Critical Care Medicine Training and Certification for Emergency Physicians

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Demand for critical care services is increasing. Unless the supply of intensivists increases, critically ill patients will not have access to intensivists. Recent critical care society recommendations include increased graduate medical education support and expansion of the J-1 visa waiver program for foreign medical graduates. This article proposes additional recommendations, based on strengthening the relationship between emergency medicine and critical care medicine. Critical care is a continuum that includes out-of-hospital, emergency department (ED), and ICU care teams. Both emergency medicine and critical care medicine require expertise in treating life-threatening acute illness, with many critically ill patients often presenting first to the ED. Increased patient volumes and acuity have resulted in longer ED lengths of stay and more critical care delivery in the ED. However, the majority of critical care medicine fellowships do not accept emergency medicine residents, and those who do successfully complete a fellowship do not have access to a US certification examination in critical care medicine. Despite these barriers, interest in critical care medicine training among emergency physicians is increasing. Dual emergency medicine– and critical care medicine–trained physicians will not only help alleviate the intensivist shortage but also strengthen critical care delivery in the ED and facilitate coordination at the ED-ICU interface. We therefore propose that all accreditation bodies work cooperatively to create a route to critical care medicine certification for emergency physicians who complete a critical care fellowship. [Ann Emerg Med. 2005;46:217-223.]

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The goals of this article are to review the current and future factors affecting supply and demand for critical care, examine the relationship between emergency medicine and critical care medicine, explore how providing a pathway to critical care certification for emergency physicians who complete a critical care fellowship could improve the care of critically ill patients, and propose policy recommendations.
CRISIS IN CRITICAL CARE
The Demand for Critical Care Services is Increasing

Critical care is the delivery of medical care to “any patient who is physiologically unstable, requiring constant and minute-to-minute titration of therapy according to the evolution of the disease process.”1 This definition extends to any location such that critical care is defined physiologically rather than geographically. Recent evidence indicates an increase in the number of critically ill patients in the emergency department (ED) and ICU. In California EDs, Lambe et al2 reported a 59% increase in critically ill patients between 1990 and 1999. Nationally, 1 in 5 Americans receives ICU services before death,3 and critical care services account for approximately 0.56% of the gross domestic product of the United States.4 The increase in the number of critically ill patients has been attributed to increasing technologic demand, a higher prevalence of chronic medical conditions, and an increased incidence of sepsis.5 As the population of the United States ages, the incidence of critical illness will increase further, leading to greater demand for critical care services.5

An intensivist can be defined as an attending physician who, by virtue of training or experience, is consulted in the care of critically ill patients. The role includes assuming responsibility for some or all care of the patient and is more broad than that provided by consulting subspecialists.5 Based on the literature, there is a growing appreciation by stakeholders of the value provided by trained intensivists in the care of critically ill patients. A recent systematic review concluded that greater use of intensivists in the ICU led to significant reductions in mortality rate and length of stay.6 Financial models of intensivist coverage of ICUs suggest that significant hospital cost savings can also be achieved.2 The Leapfrog Group, a consortium of major private and public organizations that studies ways to improve health care, has advocated the use of an “intensivist model” of critical care delivery wherein all ICU patients are managed or comanaged by an intensivist. The intensivist should provide clinical care primarily in the ICU, be present during daytime hours, and be accessible by pager at all other times.8 The Society of Critical Care Medicine similarly envisions “a world in which all critically ill and injured persons receive care from integrated teams of dedicated experts directed by trained and present intensivist physicians.”9 This model is also supported by the National Quality Forum, a nonprofit organization created to develop and implement a national strategy for health care quality measurement and reporting.10

A Shortage of Intensivists Exists

Adoption of the intensivist model would require a large expansion of the critical care workforce because only about 1 in 3 ICU patients is currently treated by intensivists.5 Furthermore, because of aging of the population and an insufficient supply of trained intensivists, the demand for critical care is expected to outpace the supply of intensivists by 2007. This projected disparity is expected to markedly worsen over time.5 Recent workforce analyses similarly project a general overall physician shortage,11,12 suggesting that increases in the physician workforce and improvements in health care delivery are needed. Critical care is somewhat unique, however, in that societal demand by Leapfrog, National Quality Forum, and other stakeholders already exists. This demand increases the urgency of finding solutions to the current and projected shortage of trained intensivists. Recent data also suggest that interest in critical care medicine among internal medicine and anesthesiology residents is low,13,15 raising further concern about the future intensivist workforce. Unless the supply of intensivists increases, many critically ill patients in the United States will not have access to intensivists. This shortage has been called a “crisis” in health care and identified as a threat to public health.16–18

What Can Be Done?

In 2004, 4 major critical care societies in the United States, the American College of Chest Physicians, American Thoracic Society, Society of Critical Care Medicine, and the American Association of Critical Care Nurses, published a white paper with their recommendations for alleviating the critical care manpower shortage (FOCCUS, Framing Options for Critical Care in the United States).17 These recommendations included increased graduate medical education support for critical care specialty training, expansion of the J-1 visa waiver program for foreign medical graduates trained in critical care, and that “policy makers develop incentives to attract healthcare professionals into critical care.”18 Another potential solution would be to expand access to subspecialty training and certification in critical care to emergency physicians, an essentially untapped resource.

EMERGENCY MEDICINE AND CRITICAL CARE MEDICINE
Similarities Between the Specialties

Critical illness develops well before ICU admission, and critically ill patients often present first to the ED. The late Dr. Peter Safar noted that critical care is a continuum that begins with out-of-hospital care, continues with ED intervention, and culminates in ICU admission and management.19 Emergency medicine and critical care medicine require knowledge and expertise in treating life-threatening acute illness, with emergency medicine focused on the early hours of disease presentation and critical care medicine weighted more toward prolonged management within the ICU. In the Society of Critical Care Medicine’s first year of existence, Dr. Safar’s vision led to the formation of a Federation of Societies of Emergency and Critical Care Medicine, a formal alliance with the American College of Emergency Physicians (ACEP) and the University Association of Emergency Medical Services.19 Since then, the 2 specialties have diverged in the United States. Internationally, they remain more closely linked. Some of the world’s oldest and largest critical care meetings are, and have always been, joint emergency medicine and critical care medicine conferences.20,21
Emergency medicine residency training provides a strong foundation for pursuing fellowship training in critical care medicine. The Core Content of Emergency Medicine encompasses the emergency management of medical and surgical conditions. This curriculum is highly consistent with the American College of Critical Care Medicine’s guidelines for critical care medicine training. Emergency medicine residents have extensive experience in the early recognition and management of critically ill patients, from the out-of-hospital setting through to ICU admission. Emergency medicine residencies provide ample training in many critical care procedures, including airway management, central venous access, tube thoracostomy, and resuscitation of hemodynamically unstable patients. Each emergency medicine resident must perform at least 80 adult resuscitations, 35 intubations, and many other procedures common to the ED and ICU. The emergency medicine Residency Review Committee also requires a 2-month minimum of formal ICU experience, as well as training in the management of critically injured trauma patients. As such, emergency medicine residency graduates are well prepared to enter a critical care medicine fellowship.

Besides training, other similarities exist. Emergency physicians and critical care medicine physicians are hospital-based generalists who practice in a specialized environment, use similar procedures, and emphasize the acute care of critically ill or injured patients. In fact, emergency physicians routinely provide critical care in the ED and in many hospitals are responsible for managing all inhospital cardiac arrests, emergency intubations, and other medical crises. In the 2002 US National Hospital Ambulatory Medical Care Survey, 1% of all ED patients needed immediate attention (eg, were unconscious or required resuscitation), 22% were classified at triage as emergency (should be treated within 15 minutes), and more than 1.4 million patients were admitted to an ICU through an ED. The average wait time before transfer from the ED to an ICU in the 2001 survey was slightly longer than 4 hours. During this crucial period, critical care provided in the ED includes emergency resuscitation and lifesaving procedures before transfer to an ICU.

Several US single-center studies have also documented the extent of critical care delivery in EDs. Fromm et al reported that during a 1-year study period in a teaching hospital, 154 patient-days of ED critical care were provided, with ED lengths of stay for these patients of up to 11 hours. Nguyen et al estimated that 464 patient-days of critical care were provided annually in a large urban teaching hospital’s ED. Similarly, Nelson et al examined the amount of critical care provided in their hospital’s ED and ICUs during a 3-month period and found that 15% of all critical care was performed in the ED. Varon et al and Svenson et al reported that critically ill patients spent several hours in their EDs before transfer to an ICU and that critical care procedures were commonly performed in their EDs.

Emergency medicine and critical care medicine also have a number of differences. First, the 2 specialties are geographically separated by tradition and training: emergency medicine is based in the ED, whereas critical care medicine is based in the ICU. Second, the ED treats the entire spectrum of disease, from minor injuries to critical illness, whereas the ICU focuses solely on critical illness. As such, a major priority for emergency physicians is to identify truly critically ill patients within the general ED population. For ICU-based physicians, this differentiation has already been made. Last, emergency medicine training focuses mainly on detection and resuscitation of critically ill patients but lacks the long-term perspective of critical care medicine training, including weaning from mechanical ventilation, nutrition, and other more chronic aspects of ICU management.

**Limited Access to Critical Care Training for Emergency Medicine Residents**

Despite significant overlap in training, the frequent provision of critical care in the ED, and the need for more critical care medicine practitioners in the United States, few emergency physicians have entered critical care medicine. Unpublished surveys conducted by the authors have identified only 55 dually trained emergency medicine and critical care medicine physicians in the United States. Many of these physicians practice emergency and critical care medicine in academic and community settings. This number would likely increase if the barriers to critical care medicine training were removed. These barriers include limited access to critical care medicine fellowships and the absence of a formal certification pathway in critical care medicine for emergency physicians who complete a critical care medicine fellowship. Only 38.6% of all adult nonpulmonary critical care medicine training programs listed in the American College of Graduate Medical Education “Green Book” are willing to consider applications from emergency medicine–trained physicians. This percentage has remained static since 1995. Critical care medicine fellowship program directors cite the lack of emergency medicine–specific pathways to formal critical care certification and resultant concerns of criticism from their residency review committee as major barriers to accepting emergency physicians into their programs.

A recent proposal by the American Board of Internal Medicine may inadvertently reduce this percentage even farther. Previously, the American Board of Internal Medicine allowed up to 25% of the fellows in an internal medicine–based fellowship to be from a non–internal medicine residency. This allowance does not decrease the total number of slots available to interested internal medicine candidates but enables programs to fill slots that may have otherwise been left empty. This rule has benefited emergency physicians by allowing access to critical care medicine training that would not otherwise have been available. The American Board of Internal Medicine recently proposed limiting all internal medicine–based fellowships exclusively to internal medicine residency graduates. Under this proposed new rule, only geriatric fellowships would be excluded; family medicine residents would still be allowed to train in this subspecialty. This proposal would have the unfortunate
effect of excluding emergency medicine–trained physicians from entering internal medicine–based critical care medicine programs, even if the program director thought otherwise.

**Lack of a Formal Critical Care Certification Pathway**

Even when emergency physicians obtain postgraduate critical care medicine training, there is no formal certification pathway available to them in the United States. The original vision of Society of Critical Care Medicine’s founders was of a multidisciplinary organization with a single certifying process for all physicians who had completed critical care medicine training and were able to demonstrate competence in the practice of critical care medicine. This concept of a unified body of critical care medicine practitioners fragmented into multiple specialty groups, each administering its own certificate of added qualification. Currently, the most common pathways to adult critical care medicine in the United States are internal medicine and pulmonary medicine, surgery, and anesthesiology. In 1985, the American Board of Obstetrics and Gynecology was also authorized by the American Board of Medical Specialties to issue certificates of added qualification in critical care to its diplomates who completed a critical care medicine fellowship and passed either the American Board of Anesthesiology or American Board of Surgery critical care examination. In 1991, the American Board of Anesthesiology was willing to open its critical care medicine examination to emergency physicians, who completed a critical care medicine fellowship. However, the proposal never gained final approval from the American Board of Medical Specialties.

For more than 2 decades, the American Board of Emergency Medicine (ABEM) has tried to obtain American Board of Medical Specialties (ABMS) certification for emergency physicians who completed an accredited critical care medicine fellowship. In 1982, Dr. David K. Wagner, then President of ABEM, wrote “ABMS has suggested that ABEM enter into discussions with the Committee on Critical Care Medicine to develop the means to certify our qualifying diplomates. It is reasonable to hope that a process will be negotiated in the near future.” In 2003, ABEM revisited this issue but was unsuccessful in obtaining ABMS approval. In contrast, the Leapfrog Group’s definition of an intensivist includes board-certified emergency physicians who have completed a critical care medicine fellowship in an American College of Graduate Medical Education–accredited program.

Without access to US certification, some emergency and critical care medicine physicians have taken the European Diploma in Intensive Care examination, which is open to physicians who have completed a residency in anesthesiology, internal medicine, surgery, pediatrics, or emergency medicine, plus 2 years of additional critical care medicine training. This exam is sponsored by the European Society of Intensive Care Medicine, a professional organization of European intensive care (critical care) practitioners.

The primary reason for the lack of a formal critical care medicine certification pathway for emergency physicians appears to be due to a decades-old agreement made between ABEM and representatives of other specialties (B. Munger, former Executive Director of ABEM, oral communication, March 2005). ABEM gained primary ABMS specialty board status in 1989 only after years of negotiation and in agreement with the concept that emergency medicine was not an “inhospital” specialty. Turf battles are not uncommon in medicine and have been reported in cardiology, psychiatry, and other specialties. More than a decade ago, the ACEP Critical Care Committee noted that for emergency medicine, “potential disadvantages to the pursuit of such advanced [critical care medicine] training and certification mechanisms include the political ‘backlash’ likely to come from other specialties and the negative effects that such turf wars can have.” Although turf issues are significant and play a role in medicine, meeting the needs of the growing burden of critical illness must take precedence. Therefore, although this agreement may have been appropriate for its time, in 2005, patients may be better served by a reevaluation of this agreement.

**DUAL-TRAINED EMERGENCY MEDICINE AND CRITICAL CARE MEDICINE PHYSICIANS: A POSSIBLE SOLUTION**

We believe that the provision of adequate avenues for critical care medicine training and certification of emergency physicians would encourage more emergency physicians to enter critical care medicine, thereby decreasing the intensivist shortage, facilitating critical care delivery in the ED, enhancing the ED-ICU interface, and ultimately improving care of the critically ill patient.

**Pool of Potential Intensivist Manpower**

Despite the barriers noted above, there is growing interest in critical care medicine among emergency physicians. The Society of Critical Care Medicine’s emergency medicine section has seen active participation at the national meeting increase by more than 200% in the past 4 years, with a current total roster of 299 members. ACEP’s critical care medicine section had the highest membership growth of all ACEP sections for the past two years and has a current roster of 285 members. The Society for Academic Emergency Medicine recently formed a critical care taskforce to examine issues of critical care medicine training and practice for emergency physicians.

Emergency medicine residents have also expressed increased interest in critical care medicine such that in 2002, the Emergency Medicine Residents Association formed a Critical Care Committee for emergency medicine residents. This committee has more than doubled in size since its formation and is conducting a survey of emergency medicine residents about critical care medicine. Preliminary results suggest that provision of a pathway to formal critical care medicine certification would greatly increase interest in critical care medicine.
fellowships and that emergency medicine residents believe that a dual trained emergency medicine and critical care medicine physician would be of value to their training. \textsuperscript{51} There has also been a steady increase in the number of emergency medicine residents applying to critical care medicine fellowship programs. Applications at the critical care medicine fellowship programs at the University of Pittsburgh and the R. Adams Cowley Shock Trauma Center at the University of Maryland have significantly increased during the past 5 years (L. A. Fabiszewski, personal communication, November 2004; T. M. Scalea, personal communication, November 2004). These data point to a ready pool of highly motivated individuals interested in critical care medicine, despite the existing obstacles for emergency physicians.

Certain limitations exist. As with any specialty, emergency medicine residents bring particular strengths and weaknesses to their fellowship. For example, although likely having more experience with procedures and resuscitation than internal medicine residents, emergency medicine residents, like anesthesiology residents, will usually have less exposure to the prolonged management of hospitalized patients. Emergency medicine residents may benefit from taking additional ICU or ward elective months. It is likely that emergency medicine residents interested in pursuing a critical care medicine fellowship training actively seek out this additional exposure before fellowship. However, a more formal examination of requirements for longitudinal inpatient exposure may improve preparation for a critical care medicine fellowship. Last, some evidence suggests that there is also a shortage of emergency physicians. \textsuperscript{52} Emergency medicine residents who complete critical care medicine training may split their time between the ED and ICU or practice full time in the ICU, potentially decreasing the emergency physician workforce.

Additional Benefits of a Dual Emergency Medicine–Critical Care Medicine Physician Workforce

Crowding in the ED has become a major problem in the United States. \textsuperscript{53} Nationally, ED visits have increased 20\% in the last 10 years, even as the number of EDs has decreased and patient acuity has increased. \textsuperscript{2,26} In the United States, the most common reason for ED crowding and for ED “diversion” (wherein an ED is forced to turn away ambulances because of their hospital’s lack of capacity) is a lack of ICU beds. This has resulted in ICU patients being boarded in EDs for many hours or even days. These initial hours of ED intervention are crucial in treating critical illness. More than 30 years ago, Dr. Peter Safar noted the importance of early intervention for critically ill patients, stating that “the most sophisticated intensive care often becomes unnecessarily expensive terminal care when the pre-ICU system fails.” \textsuperscript{19,55} This concept has been validated in the care of victims of trauma, \textsuperscript{56} ischemic stroke, \textsuperscript{57} acute myocardial infarction, \textsuperscript{58} cardiac arrest, \textsuperscript{59,60} and severe sepsis and septic shock. \textsuperscript{61}

Emergency physicians with additional critical care medicine training would provide critical care expertise in crowded EDs, facilitating earlier delivery of critical care and potentially reducing morbidity, mortality, and cost. \textsuperscript{62} Such physicians would also be ideally suited to improve coordination between the ED and ICU. As demonstrated with other fellowships available to emergency physicians such as toxicology and pediatric emergency medicine, fellowship-trained emergency physicians enhance ED care, system implementation, and education in their specific area of expertise. As such, alleviation of the intensivist workforce shortage would be only 1 of several ways that dual-trained emergency and critical care medicine physicians could improve the care of the critically ill.

Another area in which emergency and critical care medicine physicians could be of particular benefit is in underserved hospitals where obtaining 24-hour-per-day ICU coverage may be difficult. Hospitals with small ICUs have difficulty in attracting and funding trained intensivists, mostly because of a lack of patient volume. However, many of these hospitals still desire continuous availability of a physician adept at critical care medicine. In these hospitals, ICU coverage by an emergency and critical care medicine physician might provide significant economy of scale by providing ED and ICU coverage. Last, development of critical care research initiatives as applied to the ED-ICU interface would be a natural area of focus and has already yielded results. \textsuperscript{30,61,63,64}

Emergency Medicine/Critical Care Medicine at the University of Pittsburgh: A 30-Year Experience

Although the concept of emergency physicians training in and practicing critical care medicine may seem novel, the hypothesis has already been tested at the University of Pittsburgh Department of Critical Care Medicine’s Multidisciplinary Critical Care Training Program. \textsuperscript{65} The Multidisciplinary Critical Care Training Program was founded in 1963 by Dr. Peter Safar and directed by Dr. Ake Grenvik for 25 years. These 2 pioneers made the program available to physicians of any critical care medicine–related specialty, including emergency medicine, with the first emergency physician serving as a critical care medicine fellow in 1976. Currently, the Multidisciplinary Critical Care Training Program has 4 emergency medicine–trained intensivists on its faculty. During the past 30 years, many emergency medicine–trained physicians have graduated from the Multidisciplinary Critical Care Training Program, and have gone on to successful emergency medicine and critical care medicine clinical, research, and administrative careers, including several of this article’s authors (DTH, KJG, SRG, EK, EPR). Other critical care medicine fellowships have a long tradition of accepting emergency medicine–trained residents, particularly the R. Adams Cowley Shock Trauma Center at the University of Maryland. \textsuperscript{74} This program’s history has been so successful that it annually reserves 3 fellowship positions for emergency physicians.

CONCLUSIONS

The number of critically ill patients continues to increase, creating a crisis in critical care with a shortage of trained intensivists. Many similarities exist between critical care and emergency medicine, despite differences in length and
chronicity of patient care. Emergency physicians who complete a critical care fellowship would help alleviate the intensivist shortage, provide critical care expertise in the ED, and improve the ED-ICU interface. Improving access to critical care fellowships and providing a pathway for certification would likely encourage more emergency physicians to pursue critical care training.

Proposed Recommendations
1. Emergency physicians should have access to formal critical care medicine training and certification in the United States. These physicians should be active participants in future critical care training and certification initiatives.
2. All accreditation bodies should work cooperatively toward the common goal of improved quality and access to care by increasing the number of qualified intensivists available to the critically ill and injured. These organizations should create a route to formal critical care medicine certification for emergency physicians who complete a critical care fellowship. Examination of requirements for longitudinal inpatient exposure may improve preparation for critical care fellowship training.

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“Current politics preventing emergency medicine from giving additional critical care medicine subspecialty certification is wrong.”

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