

Status of trauma and acute care surgery in the United States

Birleşik Devletler’de travma ve acil cerrahinin durumu

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Acute Care Surgery (ACS) is an evolving specialty. The components, as defined by the American Association for the Surgery of Trauma are trauma, surgical critical care and emergency surgery. As documented by the recent reports from the Institute of Medicine, the shortage of surgical specialists who make themselves available for emergency care in the United States, the overcrowding of emergency departments and lack of surge capacity are reaching crisis conditions. The Institute of Medicine has recommended the development of regional centers of surgical specialists, analogous to trauma systems. The training of surgeons in ACS will address the manpower issue to some degree.

Key Words: Acute care surgery; attitude of health personnel; surgery/education; traumatology/manpower; United States.

Acil cerrahi gelişmekte olan bir alandır. Ögeleri, Amerikan Travma Cerrahisi Derneği tarafından tanımlandığı şekilde travma, cerrahi yoğun bakım ve acil cerrahidir. *The Institute of Medicine* (Tıp Enstitüsü) kaynaklı yeni yayınlarda bildirildiği gibi, Birleşik Devletler’de acil alanında çalışan cerrahi uzmanlarının sayıca azalması, acil bölümlerin aşırı kalabalıklaşması ve hasta kapasitesinin karşılanamaması durumları kriz derecesine ulaşmıştır. *The Institute of Medicine* cerrahi uzmanların çalıştığı ve travma sistemlerine benzeyen bölgesel merkezler önermiştir. Cerrahların acil cerrahi alanında eğitim almaları işgücü sorununa bir oranda çözüm olacaktır.

Anahtar Sözcükler: Akut cerrahi; Birleşik Devletler; cerrahi/eğitim; sağlık çalışan tutumu; travmatoloji/insan gücü.

Why has the specialty of *Acute Care Surgery* evolved? Why is there this new concept? Over the decade of the 1980s, trauma surgery became a specialty. There was an increase in penetrating trauma and frequent operations for blunt trauma. Thus, at busy trauma centers, there was sufficient volume to keep the trauma surgeons busy. However, over the past 15 years, the incidence of penetrating trauma has declined in the United States. Most abdominal organs injured following blunt trauma, specifically the spleen and liver, are observed without operation now. Except for busy trauma centers in the more violent cities in the United States, trauma surgeons don’t operate as much as they did in the past. Thus, there is the risk of them losing their skills.^[1-4] More importantly, *Acute Care Surgery* has evolved because of the need. Surgeons have become progressively

more specialized. What was once known as a “general surgeon” is a dying breed. The majority of residents entering academic surgery now are “boutique” surgeons. They specialize in vascular surgery, breast surgery, endocrine surgery, GI surgery, or bariatric surgery. Thus, there is a large unfilled need for general surgeons across the United States. This concept is corroborated by the reports over the summer from the Institute of Medicine on the Future of Emergency Care in the United States health system.^[5-7] This was published in 3 documents: At the breaking point (hospital emergency care); Emergency medical services at the crossroads (prehospital care); and Emergency care for children: growing pains. In summary, there are insufficient surgeons to cover the need in the United States; and this shortage is predicted to become more profound. Two-

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thirds of emergency departments in the United States do not have subspecialty coverage. There are 115 million ED visits per year in the United States. Forty-five percent of hospital admissions currently come from the Emergency Department. Since 2003, the United States spent more health care dollars on injury than any other disease. Ironically, trauma receives the least funding from the government as far as research and system development.

The Emergency Institute of Medicine document on hospital-based emergency care, reported that 40% of hospitals report emergency department over crowding on a daily basis.^[5] Patients may wait as long as 48 hours for an in-patient bed. In the United States, there are 500,000 ambulance diversions per year. Uncompensated care in the United States results in financial losses and closures for emergency departments and trauma centers. As mentioned, there is unavailability of on-call specialists to provide emergency and trauma consultation. This basically involves all of the surgical specialties. In addition, despite the presumed emphasis on disasters, there is inadequate emergency preparedness. We do not have adequate surge capacity, training, planning or personal protective gear. The solution proposed by the Institute of Medicine for this problem is regionalization of on-call specialty services with the development of Acute Care Surgical Hospitals, analogous to the development of trauma systems.

The document from the Institute of Medicine and Emergency Medical Services confirmed lack of coordination between local service providers; between EMS and public safety; between EMS and air medical services.^[8] As far as disaster preparedness, the report documented inadequate training, equipment, and funding.

As far as emergency care for children, they are frequently essentially forgotten in the development of disaster plans.^[9] Only 6% of emergency departments have essential pediatric supplies and equipment needed to manage pediatric emergencies. Many emergency providers receive little training in pediatric emergency care. As mentioned, disaster preparedness plans largely overlook the needs of children.

What is *Acute Care Surgery*? The three major components of *Acute Care Surgery* are: trauma, surgical critical care, and emergency surgery. The

curriculum for *Acute Care Surgery* has been developed by the American Association for the Surgery of Trauma.^[10] This will be discussed in detail later in the paper.

One other important reason for the development of *Acute Care Surgery* is to make it more appealing for surgical residents as a career. The need cannot be met if we do not attract residents to the specialty. A landmark paper written by Dave Richardson and Frank Miller in 1992, reported on a survey sent to 1,795 PGY III, IV, and V residents.^[11] Eight hundred and eighty-six residents responded. Two-thirds of the residents thought that trauma was a rewarding field. However, only 18% of the residents wanted trauma as a career or a major part of their practice. The corollary is that 82% of residents in 1992 wanted nothing to do with trauma in their practices. It is predictable that this problem is even worse at the current time. Only 6 comments were written by the residents in the positive comment/rating part of the survey. These included: trauma is exciting and challenging; it is our duty to care for injured patients; they had a strong emphasis on trauma training; the residents had an academic trauma interest; trauma provided cases as ones practice grows; and even in this section, some residents stated they were not interested in trauma for any reason. One hundred and two residents wrote 430 negative comments. Specifically, they thought there was a lot of work with few operations, particularly for blunt trauma. Lifestyle issues included too much work and negative economic factors. There was concern of litigation. Most bothersome from this report was that trauma surgeons were viewed as poor role models. They were seen as non-operative surgeons, did not perform elective surgery, and were not really part of general surgery. Another paper which addressed the future of the trauma surgeon was presented in 2001.^[12] From 1985 to 1999, 16,800 trauma patients were admitted to the trauma center at University of California at San Diego. The injury severity scores for these patients declined from an average of 16 to 10.7, the frequency of penetrating injuries declined, and the percentage of patients with major head, chest and abdominal injuries declined as well. As a result, the number of craniotomies, thoracotomies and laparotomies declined significantly.

Again, the issue arises that most “general surgeons” at academic hospitals are now “boutique” sur-

geons.^[2,3,8,9] They perform limited scope of operations, often only during daylight hours. Many of these surgeons state that they are not competent to do emergency general surgery. Certainly after decades of practice, this is probably true for them. Thus, the United States has the difficulty of insufficient surgeons and surgical specialists to cover emergencies in all hospitals. Thus, the field of *Acute Care Surgery* has been proposed. The curriculum is 2 years long.^[10] One year is essentially surgical critical care as defined by the American Board of Surgery. Nine months must be spent in the intensive care unit, with 3 months on elective rotations. The second year of *Acute Care Surgery* curriculum involves emergency and elective general surgery. Suggested rotations during emergency surgery and elective rotations are 4-6 months on the acute care surgery service, 1-3 months on thoracic surgery, 1-3 months on transplant/hepatobiliary surgery, 1-3 months on vascular surgery, and 1-3 months on electives. Thus, 9 months are spent in the intensive care units and 15 months on operative rotations. The curriculum has been designed for all systems. One of the difficulties with the curriculum is that it addresses only emergency operations. I am concerned that in order to be a competent emergency surgeon, one needs to be a busy elective surgeon as well. It is naïve to think that to perform the difficult operation for acute cholecystitis, one will be a master without doing a large volume of elective biliary surgery as well.

A presentation at the recent American Association for the Surgery of Trauma Meeting with Gene Moore and Dave Hoyt as authors, was entitled, "The Trauma Surgeons Current Practice: Can We Deliver Acute Care Surgery".^[12] A survey was sent to the directors of 1,288 designated trauma centers in the United States. The response rate was 72% overall. Response was 92% from Level 1 centers, 72% from Level 2 centers, 59% from Level 3 centers. Of the 169 Level 1 centers, only 18% reported that their surgeons performed the entire spectrum of abdominal, thoracic and vascular cases. Level 2 trauma centers reported that 6% of the surgeons performed the full spectrum of cases and Level 3 centers reported 4%. Thus, at 82% of the trauma centers, the trauma surgeons needed thoracic and vascular surgeons to help manage the trauma cases. Thus, the model for *Acute Care Surgery* is attractive, but can we realistically do this?

A poster presentation at the AAST from the University of Pennsylvania addressed "Training Acute Care Surgery Fellows in Major Vascular Trauma".^[13] This was a report over a 6 year period from an urban trauma center in Philadelphia. There were 16,000 trauma contacts with 136 vascular injuries. Only 64 major vascular injuries were reported over the 6 year period. Forty injuries were repaired by the trauma service alone, 24 injuries required the combined services of the trauma and vascular services. Thus, the question of how can we possibly teach acute care surgeons to competently treat vascular injuries when they are infrequent, even in our busy trauma centers. The curriculum is relatively straight-forward, however, implementation of it is difficult. How do we have a meaningful experience with the fellows on vascular, hepatobiliary, or thoracic services?

Importantly, the actual practice of Acute Care Surgery will be an institution-specific phenomenon. Even within the City of Pittsburgh, the practices of the trauma surgeons at the 3 Level 1 trauma centers are dramatically different. At one hospital, the trauma surgeons practice critical care, trauma, and burns only. At another, the trauma surgeons practice emergency surgery as well. At UPMC Presbyterian, we have performed all components of *Acute Care Surgery*, as well as busy elective general surgery practices for 25 years.

For *Acute Care Surgery* to be a sustainable and attractive field, there are several necessary components: 1) The practice must be sustainable for the long term; job satisfaction, lifestyle, and financial compensation. 2) The specialty must be respected by our surgical and medical peers. 3) We cannot be "jacks of all trades and masters of nothing". We must first be competent general surgeons. 4) The specialty must be attractive to residents. 5) The specialty must be fairly compensated financially. 6) The lifestyle must be sustainable. There must be a large enough critical mass of partners, that the hours are manageable.

As mentioned, there are many trauma services in the United States that have been practicing *Acute Care Surgery* for decades. Another important concept is the idea of the acute care surgery service and the acute care surgery hospital being the "safety net" for critically ill patients in the region. The University of Pittsburgh Medical Center in Pittsburgh

is a 20 hospital system with 3.000 in-patient beds. UPMC Presbyterian/Montefiore is the “mother ship” of the health system. UPMC Presbyterian/Montefiore has 715 adult beds, 155 intensive care unit beds, and 43 operating rooms. The acute care surgery/trauma service admitted 4.100 trauma patients and 2.000 general surgery patients last year. We average 30 operative cases per week and an in-patient service from 70-105 patients. Again, I believe the essential components to the service are trauma, critical care, all emergency general surgery for the institution; as well as elective general surgery. I do believe that the elective surgery is an important component of the specialty. As recommended by the Institute of Medicine, the need for *Acute Care Surgery* exists and developing the specialty is a goal for which we should all strive.

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