

# Acute Care Surgery: What's in a name? A New Specialty Comes of Age

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A new discipline called “Acute Care Surgery” has emerged within the traditional “General Surgery” domain. In parallel, the continued fragmentation of the surgical disciplines into super-specialty “organ-oriented surgeons” has resulted in a paradigm shift away from the traditional concept of the general surgeon who operates on many parts of the body under a variety of conditions. This trend has been a topic of considerable debate worldwide among surgical leaders. Still, young trainees continue to gain post-residency specialization training in their chosen fields. The expected result will be a diminishing number of surgeons available to enter the practice of traditional “general surgery,” with young talented surgeons relegated to practicing surgery only on an outpatient basis despite their desire to continue working under the auspices of a department of surgery.

All acute and emergency cases in an Israeli department of surgery are cared for by a general surgery trainee alongside an attending surgeon on call. The attending surgeon, however, may be a subspecialist such as a colorectal or transplant surgeon, depending on the pre-established call schedule. Similarly, chest or vascular emergencies are most commonly managed by the corresponding expert, who is called in by the emergency department or general surgery team. The Israeli public is generally quite knowledgeable about the expertise of the medical staff, and most patients, given the opportunity, will seek out a subspecialist to manage their surgical problem when a non-emergency, elective, or semi-elective surgery is required.

The creation of the acute care surgery discipline raises many important questions. Is it a true subspecialty? Is further fragmentation of general surgery into another specialty appropriate? What role will such a specialty have during times of critical need, such as war and mass casualty sce-

narios? Is sufficient manpower available for round the clock staffing of an ACS service? Ultimately, changes in the health care system should result in improvements in patient care. Accordingly, a key question is: Will the emergency surgery patient benefit from the expertise of an ACS specialist dedicated to emergency issues? While this trend has occurred in many locations in the world, with growing evidence of substantial benefit, is Israel ready for an expert in acute surgical disease – an ACS specialist?

The objective of this article is to outline the current state of the evolution of acute care surgery and its anticipated impact on the future of general surgery in the United States, other regions of the world, and particularly Israel.

## THE EMERGENCE OF ACUTE CARE SURGERY IN THE USA

During the past 10–15 years, leaders of surgery in the United States have described several forces occurring simultaneously within the traditional discipline of general surgery that challenge the future viability of the specialty [1-5]. Indeed, to the astute observer, the change, as of 1 January 2012, of the name of the *Journal of Trauma* to the *Journal of Trauma and*

*Acute Care Surgery* (as the position of Editor-in-Chief passed from Basil Pruitt, MD FACS; San Antonio, TX, to Ernest E. Moore, MD FACS;

Denver, CO) was certainly not a random event. Rather, this was a carefully planned and deliberate effort on the part of the editorial staff of the journal to acknowledge a growing commitment by many American surgical departments to the Acute Care Surgery concept. Furthermore, and in parallel to the journal's change in name, at the 2011 annual meeting of the prestigious American Association for Surgery of Trauma (AAST), presiding President L.D. Britt, MD FACS (Norfolk, VA) proclaimed that the name of the meeting would be changed, for the first time in 73 years, to the “Congress of Trauma and Acute Care Surgery” in order to better reflect the current practice of the members and attendees and to

**Acute Care Surgery (ACS) has evolved into a subspecialty. This trend is occurring worldwide**

ACS = acute care surgery

further emphasize continued dialogue, research and clinical performance in the new paradigm of acute care surgery, representing a fusion of the specialties of Trauma, Surgical Critical Care, and Emergency Surgery [6,7]. To further emphasize this commitment, the program committee established dedicated educational sessions, termed “Maintenance of Certification,” which highlighted specific acute care surgery topics, as well as dedicated lectures from national acute care leaders, which addressed controversies frequently encountered in the specialty, such as “Thoracic surgery challenges for the acute care surgeon” and “Vascular emergencies every acute care surgeon will encounter.” In actuality, the changes described have been in the making for a number of years, during which the AAST established a subcommittee to establish, evaluate and expand dedicated (2 year) fellowship programs in ACS, consisting of a year dedicated to surgical critical care followed by a vigorous ACS surgical experience [8]. Indeed, there are currently 6 dedicated ACS fellowship programs in the United States, with plans to expand to approximately 20 within the next several years. Furthermore, the AAST now administers an examination to finishing fellows and issues a specialty certificate upon completion. Of note, members of the AAST ACS committee are active within the American Board of Surgery, and these developments have stimulated spirited discussions regarding the future of the core specialty of general surgery.

### ACS can improve patient outcomes and hospital resource utilization

#### WHAT ARE THE FORCES DRIVING THE EVOLUTION OF ACS?

Clearly, the issues that prompted the senior leadership of AAST to question the future viability of trauma surgery as a distinct specialty (leading to the ACS model) appear to have extended well beyond the specialty of trauma. Indeed, such challenges appear to be evolving into a paradigm shift within the entire surgical field [3,5], with international interest as well [9-14].

We describe five predominant factors that appear to be driving these changes:

- *The loss of many elective general surgery cases due to progressive specialization and fragmentation of the general surgery model*

The growth and expansion of knowledge in general surgery has resulted in subspecialization in primary areas of surgical oncology, colon and rectal surgery, transplantation, and minimally invasive surgery. All these specialties offer dedicated fellowships which instruct in the technical skills and knowledge required for specialization in these areas. For example, achieving optimal results of whole-organ transplantation requires that only those with advanced expertise perform these complex procedures. Similarly, due to the experience

and knowledge required, virtually all cases of malignancy reach the hands of dedicated and trained surgical oncologists who can continue to care for patients during their prolonged illness. Further, the utilization of minimally invasive techniques continues to expand as newer areas are explored and applications implemented [15]. Colon and rectal surgeons are particularly well versed in the reconstructive procedures that have been developed for inflammatory bowel disease; similarly, they use minimally invasive procedures to improve patient comfort and satisfaction as well as surgical results [16]. While trainees may include traditional general surgery cases in their practice, this occurs more often in rural communities. Surgeons practicing in large metropolitan areas see a sufficient volume of surgeries to enable dedication to their particular specialty practice.

- *The development of minimally invasive techniques – particularly by medical, gastrointestinal and radiology specialties, which has further diminished the traditional caseload of the general surgeon*

Many procedures that were once performed in the operating room by the general surgeon are currently being performed by various other specialties. Examples include invasive radiology for drainage of abscess, endoscopic retrograde cholangiopancreatography and other gastroenterological endoscopic procedures, stenting procedures performed by invasive cardiologists and invasive radiologists, percutaneous tracheostomy, and bronchoscopy performed by pulmonary specialists.

- *The emergence of the specialty certification of Surgical Critical Care, with the recognition that some patients have unique physiology and may be better managed by a surgical rather than a medical critical care specialist*

Coincident with the changes described, the American Board of Surgery established specific board certification requirements for Surgical Critical Care in 1986. These changes were necessary to ensure that surgeons would continue to care for their patients in an era of ongoing and rapid growth of critical care medicine as a specialty. Interestingly, despite the continued improvements in critical care techniques and associated improved patient outcomes, specialists in critical care available to the health care provider pool are in severe shortage. Indeed, as of October 2011, the American Board of Surgery had issued only 2963 specialty certificates in surgical critical care compared to 57,622 in general surgery [17]. Clearly, despite the importance of surgical critical care to all surgical patients, many surgeons find this specialty less appealing due to the proportion of time required in performing what are perceived as “non-surgical” tasks. On the other hand, in light of the nature of acute and traumatic

AAAST = American Association for Surgery of Trauma

surgical illness, surgical critical care training has become a cornerstone of the trauma surgeon practicing within the ACS paradigm; and the other colleagues in the hospital are pleased to know that their ACS colleagues are available to help care for patients requiring critical care.

- *Decreased operative experience by the traditional trauma surgeon in the U.S.*

The past 20 years has seen a tremendous increase in the use of non-operative management of blunt and penetrating injuries. Changes in the management of blunt trauma patients are most evident in solid organ injuries such as the spleen and liver, for which adult surgeons have learned much from their pediatric surgery colleagues. Furthermore, adjuvant procedures, such as angio-embolization of solid organ injury, have demonstrated particular effectiveness in ensuring continued successful treatment. Other examples include the care of pancreatic injuries (together with ERCP), and other intraabdominal or intrathoracic collections that may be managed safely with percutaneous drainage. As with blunt trauma, although less common, certain patterns of injury are now being managed non-operatively. Examples are the demonstrated efficacy of observation for penetrating anterior abdominal stab wounds [18] and the use of computed tomography scanning to assess trajectories of other penetrating wounds where clinical suspicion is low for penetration of the abdominal cavity [19].

- *The expectations and work habits of current resident trainees*  
Various forces have impacted our current trainees. Firstly, they are increasingly concerned with quality-of-life issues. Simply put, residents are less interested in spending prolonged periods in the hospital and are more concerned with personal needs and satisfaction. At the same time, work hours are generally restricted for residents, both in the U.S. and in other countries. While the relative benefits of these changes to the quality of surgical training have been debated, surgical training seems to have become more “user friendly” to both men and women, who are placing increasing emphasis on their quality of life and family time rather than on the traditional prolonged hours typical of general surgery residency [20,21]. Accordingly, and in parallel, “shift” work has increased in surgery, with assured time off away from the hospital. These changes and expectations have led to the growth of in-house “surgicalists” in the USA, increased interest in locum tenens surgery jobs,

and, potentially greater appeal for the concept of acute care surgery as a specialty.

**IS ACS SUSTAINABLE, AND WHERE IS IT GOING?**

The increasing specialization of surgery, with the particular demands for its practice, has reduced the interest, time and commitment by surgeons to care for patients with acute surgical emergencies. At the same time, the need for such services has grown, due to: a) the aging population (who are living longer with multiple comorbidities), b) the recognition of increasingly complex disease processes, c) the continued need for care of the injured patient, and d) overcrowded understaffed emergency departments dealing with patients who demand rapid, affordable and optimal care (which should be delivered in an efficient manner, optimizing care despite limited resources). In parallel, the evolution of modern critical care techniques have resulted in improved management of the ACS patient [22-24]; such services should be readily available to all patients.

Optimal care of the ACS patient has led to the establishment of a Division of ACS in most academic institutions [1,2,25-29] as well as in certain larger community hospitals that are tertiary referral centers. Many departments of surgery have abandoned

**Under the auspices of the Department of Surgery, the growth of ACS as a distinct specialty will serve to enhance other surgical subspecialties and allow for optimal growth and maturation**

the concept of a “Division of General Surgery,” recognizing that the ACS teams are now the “general surgeons” of the department, with their training in trauma, acute general surgery and, in certain settings, acute thoracic

surgery and acute vascular issues [30]. All medical professionals, however, recognize the importance of constant support for urgent surgical critical care and continuing critical care. Such services, by definition, must be provided continuously, 24 hours per day, 7 days per week [31-33].

Since the ACS model requires the continuous hospital presence of resident as well as attending physicians, a team is required that allows for emergency surgery coverage, trauma coverage, and surgical intensive care unit coverage, and that affords time off after shifts are completed, thus promoting a satisfying personal lifestyle as well. Such a team has been recognized as a major benefit to the hospital [1,5,25-28,32,33] with the ACS patient cared for by dedicated specialists. The team provides efficient care at all times, with continuous follow-up from the point of critical care to discharge. The other specialty surgeons have been pleased with this set-up because it allows them to pursue their elective surgical challenges within their respective discipline. Interestingly, a recent report [34] suggested that although the establishment of an ACS service shifted the bulk of emergency surgery to ACS away from the specialty surgeons, the latter experienced growth of their respective areas which translated into increased revenue as measured by RVUs (relative value units), the net result being a positive impact on all services.

ERCP = endoscopic retrograde cholangiopancreatography

The ACS model is appealing to hospital administrators. The concept has demonstrated marketability, as patients, referring physicians, and institutions appreciate the importance of integrated seamless care [1,2,34-36]. The ACS model also saves hospital costs, as streamlined care reduces the numbers of consults, tests and other resources. The result is a cohesive group working together harmoniously. Current literature reports improved outcomes and expanded interest and dedicated research in areas related to ACS. Of note, there is also evidence that the ACS model has become increasingly popular for resident trainees, because the idea of working a dedicated shift with similar practitioners who share the vision has been appealing [1,5,12,13,20,21,25,37].

In essence, ACS represents the natural maturation of the field of general surgery, and the ACS specialist comes the closest to the traditional concept of the true “general” surgeon.

#### **WHAT ARE THE CURRENT CHALLENGES IN ADAPTION OF ACS IN ISRAEL?**

Freund's recent review [38] of the current surgical landscape in Israel did not directly address the concept of ACS. Nevertheless, a number of current challenges were identified that would require considerable changes to ensure the future viability of general surgery as a distinct discipline. Similarly, an editorial comment to that review by Kluger [39] alluded to the concept of ACS and further supported the notion that significant broad-reaching changes in the current surgical curriculum would be required, not only to sustain but also to enhance and improve the specialty.

Currently in Israel, all practicing general surgeons are required to accept emergency department duty calls. The net result is that subspecialists will frequently be called upon to manage varied and diverse emergency cases that may be far from their main surgical interest and, more importantly, their expertise. Substantial evidence indicates that management of emergency surgery by an expert dedicated to the ACS concept results in improved outcomes. There is no reason to believe that such results will not also be accomplished in Israel. The establishment of an ACS service appears particularly well suited for large departments of general surgery in Israel where multiple specialists practice. Establishment of a dedicated ACS division will complement other surgical services and afford mutual growth and work satisfaction by enabling all surgeons to allocate time for the growth, development and maturation of their skills. This will further enhance research efforts and international collaboration. Clearly, hospitals stand to gain much from these efforts.

We believe that the surgical model that is currently most practiced in the United States, combining emergency surgery, trauma and surgical critical care, will be adopted by the departments of general surgery in Israel. As has already been shown, in the United States, as well as in other regions

of the world, ACS will inevitably enhance the department and rapidly evolve into a very active service.

As was emphasized by Britt [6,7], the ACS service must maintain a degree of flexibility to enable adaptation to local practice patterns. This is of particular importance in Israel, where a substantial portion of the surgical caseload of departments of surgery comes from emergency department admissions. Accordingly, in Israel, non-ACS specialists who are interested and willing to be involved in the ACS service might wish to continue to take emergency department surgery calls as well. Similarly, the expertise of specialist colleagues, such as colon and rectal, minimally invasive, oncologic, thoracic, and vascular surgery, will be a valuable resource for the evolving ACS specialist. In many scenarios, once emergency management issues are addressed, continuing care will likely be assumed by such specialists. This underscores the importance of establishing boundaries with regard to case management and respecting the clinical expertise of specialists at each institution. Lastly, as has been emphasized in other ACS models, implementation of ACS in Israel will serve to enhance and maintain the surgical skill set of the traditional trauma surgeon, whose operative experiences have diminished in recent years.

#### **WHO WILL PRACTICE ACS IN ISRAEL?**

Currently, not all those completing surgical training in Israel seek additional approved subspecialty training. Nevertheless, it will be important to establish structured fellowships in ACS to train the future generation of surgeons for ACS. We believe that such a system will increase the number of surgeons dedicated to in-hospital ACS shifts, in contrast to the current situation in which many young surgeons work outside of the hospital setting. Furthermore, as outlined by Miller and co-authors [34], there is growing evidence that the benefits and influence of an ACS service on clinical productivity for all subspecialties should be reproducible in Israel as the paradigm shift evolves.

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#### **SUMMARY**

A quiet revolution in American surgery has occurred over the past 10–15 years, with the emergence of acute care surgery as a true specialty, and apparently the heir to general surgery. This new paradigm traces its beginning to certain core safety net hospitals in the U.S., such as Denver Health Medical Center, San Francisco General Hospital, Detroit Receiving Hospital, and Grady Memorial Hospital in Atlanta, and has now extended its foothold to most U.S. academic institutions as well. The discipline of acute care surgery represents a fusion of trauma surgery, surgical critical care, and emergency surgery, although the actual surgical responsibilities of the ACS surgeon may vary, depending on local institutional needs, the core principles remain the same. The new specialty appears to have broad appeal not only to the departments in which they

serve, but to resident trainees and hospital administrations as well. While a number of challenges need to be addressed before adaptation of this system to Israel, the new paradigm appears to have potential for serving Israeli surgery in the future.

In summary, there is much to a name. Just as the guardian angel of Aisov gave the new name “Israel” to the biblical patriarch Jacob to signify that he had been elevated to a new level – “a prince in the eyes of G-d and man” [40], “Acute Care Surgery” appears poised to transform General Surgery to a new level for the next generation of surgeons.

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**“There is a foolish corner in the brain of the wisest man”**

Aristotle (384-322 BCE), Greek philosopher and polymath, a student of Plato and teacher of Alexander the Great. His writings cover many subjects, including physics, metaphysics, poetry, theater, music, logic, rhetoric, linguistics, politics, government, ethics, biology, and zoology. Together with Plato and Socrates (Plato's teacher), Aristotle is one of the most important founding figures in Western philosophy

**“Mistakes are part of the dues that one pays for a full life”**

Sophia Loren (born 1934), Italian actress