The future supply of intensivists is strongly linked to public policy that now seems indifferent to the impending critical care crisis. While private purchasers in the Leapfrog Group are demanding more intensivists, Medicare is threatening to cut reimbursement for professional services, including critical care. If implemented, this action will have serious long-term consequences. Incomes of intensivists are already lower than for some specialists with better lifestyles. Young physicians, burdened with educational debt, may find critical care financially less attractive as a career.

Even more threatening would be a reduction in Medicare support for graduate medical education. With predictions of a future physician workforce shortage,8 reducing graduate medical education funding hardly seems prudent. Policy makers must confront this physician workforce issue and use incentives, such as scholarships and loans, to attract more talent into vulnerable fields like critical care. Such steps have already been proposed for nurses.25

**Recommendations**

The future demand on critical care services in the United States will soon exceed the capabilities of current delivery system. The most alarming problem is the anticipated shortage of health-care professionals practicing critical care. The critical care professions must join policy makers to promote the following actions.

**Recommendation 1:** The critical care profession should adopt common standards to ensure uniformity, promote quality, and rationalize resources.

The action will require the collective wisdom and will of the profession and its societies. Developing standard approaches to ICU care, while controversial, will not be the most difficult part. The major challenge will be spreading these standards to every ICU in the nation. Success will depend on the unwavering determination by every critical care professional and hospital administrator to implement change.

**Recommendation 2:** Information technology should be leveraged in critical care to promote standardization and improve efficiency.

The federal government has identified medical informatics as a key factor in the future of healthcare delivery.23 Working with the profession and industry, the government should foster the development of a common ICU information platform with decision support. The action, coupled with a financially prudent implementation strategy, would improve quality and efficiency in critical care.

**Recommendation 3:** Policy makers should develop incentives to attract health-care professionals into critical care.

The federal government needs a more enlightened strategy to address the national projections of a physician shortage, especially in critical care. First steps are to ensure that payment for critical care services remains competitive and to provide financial and other incentives to promote the training of critical care professionals.

**Recommendation 4:** Policy makers should sponsor research that defines the optimum role for intensive care professionals in the delivery of critical care.

While evidence shows the importance of trained intensivists in critical care, current practice models range from full-time on-site intensivists to those practicing via telemedicine. Research should define how critically ill patients are best served by all health-care professionals and match patient needs with resources. These resources include location, technology and, most importantly, professional expertise.

Society has high expectations of modern medicine, especially in critical care. This expertise permits complex new therapies such as organ transplantation, responds to unexpected events such as epidem-
ics and terrorism, and guides chronically ill patients through life-threatening crises. As the population ages, the demands for such care will rise inexorably. Without intervention, the delivery of critical care services will suffer and, more importantly, so will our patients.

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