

Career Resources

Trauma/critical care surgery

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Acute care emergency
surgery;
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Prevention

Abstract. The specialty of trauma/critical care is relatively new and is currently in a state of evolution as we now face not only a shortage of surgeons but also an alarmingly increasing number of well-trained surgeons who are unwilling to provide emergency care. Regionalization of both trauma and emergency surgical care nationwide is on the horizon and will require major changes in our surgical training programs. However, careers in trauma/critical care and emergency surgery can offer a controlled lifestyle, challenging cases that cross over many disciplines, and a rich field for scientific investigation.

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For many years, advances in the care of the injured patient were tightly linked to military conflicts. Indeed, the current military actions in Iraq and Afghanistan have resulted in a number of important changes in how trauma patients are managed.¹ For the most part, however, injuries resulting from trauma were considered “accidental” and therefore not a “disease” per se. Even today, most people do not realize that injury is the number 1 public health problem in our country, with a price tag of over \$260 billion annually.² Fortunately, civilian trauma care in the United States changed dramatically in 1973 with the passage of the Emergency Medical Services Systems Act, which provided guidelines and financial assistance for developing emergency medical services systems.³ These new emergency systems delivered the critically ill and injured patients to large hospitals with the equipment and services needed to care for them. Inner-city public and academic institutions (eg, Cook County Hospital, Chicago, IL; Grady Memorial Hospital, Atlanta, GA; Bellevue Hospital, New York, NY; and San Francisco General Hospital, San Francisco, CA) became de facto “trauma centers.” Parallel to these developments, the American College of Surgeons published standards for the “Resources for Optimal Care of the Injured Patient,” which greatly facilitated the verification and designation of trauma centers in many locations.⁴ A recent study by Mackenzie et al⁵ showed conclusively that the mortality rate for patients treated in a trauma center is significantly lower than those at nontrauma centers. Although these results should prompt continued development

of a nationwide system of trauma and emergency care ensuring that everyone has access to the level of treatment based on their need, the 2007 Institute of Medicine Report suggests that hospital-based emergency care in our country is at the breaking point.⁶ Our field and particularly our patients are in need of energetic young surgeons with the proper training to care for emergency general surgical conditions, traumatic injuries, and surgical critical care who are committed to being available 24/7 during their scheduled coverage days and who have an interest in advancing the science of injury/emergency surgical care and prevention.

Training Requirements

Residency

The completion of a general surgery residency is the minimal requirement for working as a trauma surgeon. However, both academic and nonacademic trauma surgeons are now opting for at least 1 year of postgraduate training, primarily in critical care. When choosing a general surgery residency, a student interested in trauma should select a program that includes a broad exposure to organized trauma care including emergency department training, trauma surgical training, and rotations in orthopedic, neurologic, and urologic surgery as well as surgical critical care.

Fellowship training

Because trauma surgeons must be competent in surgical critical care, a year of critical care fellowship is essential. Critical care boards cannot be obtained without at least 1

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year of critical care training, and there are restrictions on the number of hours spent during that year that can be used for trauma surgical call (3 months on the trauma service). At the end of a 1-year critical care fellowship and provided that the candidate has already passed general surgical boards, the fellow can sit for the Special Competency examination for Surgical Critical Care through the American Board of Surgery. The listing of approved trauma/critical care fellowships can be found on the web site of the American Association for the Surgery of Trauma (<http://www.aast.org>).

Trauma fellowship

Many programs offer a 2-year fellowship, one to fulfill the critical care training and the second for added experience in trauma surgery. (There is currently no separate board for trauma surgery itself). Trauma fellowships are designed to allow the trainee to learn about the various components of running an organized trauma service (ie, trauma registry and trauma performance improvement) and to spend time as a junior attending under the guidance of an experienced trauma surgeon. A complete list of RRC-approved critical care fellowships can be obtained at the web site of the American Association for the Surgery of Trauma (AAST).¹ Trauma fellowship and trauma research opportunities are also listed on that web site.

Acute care surgery

A new paradigm for surgical training is emerging even as this paper is being written. The concept was designed to ensure that, as general surgery has become increasingly specialized and fragmented, the acute care surgical fellowship will provide broad training for surgeon in surgical emergencies, trauma care, and critical care. The curriculum has been finalized, and 3 institutions to date have undergone a successful site visit with several now pending. An example of such a curriculum can be viewed in the newly published book *Acute Care Surgery: Principles and Practice*.⁷ Once again, there has been no decision to date on whether or not this new curriculum will be "certified" by the American Board of Surgery.

Board certification

As mentioned previously, there are no specific boards for trauma surgery itself. After completion of general surgical boards, a critical care fellowship is recommended so that specialty boards in surgical critical care can be obtained.

Grant Funding, Research Fellowships, and Travel Fellowships

Medical students

Unfortunately, there is little trauma care education for medical students. The basic principles of trauma care for

medical students can be assessed via the TEAM Course, which is offered by the American College of Surgeons Committee on Trauma. Some students are exposed to trauma on rotations in busy trauma hospitals with a trauma surgeon as a preceptor. Fourth-year medical students interested in trauma will often seek out these positions by rotating to another program. Trauma research positions do exist for premedical students at various academic institutions, but there is no central repository containing this information. Even more tragic, medical students are taught almost nothing about injury prevention and control, although there is a move to change the curriculum to accommodate this deficiency. The AAST encourages medical students to attend their annual scientific meeting, and selected students will have their expenses covered. Another interesting development is the recent interest displayed by medical students in global health.⁸ As injury represents a major health care burden in developing countries, many more medical students have taken an interest in the field of trauma.

Residents

Residents who wish to pursue careers in trauma surgery should seek out research positions from 1 of the 10 National Institutes of Health centers that have trauma training grants. These grants are designed for residents who wish to pursue an academic trauma career and are usually for 2 years during midresidency. Both basic and clinical research is included at most centers. The National Institutes of Health trauma training centers are listed on the AAST web site (<http://www.aast.org>).

Faculty

Funds for research at the faculty level in trauma are very limited. The AAST funds several trauma research fellows per year at the junior faculty level. The National Institutes of Health funds some basic laboratory work of interest to trauma/critical care surgeons but very little in the area of clinical work. However, the Center for Disease Control for Research and Prevention funds 11 Centers of Excellence in Trauma Care and Injury Prevention. Additional funds for injury and violence prevention projects for individuals are also available from the Center for Disease Control (<http://www.CDC.gov>).

Membership in Societies

The American College of Surgeons Committee on Trauma

Members and associate members of the American College of Surgeons (FACS) can join their local chapter's committee on trauma. By working with the National Com-

mittee on Trauma, the local committees on trauma assist with designation of trauma centers, organizing trauma systems, education of trauma professionals (including sponsoring the Advanced Trauma Life Support Course), advocating for trauma legislation, and injury prevention activities (<http://www.facs.org>; trauma).

The American Association for the Surgery of Trauma

This is the largest academic association of trauma surgeons. Their goal is to promote trauma research and dissemination of research findings to the trauma surgical community. Membership requires that the surgeon be a fellow of the ACS and usually has established him/herself in a community as a trauma surgeon for at least 1 to 2 years after completion of residency/fellowship (<http://www.aast.org>).

The Eastern Association for the Surgery of Trauma

This is another large group of both academic and community surgeons that holds annual meetings with formal paper presentations. Additionally, they have developed some very active subcommittees that focus on practice guidelines and trauma literature reviews. Their prevention committee has also been very active. The membership tends to be younger than that of the AAST, and it is a good place for a junior attending to present his/her first national scientific paper (<http://www.east.org>).

The Western Trauma Association

The Western Trauma Association (WTA) is the only trauma group with widespread representation from trauma subspecialists (ie, orthopedic surgeons; ear, nose, and throat; emergency medicine; neurosurgery; and thoracic

surgery). The scientific presentations are of high quality, and most papers are found acceptable for publication in the *Journal of Trauma and Critical Care*. The subspecialty involvement is critical in trauma care, and the WTA will only allow 40% of its 125 members to be from any 1 field of trauma. This is a great meeting for residents, fellows, and junior faculty to attend, but one must be invited by a member. The multicenter study group from the WTA has published over 20 articles, and they are heavily cited in the trauma literature (<http://www.westerntraumaassociation.org>).

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