Achieving zero preventable deaths: A model program
FEATURES

COVER STORY: Achieving zero preventable deaths: A model of a military-civilian medical training partnership 10
Jamie E. Anderson, MD, MPH; Diana L. Farmer, MD, FACS, FRCS; COL Rachel Hight, MD, FACS; and Joseph M. Galante, MD, FACS

MHSSPACS' role in promoting military-civilian partnerships 12
M. Margaret Knudson, MD, FACS

ATLS 10th edition offers new insights into managing trauma patients 15
Sharon Henry, MD, FACS

Scaling-up surgical care in rural Haiti 23
Daniel L. Eisenson; Luther E. Ward, MD; Alexis N. Bowder, MD; Maxi Raymonville, MD; Willy Fils Jean-Louis, MD; Mac Lee Jean-Louis, MD; Thierry Pauyo, MD; Michael L. Steer, MD, FACS; Paul E. Farmer, MD, PhD; and Stephen R. Sullivan, MD, MPH, FACS

2017 ACS Governors Survey: Ergonomic injuries and their prevention 30
David Welsh, MD, FACS; Christopher DuCoin, MD, MPH, FACS; Peter Andreone, MD, FACS; and Juan C. Paramo, MD, FACS

ACS trauma agenda advances on Capitol Hill 37
Justin Rosen
## Contents continued

### COLUMNS
- **Looking forward**  8  
  David B. Hoyt, MD, FACS
- **Coding and practice management corner: Frequently asked questions about CPT coding**  42  
  Jayme Lieberman, MD, FACS; Samuel Smith, MD, FACS; and Jan Nagle, MS
- **ACS Clinical Research Program: Immunotherapy in solid tumors**  46  
  Kevin C. Soares, MD; Jin He, MD, PhD, FACS; Christina L. Roland, MD, MS, FACS; and Judy C. Boughey, MD, FACS
- **A look at The Joint Commission: Advancing health equity in hospitals**  49  
  Carlos A. Pellegrini, MD, FACS, FRCSI(Hon), FRCS(Hon), FRCSEd(Hon)
- **NTDB data points: Through the barricade: Blunt diaphragm injuries**  51  
  Richard J. Fantus, MD, FACS, and Victoria Schlanser, DO

### NEWS
- **Registration open for ACS Quality and Safety Conference, July 21–24**  53
- **ACS, other organizations concerned with patient safety offer recommendations on OR attire**  54
- **Coming next month in JACS and online now**  54
- **Your ACS benefits: ACS Committee on Diversity offers diversity resources**  55
- **Chapter news**  57
  Luke Moreau and Brian Frankel

### SCHOLARSHIPS
- **Health Policy Scholars for 2018 selected**  67
- **ACS awards six Resident Research Scholarships for 2018–2020**  69
- **Faculty Research Fellows for 2018–2020 announced**  70

### MEETINGS CALENDAR
- **Calendar of events**  72

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continued on next page
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As Fellows of the American College of Surgeons, we hold ourselves to exceptionally high standards and strive to do what is best for our patients. Most surgeons, cancer surgeons in particular, often see patients when they are most vulnerable and frightened. As a result, surgeons work hard to develop trusting, caring relationships with their patients.

In his book, *In My Hands: Compelling Stories from a Surgeon and His Patients Fighting Cancer,* Steven A. Curley, MD, FACS, professor of surgery, chief of surgical oncology, and Olga Keith Weiss Chair of Surgery, Michael E. DeBakey Department of Surgery; and associate director for clinical affairs, Dan L. Duncan Comprehensive Cancer Center, Baylor College of Medicine, Houston, TX, provides a vivid glimpse into the bond that cancer patients, their families, and health care professionals inevitably form. He shares many patients’ stories. These vignettes serve as the basis for making a larger point about what ACS President Barbara L. Bass, MD, FACS, FRCS(Hon), so eloquently described in her Presidential Address as the joy and privilege of being a surgeon. He also spotlights some key activities in which surgeons should engage to improve quality of care.

**Establishing the patient-surgeon relationship**

The patient-surgeon relationship is established during the preoperative consultation and evaluation. At this stage of care, it is crucial that the surgeon explain exactly what will occur, the risks associated with the procedure, what the patient needs to do to prepare for the operation, any potential complications, and the benefits of surgery; they also should receive informed consent. Equally, if not more, important, however, are two intangibles—validating the trust the patients and their families place in us and offering hope.

After all of the discussion and tests are over and the paperwork completed, patients commonly tell us they are putting their lives in our hands. Think about that statement for a minute. What patients are telling us is that they have faith that we will take every precaution and apply all of our skills, knowledge, and best judgment to keep them alive and, hopefully, enjoy a higher quality of life than they have known for some time. When patients undergo elective procedures, allowing one person to cut them, they are displaying the highest level of trust. It is their gift to us.

As Dr. Curley writes, “Trust is not something to take lightly or dismiss. It is an honor and a tremendous responsibility for surgeons to be granted such faith in their abilities and care.”

In return, we offer them hope. As a case in point, Dr. Curley describes the preoperative consultation he had with a 69-year-old minister with colon cancer that had metastasized to his liver. The patient had undergone chemotherapy to treat several large tumors in his liver, but this approach wasn’t working. His oncologist told the patient that he probably had six months at best to live, but referred him to Dr. Curley nonetheless. Dr. Curley told him there was a chance that the tumors could be resected, but he would be left with a “sliver of a liver.” The patient’s mood brightened upon learning that there was a chance, albeit small, that he would survive. “Never deny someone hope, Doctor, no matter how hopeless you know the situation to be,” the patient said. “Humans need hope. Without it there is depression, despair, and death.” This man survived for 11 years after his liver operation. His cancer never recurred.

**Our responsibility to our patients and our colleagues**

Unquestionably, the relationships we build with patients can take an emotional toll on many surgeons. It, therefore, comes as no surprise that surgeons suffer from high rates of depression, burnout, substance abuse, and suicide. Some of us avoid these issues by compartmentalizing our professional and personal lives. Others try to detach from their patients. One way they depersonalize their cases is by referring to the body part that is being operated on—that is, the pancreatic cancer or cirrhotic liver—rather than say they operated on a human being with those conditions. Dr. Curley points to the irony of this tendency when operations are such highly personal experiences and
When patients undergo elective procedures, allowing one person to cut them, they are displaying the highest level of trust. It is their gift to us.

the dangers this habit poses for patient-surgeon relations. “What I have learned is that patients don’t want to be abandoned. They want to know that someone will be present and will provide assistance when they have symptoms or fears or need support,” he notes.

“We need to support our own as well,” Dr. Curley adds, stating that we should support our physician, nurse, trainee, and all other caregivers who appear despondent or overwhelmed in the face of caring for patients who are confronting frightening and potentially lethal disease.

Quality improvement activities

In addition, Dr. Curley emphasizes the importance of participating in opportunities to improve the quality of care that our patients receive through collaboration, attendance at morbidity and mortality (M&M) conferences, and tracking both short- and long-term outcomes.

Most surgeons today are accustomed to working as part of multidisciplinary teams and of collaborating not only with clinicians and researchers within our own institutions, but also with health care professionals far and wide. Dr. Curley notes that whenever he visits other institutions, he asks about the problems they are facing and the research they are performing. These conversations often lead to identifying common ground and synergistic approaches to research.

Sometimes collaboration with professionals in other fields can lead to advances in care. Dr. Curley recounts that he was once at a national surgical meeting when two engineers approached him to discuss a new device that might be effective in treating liver cancer. It was a type of needle electrode that would be placed into a tumor and could kill the tumor by heating it. After multiple refinements, this encounter led to the development of radiofrequency ablation of unresectable liver tumors. “Through all this, I learned a marvelous lesson: Always listen to ideas; always look for new opportunities,” Dr. Curley writes.

He describes the important role of M&M conferences and how these meetings should encourage an open, honest disclosure to our surgical peers, trainees, and students of any complication or death that occurred during an operation. It should be an educational opportunity for all present to learn from forthright discussions on improving patient care and surgical outcomes.

Dr. Curley also discusses the importance of tracking patients after surgery. He notes a unique aspect of surgical oncology is that surgeons follow their patients for years, if not their lifetime, watching for the success of the operation, evidence of recurrent or new metastatic disease, and treating symptoms or problems related to the therapies provided.

“One once diagnosed with cancer, patients and their physicians must remain ever vigilant because cancer couldn’t care less about statistics and probabilities. We must persevere and redouble research efforts to improve the survival time and quality of life of ever more of our cancer patients,” he writes.

A celebration of the human spirit

Dr. Curley’s book enlightens the reader on how we serve each other as human beings, professionals, and surgeons. Each story has a message for living life and for recommitting to our values as surgical professionals. And mostly, it is a celebration of the true heroes in the battle against surgical disease—our patients. “They endure the scars, complications, and impairments imposed by the blades of surgical oncologists,” he writes. “I respect the effort, the invincible spirit, and the patients who don’t give a damn about the odds or probabilities; they are going out swinging.”

If you have comments or suggestions about this or other issues, please send them to Dr. Hoyt at lookingforward@facs.org.
Achieving zero preventable deaths: A model of a military-civilian medical training partnership

by Jamie E. Anderson, MD, MPH; Diana L. Farmer, MD, FACS, FRCS; COL Rachel Hight, MD, FACS; and Joseph M. Galante, MD, FACS
In 2016, the National Academies of Science, Engineering, and Medicine (NASEM) published *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths after Injury.* The report called attention to the high number of potentially preventable deaths from trauma in both military and civilian settings. NASEM estimated that nearly 1,000 U.S. service member deaths in Afghanistan and Iraq and approximately 30,000 U.S. civilian trauma deaths in 2014 could have been prevented with optimal trauma care. With the experience of the military, which has a long history of developing new interventions and systems to dramatically improve trauma survival rates, combined with the long-term stability and infrastructure of civilian trauma centers, legislation has been proposed to encourage military-civilian partnerships with the ultimate goal of obtaining zero preventable deaths after injury.

In response to the NASEM report, Congress passed the fiscal year 2017 National Defense Authorization Act (NDAA), establishing the Joint Trauma Education and Training Directorate. The directorate is charged with ensuring that trauma providers in the U.S. Armed Forces maintain a state of readiness by entering into partnerships with civilian academic medical centers and large metropolitan teaching hospitals that have Level I civilian trauma centers. The directorate also will establish metrics for the partnerships to ensure that providers maintain professional competence in trauma care.

Building off of the goals in the NDAA, Congress introduced the Mission Zero Act (H.R. 880/S. 1022) in 2017. The legislation creates a U.S. Department of Health and Human Services (HHS) grant program to assist civilian trauma centers in partnering with military trauma professionals. These HHS grants will help defray the administrative costs associated with bringing military-civilian partnerships to a civilian trauma center. Details about the legislation, which the House of Representatives unanimously passed in February and was awaiting action in the Senate Health, Education, Labor and Pensions Committee at press time, are provided in the article on page 37 of this issue.

The U.S. military has long been a leader of innovative advancements in trauma care, which has translated into dramatic improvements in civilian survival. Recent advancements have been developed through an exchange of ideas among military and civilian partners, including the use of tranexamic acid in trauma resuscitation, resuscitative endovascular balloon occlusion of the aorta, and the use of tourniquets and damage-control resuscitation measures. Close collaborations between researchers from both groups have allowed for these techniques to be developed for use in a variety of settings.

The University of California Davis Medical Center (UCD), Sacramento, is one of several trauma centers in the U.S. with an active military-civilian partnership, both formal and informal. Since 1995, UCD has partnered with the David Grant U.S. Air Force (USAF) Medical Center (DGMC) at Travis Air Force Base in Fairfield, CA, to provide graduate medical education and ongoing clinical currency. This program, called the David Grant Strategic Partnership in Education Advancing Readiness and Research (SPEARR), is an example of what can be achieved through passage of the Mission Zero Act. This article describes the SPEARR partnership, which may serve as an example for future military-civilian partnerships—including trauma care and beyond.
The partnership described in this article is one example of the benefit of military-civilian collaboration developed for the purposes of training, sustainment of skills, and readiness for deployment and for disaster response. Through the Military Health Service Strategic Partnership with the ACS (MHSSPACS), various training and sustainment platforms are being studied with the goal of standardizing operational details and meeting the requirements outlined in the National Defense Authority Act.

The ultimate goal is to develop an optimal resources guide that will facilitate the selection of additional civilian centers to provide training for military trauma teams in preparation for deployment. Additionally, an exchange program allowing civilian surgeons to participate as visiting professors at military treatment facilities would further enhance a truly integrated and continuous learning trauma system that would ensure the best possible treatment for injuries sustained by civilians and by combatants wherever they are deployed.

Residents benefit from research opportunities that both UCD and DGMC offer. Military residents typically perform one year of dedicated research at the DGMC clinical investigation facility (after their third clinical year), and civilian residents have opportunities to perform research at DGMC, just as military residents can also engage in research activities with civilian faculty at UCD.

Other shared resources include simulation equipment and training courses, including Fundamentals of Laparoscopic Surgery and Fundamentals of Endoscopic Surgery training and testing, large animal labs, and robotic simulators, among others. This collaboration also has allowed us to host American College of Surgeons (ACS) Basic Endovascular Skills for Trauma, Advanced Surgical Skills for Exposure in Trauma, and Advanced Trauma Life Support® courses for both military and civilian health care professionals, which would have been impossible without the partnership.

Surgeon readiness
At present, seven active-duty USAF surgeons are embedded among the UCD faculty, including five trauma and acute care surgeons, one thoracic surgeon, and one pediatric surgeon.
Five of these surgeons have full-time volunteer faculty appointments at UCD, whereas two spend most of their appointment at the Air Force base or the VA hospital. Two additional surgeons are reservists in the U.S. Navy and U.S. Air Force, respectively. Beginning in 2012, UCD also hosted full-time Air Force vascular and cardiac surgeons. UCD’s current military faculty members have had appointments ranging from six months to seven years, with a median duration of three years. Most surgeons deploy once every three years (although some deploy annually) and all have deployed at least once.

Integrating active military surgeons into UCD’s department of surgery has been mutually beneficial. To maintain readiness, especially in times of relative peace and minimal military engagements, SPEARR is able to offer our military faculty a high operative caseload, comparable to our civilian faculty. Case complexity is generally higher at UCD than at DGMC because UCD is an academic tertiary hospital with a catchment of 2.5 million people, in contrast to the typically healthier patient population at the active military base. Cases at a Level I trauma center are also more typical of those seen downrange in the military field, which is closer to the battlefield.

Military surgeons also benefit from academic involvement. In 2013–2016, military faculty members in the SPEARR program published more than 20 academic papers and were awarded more than $100,000 in grant funding in collaboration with civilian partners.

**Collaboration beyond surgery**

Beyond the department of surgery, UCD has expanded its collaboration with the USAF. The department of orthopaedic surgery supports an embedded Air Force orthopaedic oncologist. The UCD emergency medicine department has rotating Air Force physicians who support a new, integrated emergency medicine residency. Among embedded department of surgery faculty, UCD now has an emergency medicine neuro-critical care faculty member who is an active member of the USAF. We also share ongoing training opportunities in trauma, critical care, and cardiac surgery for military student registered nurse anesthetists, physician assistant students, enlisted respiratory therapists, critical care nurses, cardiac anesthesiologists, and operating room (OR) nurses and enlisted technicians. The two hospitals also regularly work together to share resources for enhanced patient care, particularly high-cost resources such as UCD’s cardiac catheter lab.

**Structure and challenges**

All active duty military surgeons are employed by the USAF (and ultimately report to their command at DGMC) and have volunteer faculty appointments at UCD. UCD’s military colleagues are integrated into essentially all departmental activities, and typically the expectations and roles are the same for military faculty and residents as for civilian surgeons and trainees.

As with any partnership, SPEARR has its challenges. Military faculty may have sudden or prolonged service obligations, requiring flexibility in call coverage on the part of civilian partners. Both partner hospitals also must work continually to ensure adequate clinical coverage. Negotiating contracts, administrative hurdles, and personnel issues are ongoing challenges, but are not unique to a military-civilian partnership.

Another challenge is the time and cost involved in obtaining state medical licensure for military physicians. Whereas military physicians with out-of-state medical licenses typically are exempt from obtaining a new medical license when administering care to military members, they typically must apply for state licensure when treating civilians. This process is time-consuming and costly and is a barrier to the practice of medicine. In California, medical licensure typically takes several months and costs almost $1,300 for a two-year medical license. We encourage Congress to include in the Mission Zero Act reciprocity policies for medical licensure for military physicians, or at least a fast-track process, to decrease barriers to military-civilian collaboration.
Future directions
UCD and the USAF are proud of the extension of their military-civilian partnership beyond trauma care; nonetheless, this model could be expanded further. For example, including more specialties, as well as mid-level practitioners, nurses, OR technicians, and other ancillary staff, can provide shared educational resources and ongoing readiness for these important providers. Ideal trauma care requires a system, not just a surgeon.

Through our combined expertise, UCD also can provide optimal civilian care, especially in times of disaster. During the 2017 Northern California fires, DGMC medical personnel assisted with evacuations and triage of burn victims, and patients had streamlined transfers to the UCD Firefighters Burn Institute Regional Burn Center for care.

In the future, we anticipate advancements in telemedicine also likely will be a valuable shared resource. Passage of the Mission Zero Act will help other academic medical centers build relationships with their local military partners. The authors urge readers to engage in advocacy for this piece of legislation by using the tools and information located at SurgeonsVoice via www.surgeonsvoice.com.

Conclusion
UCD's partnership with the USAF has been mutually beneficial and sustainable. Ultimately, this model has improved care for all current and future patients. We encourage the creation of additional military-civilian partnerships for trauma care and other specialties. The SPEARR model is beneficial for both the military and civilian partners, and this symbiotic relationship can be the framework for future partnerships. ♦

Disclaimer
Views expressed herein are those of the authors and do not reflect the official policy or position of the Department of the Air Force and Department of Defense or the U.S. government.

REFERENCES
The Advanced Trauma Life Support® (ATLS®) program has endured for nearly 40 years across six continents in 86 countries through 64,000 courses offered to more than 1.1 million students. The American College of Surgeons (ACS) Committee on Trauma (COT) course remains true to its core mission—to provide health care professionals with access to education that will enhance their ability to accurately provide an initial assessment, resuscitate, stabilize, and determine next steps in the care of the injured patient.

The ATLS global educational curriculum provides a systematic, concise approach to trauma patient care in an effort to improve trauma outcomes around the world. The content and skills taught in the course are designed to be adaptable to all health care settings for the care of patients and are intended for the immediate management of the injured patient. The knowledge gained through the course allows participants to rapidly and accurately
assess the patient; stabilize and resuscitate by priority; determine the needs of the patient and whether those needs exceed the resources of the treatment facility; arrange for appropriate definitive care; and ensure that optimal care is provided.

Modifications occur in both format and content with each new edition. This article offers a chapter-by-chapter description of what is covered in the 10th edition of ATLS, which was published in January.

Chapter 1: Introduction and Initial Assessment
A key tenet of the curriculum that remains the same is the ABCDE (airway, breathing, circulation, disability, exposure) algorithmic approach to the rapid initial evaluation of the injured patient. Despite the revision of this approach adopted in the combat and disaster setting, ATLS continues to support prioritizing the rapid assessment and treatment of life-threatening airway and breathing problems ahead of circulation problems. No evidence-based data were identified that justified a modification to this approach in the care of civilian patients.

Chapter 2: Airway and Ventilation
The rapid assessment of the airway by determining the ability of the patient to speak and answer questions appropriately, in addition to verifying adequate ventilation and circulation, has long been a key element in the treatment of trauma patients. In this edition of ATLS, drug-assisted intubation has replaced rapid sequence intubation (RSI) as a broad term that describes RSI and the use of medications to assist with intubation of a patient with intact gag reflexes.

Chapter 3: Shock
Recognizing shock is one of the greatest challenges in the management of the injured patient. During the early management of the injured patient, shock is identified by evidence of end-organ hypoperfusion present on physical examination. Later, simple adjunctive measures can be added to improve the precision of the diagnosis. The classification of shock based on easily measured physiologic variables is attractive.

A table relating physiologic variables with hemorrhage severity has been a part of several ATLS editions. However, some recent literature challenges the accuracy of the classification of hemorrhage and the attributable clinical findings. A retrospective review of severely injured patients in the German trauma registry found variability in clinical findings and ATLS shock classification. The study found base deficit (BD), easily available in many settings, decreased the variability. BD and the need for blood transfusion or the massive transfusion protocol are now included in Table 3.1, reproduced on page 17 of this issue as Table 1.

The initial resuscitation with crystalloid fluid still begins with a 1 liter bolus of warmed isotonic fluid. Large volume fluid resuscitation is not a substitute for prompt control of hemorrhage. Infusion of more than 1.5 liters of crystalloid fluid has been associated with increased mortality. Early control of external hemorrhage is pivotal to the management of the injured patient. Though direct pressure is the first measure instituted to control external hemorrhage in civilian trauma, military experience supports the judicious use of tourniquets placed above the area of injury in uncontrollable hemorrhage. Massive transfusion is defined as the transfusion of more than 10 units of blood in 24 hours or more than four units in one hour.

Early resuscitation with blood and blood products in low ratios is recommended in patients with evidence of Class III and IV hemorrhage. Patients with severe shock resulting from trauma can present with or develop coagulopathy from blood loss, dilution from large volume crystalloid fluid resuscitation, or hypothermia. Some jurisdictions are using tranexamic acid in the prehospital setting. A large prospective study demonstrated decreased mortality when tranexamic acid is given within three hours of injury. When a 1 g dose is given in the prehospital setting, a repeat dose is administered in the emergency department. Early monitoring of coagulation and replacement of clotting factors can minimize transfusion needs, which is particularly important in patients who are taking anticoagulant medications. Thromboelastography and rotational
thromboelastometry are helpful when available to pinpoint the precise coagulation deficiency.

**Chapter 4: Thoracic Trauma**

Life-threatening thoracic injury can result from airway obstruction, tracheal bronchial tree injury, tension pneumothorax, open pneumothorax, massive hemothorax, and cardiac tamponade. Patients with tension pneumothorax who are spontaneously breathing generally present with tachypnea, air hunger, and desaturation. Most of these injuries can be managed through relatively simple maneuvers such as airway control or decomposition of the chest. Successful decompression is dependent on the needle reaching the thoracic cavity, the patency of the catheter, and the correct identification of the appropriate landmarks. Increasing chest wall thickness has led to recommendations to use longer angiocatheters to ensure successful access to the thoracic cavity.

Studies of both prehospital and hospital providers have demonstrated that though landmarks can be appropriately recited, they are not always accurately identified. Cadaver studies have shown improved success in reaching the thoracic cavity when the fourth or fifth intercostal space mid-axillary line is used instead of the second intercostal space mid-clavicular line in adult patients. ATLS now recommends this location for needle decompression in adult patients. Needle decompression can fail to improve clinical decompensation in patients who have hemothorax or in whom the angiocatheter has kinked. Performing a finger thoracostomy can ensure adequate decompression of the chest and eliminate tension pneumothorax as the cause of decompensation.

Evidence-based research and clinical experience indicate that size matters with respect to the optimal size chest tube required to drain a hemothorax. Prospective analysis has shown 28–32 F to effectively drain hemothorax without resulting in increased retained hemothorax.

The focused abdominal sonography for trauma (also known as FAST) technique has been modified to include evaluation of the thoracic cavity for the

---

**TABLE 1. SIGNS AND SYMPTOMS OF HEMORRHAGE BY CLASS**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>CLASS I</th>
<th>CLASS II (MILD)</th>
<th>CLASS III (MODERATE)</th>
<th>CLASS IV (SEVERE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approximate blood loss</td>
<td>&lt;15%</td>
<td>15–30%</td>
<td>31–40%</td>
<td>&gt;40%</td>
</tr>
<tr>
<td>Heart rate</td>
<td>—</td>
<td>—/&gt;†</td>
<td>†</td>
<td>1/1†</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>—</td>
<td>—</td>
<td>—/+</td>
<td>—</td>
</tr>
<tr>
<td>Pulse pressure</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Respiratory rate</td>
<td>—</td>
<td>—</td>
<td>—/+</td>
<td>—</td>
</tr>
<tr>
<td>Urine output</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Glasgow Coma Scale score</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Base deficit*</td>
<td>0 to −2 mEq/L</td>
<td>−2 to −6 mEq/L</td>
<td>−6 to −10 mEq/L</td>
<td>−10 mEq/L or less</td>
</tr>
<tr>
<td>Need for blood products</td>
<td>Monitor</td>
<td>Possible</td>
<td>Yes</td>
<td>Massive Transfusion Protocol</td>
</tr>
</tbody>
</table>

*Base excess is the quantity of base (\(\text{HCO}_3^–\), in mEq/L) that is above or below the normal range in the body. A negative number is called a base deficit and indicates metabolic acidosis.

presence of air. It can aid in the rapid diagnosis of pneumothorax in the emergency department. The presentation and treatment of blunt aortic injury has evolved with the use of thoracic computerized tomographic angiography (also known as CTA) to evaluate for blunt aortic injury. Hemodynamically normal patients with partial injury are now managed with endovascular techniques. The injury is medically managed by decreasing the heart rate (<80 bpm) and mean arterial pressure (60–70 mm Hg) through the use of beta blockers.

A new algorithm for management of patients presenting in traumatic circulatory arrest is included in chapter 4, Figure 4–7 (reproduced as Figure 1 on page 19).

Chapter 5: Abdominal and Pelvic Trauma
In addition to a discussion of blunt and penetrating mechanisms of injury, the 10th edition includes a discussion of injury resulting from explosive forces.

The signs of bladder injury have historically included blood at the urethral meatus, perineal ecchymosis, and a high-riding prostate on physical examination. Today, the high-riding prostate indicator is considered unreliable and not useful in determining which patients should undergo further investigation.

Given the successful use of preperitoneal pelvic packing to control pelvic hemorrhage from pelvic fractures, this section was updated to include this option.

Chapter 6: Head Trauma
Elderly patients suffering ground-level falls are an increasing trauma patient demographic. Many of these patients are treated with anticoagulation, and the use of these medications should be relayed to consulting neurosurgeons.

The new Glasgow Coma Scale (GCS) is introduced in the 10th edition. This version of the GCS stresses reporting the numerical components of the score and adds a new designation, NT (not testable), to be used when a component of the score cannot be assessed.

The 4th edition of the Brain Trauma Foundation’s Guidelines for the Management of Severe Traumatic Brain Injury that are applicable to the early management of the brain-injured patient have been included in the new edition of the ATLS course. These guidelines include avoiding prolonged hyperventilation with \( \text{PCO}_2 < 25 \text{ mm Hg} \); maintaining systolic blood pressure >100 mm Hg for patients 50–69 years and >110 mm Hg or higher for patients ages 15–49 or older than 70 years old to decrease mortality and improve outcomes; diprivan (Propofol) is recommended for the control of increased intracranial pressure but not for improvement of six-month outcomes; barbiturates are not recommended to induce burst suppression measured by electroencephalogram to prevent the development of intracranial hypertension; and prophylactic use of phenytoin or valproate is not recommended for preventing late posttraumatic seizures. Phenytoin is recommended to decrease the incidence of early posttraumatic seizures (within seven days of injury).

Chapter 7: Spine and Spinal Cord Trauma
Determining which patients require imaging to evaluate for spine and spinal cord injury is not always straightforward. The Canadian Cervical-Spine Rule (CCR) and the National Emergency X-Radiography Utilization Study (NEXUS) provide guidelines that can aid in the decision-making process, and these guidelines are included in the chapter and skills stations.

Another change in chapter 7 pertains to the term “spinal immobilization,” which has been replaced with “spinal motion restriction.” An error in the myotome diagram of L4 ankle dorsiflexion and L5 long toe extension has been corrected.

Chapter 8: Musculoskeletal Trauma
Bilateral femur fractures are markers of significant energy mechanism and are risk factors for complications and death in blunt trauma. Antibiotics used to treat open fractures should be dosed based on the patient’s weight to ensure adequate tissue levels are continued on page 20
FIGURE 1. ALGORITHM FOR MANAGEMENT OF TRAUMATIC CIRCULATORY ARREST

Algorithm for management of traumatic circulatory arrest. ECM = external cardiac massage; OTI = orotracheal intubation; IVL = intravenous line; IOL = intraosseous line.
Chapter 9: Thermal Injuries
Modern burn resuscitation has mirrored the changes in trauma fluid resuscitation. Adult patients with deep-partial and full-thickness burns involving more than 20 percent of the total body surface area (TBSA) should receive initial fluid resuscitation of 2 ml of lactated ringers/%TBSA. Target fluid resuscitation is calculated based on 3 ml/kg/%TBSA in pediatric trauma patients and 4 ml/kg/%TBSA for electrical burns.

Half of the fluid is given over the course of eight hours and the remaining half is provided over a span of 16 hours. The rate of fluid administration should be titrated to effect using a target urine output of 0.5 ml/kg/hr in adults or 1 ml/kg/hr in children who are hemodynamically normal. Boluses are reserved for unstable patients.

Chapter 10: Pediatric Trauma
The recommendation for the site for needle decompression of the chest continues to be the second intercostal space mid-clavicular line in this new edition. Damage control resuscitation for pediatric trauma patients is defined as an attempt to limit the use of crystalloid resuscitation, as in adults. An initial bolus of 20 ml/kg bolus of fluid is followed by 10–20 ml/kg of packed red blood cells and 10–20 ml/kg of fresh frozen plasma and platelets as part of a massive transfusion protocol. Thus far, no survival advantage has been demonstrated with this approach.

Chapter 11: Geriatric Trauma
Nearly every country in the world is experiencing a growth in the proportion of older people in their population. The elderly are becoming an increasingly prevalent demographic among trauma patients. The

BIBLIOGRAPHY
following five preexisting conditions affect morbidity and mortality:

• Cirrhosis
• Coagulopathy
• Chronic obstructive pulmonary disease
• Ischemic heart disease
• Diabetes mellitus

Elderly patients with one or more of these preexisting conditions are twice as likely to die as those without.

Pelvic fractures in older patients result in a greater need for transfusion even with stable patterns of injury. The mortality is four times higher with these injuries, hospital stays are longer, and these patients may not return to independent lifestyles.

Chapter 12: Trauma in Pregnancy and Interpersonal Violence

The key content update in this chapter concerns the following: Indication of amniotic fluid leakage is vaginal fluid pH of >4.5.

Chapter 13: Transfer to Definitive Care

Transfer to a higher level of care is necessary when the patient’s needs exceed the capabilities of the institution, and delays in care have the potential to diminish patient outcomes. Performing unnecessary diagnostic tests, particularly computed tomography (CT) scans, may produce such delays. All too frequently, CT scans done before transfer to definitive care are repeated, resulting in time delays to definitive treatment, increased radiation exposure, and increased cost of care. Clear communication between transferring and receiving institutions is important. SBAR (also known as situation, background, assessment, and recommendations) is a useful guide to ensure all important information is relayed.

BIBLIOGRAPHY, CONTINUED


continued on next page
Optional Chapter: ATLS and Trauma
Team Resource Management
Successful care of the injured patient requires not only knowledge of ATLS but also coordinated care by a team using these principles. This Optional Chapter highlights the way the ATLS team can effectively work to deliver care using the ATLS model—stressing the role of the trauma team leader and effective two-way communication.

Instructor update process
All ATLS faculty (coordinators, educators, instructors, and course directors) must be aware of these content updates to be eligible to teach and facilitate 10th edition courses. In addition to the content changes summarized in this article, a number of other changes in the conduct and organization of the course have been implemented. To learn about these changes, an in-person or online update must be completed. In-person updates are encouraged and may be offered by faculty who have been trained in the updates at the regional, state, or site level. In the summer of 2018, an online update course through the ACS learning management system will be available for those individuals who are unable to attend an in-person update. Continuing Medical Education (CME) credits will be offered for the online update and may be offered for the in-person update if the CME award schedule and documentation compliances are followed by the site hosting the update course. Once the faculty member has completed training, a link to a multiple-choice examination will be sent via e-mail for completion.

Acknowledgment
The ATLS Subcommittee and ATLS family are owed a debt of thanks for their tireless contributions to the support and improvement of the ATLS course. The list of those who contributed to this new edition is too lengthy to accurately detail here, but on behalf of the entire ACS COT, the author extends a sincere thank you.
A

n estimated 5 billion people worldwide are without access to surgical care.1 Barriers to surgical care can be framed chronologically as three delays—in seeking, reaching, and receiving care.2,3 The first two delays are challenges for patients in rural communities in low- and middle-income countries (LMICs), where the lack of access to health care services and limited transportation options routinely lead to late presentation of severe disease. Even if a patient reaches a health care facility, there is no guarantee that they will receive surgical treatment. Infrastructure and supply chain problems with essential medicines and basic supplies plague many hospitals in LMICs.1,4,5 World Health Organization surveys of hospitals in LMICs found that many of these facilities do not have access to reliable electricity or running water.1 Furthermore, many could not provide the “bellwether procedures” of a functioning surgical system, such as cesarean section (C-section), laparotomy, or open reduction of fractures.1

To address these barriers, Partners in Health and Zanmi Lasante (PIH/ZL) started to provide surgical care in central Haiti in 1996. These efforts evolved slowly but successfully, resulting in the construction of operating rooms (ORs) at three hospitals and a network

HIGHLIGHTS

• Summarizes PIH/ZL’s efforts to scale-up surgical services in central Haiti
• Describes the design of a study that reviewed these efforts and their effect on surgical volume
• Identifies the role of new road construction in reducing barriers to care, as well as complications related to these enhancements in the form of orthopaedic trauma
of clinics for a catchment area of 3.3 million people. In 2008, an effort was made to increase surgical capacity with visiting surgeons and skilled support staff within the existing infrastructure of these three hospitals. In 2014, PIH/ZL sought to further scale-up surgical care and partnered with the Haitian Ministry of Public Health and Population to build the University Hospital of Mirebalais (UHM). Investments were made not just in training skilled surgical specialists, but also in infrastructure (ORs, surgical ward, and sterile processing) and in supply procurement. Surgical care for the catchment area also became centralized at UHM with a network of ambulances to transfer patients from the rural clinics and hospitals.

The authors conducted a study to evaluate PIH/ZL’s efforts to scale-up surgical services in central Haiti and overcome barriers to surgical care. The study used interrupted time-series analysis to assess changes in surgical volume. This article reports on the study design and findings and offers insights into a path forward.

**Study design**

The study’s primary outcome measure was the monthly total number of surgical operations, collected from OR logbooks at each PIH/ZL hospital in central Haiti. Surgical operations were defined as any procedure occurring in an OR involving the incision, excision, manipulation, or suturing of tissue, and requiring local, regional, or general anesthesia or sedation. Subgroup analyses for total numbers of C-section, laparotomy, and open reduction and fixation of fractures also were collected.

The interrupted time-series analysis was conducted using segmented linear regression and by dividing the time series into pre- and postintervention segments. The time periods each lasted six consecutive months (October–March) and were defined as follows:

- **Time period one, 2007–2008**: A preintervention or baseline time period for surgical care at the three PIH/ZL surgical facilities in central rural Haiti—Cange, Boucan-Carré, and Belladère
- **Time period two, 2008–2009**: A postintervention time period after initiating an effort to scale-up surgical care by increasing surgeons at the same three surgical facilities
- **Time period three, 2014–2015**: A postintervention time period after centralizing and scaling-up surgical services at UHM by increasing surgical staff, infrastructure, supply chain/procurement, and transportation

The segmented regression analysis assessed for changes in the level (step-change) and trend (slope-change) in the total number of operations between time periods. A change in the level constitutes a relatively abrupt effect of the intervention compared with the previous time segment, whereas a change in the slope represents a more gradual change in the total number of operations during a time segment. Observations in time-series data are often correlated, such that the total numbers of surgical operations in adjacent weeks are related. The study adjusted for first-order autocorrelation within the time series using the Prais–Winsten and Cochrane–Orcutt generalized least-squares estimators. Patient characteristics were summarized and compared between time periods. The null hypothesis was that the total number
of operations per month was the same and constant across all time periods. The authors rejected the null hypothesis if statistical evidence indicated that the model parameters (level or slope) of the count of operations were statistically different at the p < 0.05 level. All analyses were done using Stata/SE 12.1 statistical software. The study design was inspected by the human subjects committee at Harvard T.H. Chan School of Public Health, Boston, MA, and by PIH/ZL and was determined to be exempt from review as no identifying information about patients was recorded in this study.

Results
In time period one (2007–2008), 33 surgeons (18 Haitian, 15 visiting surgeons) provided surgical care at facilities in Cange, Boucan-Carré, and Belladère, comprising a total of four ORs and 15 surgical ward beds. In time period two (2008–2009), 62 surgeons with increases in both the number of Haitian and visiting surgeons (31 Haitian, 31 visiting surgeons) operated at the same three sites with the same surgical ward capacity. In time period three (2014–2015), there were fewer total surgeons (53), although the ratio of local-to-visiting surgeons shifted (38 Haitian, 15 visiting surgeons). The surgeons in this group provided surgical care at one facility, UHM, with four active ORs and a 30-bed surgical ward.

In the preintervention time period one, a total of 1,019 operations were performed across the three PIH/ZL surgical facilities in central Haiti. During the postintervention time period two, after scaling-up surgical care with the addition of visiting surgeons within the existing infrastructure, 1,188 operations were performed. During postintervention time period three, after centralizing surgical services at UHM and scaling-up surgical care with additional Haitian surgical staff and fewer visiting surgeons as well as infrastructure, supply chain/procurement, and transportation, a total of 2,134 operations were performed (see Table 1 and Figure 1, page 26).

The results of the segmented regression analyses are summarized in Table 2, page 27. In time period one, the baseline number of operations performed each month followed a significant and positive slope change with an average of 19.3 additional operations performed each month (p = 0.009). With attempts to scale-up surgical care through visiting surgeons in time period two, a significant downward step-change of 59.9 operations per month was detected when compared with time period one (p = 0.05), with no significant change in the slope (p = 0.48).

When surgical services were centralized to the new UHM, along with an increase in local rather than visiting surgical staff and increases in infrastructure, supply chain, and transportation, the total number
of operations each month nearly doubled, with a significant upward step-change of 121.8 additional operations each month above the baseline trend of time period two ($p = 0.001$). No change occurred in the slope of the number of operations performed during time period three ($p = 0.08$).

The total number of operations is summarized for each time period (see Table 1). Among these operations, we performed a subgroup analysis of C-section, laparotomy, and open reduction and fixation of fracture. Figure 2, page 28, depicts trends in these procedures, with the most notable change between
time periods two and three, resulting in a modest increase in the number of exploratory laparotomies, a threefold increase in the number of C-sections, and a disproportionately larger (tenfold) increase in the number of open reduction and fixation of fractures.

A path forward
Scaling-up surgical care requires more than just the presence of additional surgeons. Investments in infrastructure, skilled surgical staff, supply chain management, and transportation are all critical to increasing surgical capacity. This study showed that when the number of surgeons in the Central Plateau was increased without addressing barriers responsible for delays in reaching patients or in the provision of surgical care, no corresponding increase in surgical volume occurred. When increases in surgeons shifted from higher numbers of visiting surgeons to higher numbers of local surgeons, and this change was paired with improved hospital infrastructure (ORs, surgical ward, sterilization equipment), supply chain/procurement, and transportation to the facility, surgical volume increased substantially. Nevertheless, such investments are sometimes considered to be expensive and often are rejected in favor of perceived lower-cost alternatives to providing care.

Across all time periods, the study data showed variation in surgical volume that is most likely attributable to seasonal changes in staffing. For example, a decrease occurs in November and December in all three time periods, as this time frame is when most local staff take their vacation. Changes also occurred in the trend, with decreases in surgical volume in February 2008 of time period one and March 2009 of time period two. Interestingly, these declines both corresponded with collaborative cleft lip/palate surgical missions the following month. Although the goal of these missions was to provide surgical care to children with cleft lip/palate, our data also suggests that these trips came at the expense of overall surgical volume. This situation may have arisen because surgeons and staff shifted their focus from operating to administrative preparation for the mission or may have been because the team wanted to ensure that the surgical ward would be able to accommodate patients during the mission.

Inadequate hospital infrastructure and supply chain problems may have limited the impact of additional visiting surgeons in time period two. As in the case of the mission trips, the number of beds in the surgery ward and the number of ORs proved particularly important. In the first two study periods, if the surgery wards were full, elective operations were canceled despite the presence of additional surgical staff or visiting surgeons. Increasing surgery ward capacity likely improved patient flow postoperatively and increased surgical volume despite no change in the number of ORs and a decrease in the number of visiting surgeons. Although the total number of ORs remained the same among the three study periods, centralizing them at one hospital also may have

<p>| TABLE 2. INTERRUPTED TIME-SERIES REGRESSION ANALYSES OF TOTAL MAJOR OPERATIONS |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Coefficient</th>
<th>Standard error</th>
<th>t Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline trend in time period one</td>
<td>19.3</td>
<td>6.0</td>
<td>3.2</td>
<td>0.009</td>
</tr>
<tr>
<td>Step-change with time period two</td>
<td>-59.9</td>
<td>25.8</td>
<td>-2.3</td>
<td>0.04</td>
</tr>
<tr>
<td>Trend-change in time period two</td>
<td>-5.6</td>
<td>7.6</td>
<td>-0.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Step-change with time period three</td>
<td>121.8</td>
<td>25.3</td>
<td>4.8</td>
<td>0.001</td>
</tr>
<tr>
<td>Trend-change in time period three</td>
<td>-13.5</td>
<td>6.8</td>
<td>-2.0</td>
<td>0.08</td>
</tr>
<tr>
<td>Intercept</td>
<td>94.4</td>
<td>24.6</td>
<td>3.8</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Note: Adjusted for first-order autocorrelation.
increased their use, as the more remote surgical sites were staffed less frequently.

It was initially important to provide care at all three remote sites in the Central Plateau because the roads were unpaved and routinely flooded during the rainy season, creating impassable barriers to patients from one region seeking care in another. Nonetheless, providing surgical care at multiple sites presented serious logistical challenges, leading to interruptions and delays in care as a result of power outages, equipment breakdown, supply stock-outs, and personnel reaching remote sites. When Route Nationale #3 was completed in 2011, connecting the provinces within central Haiti to one another with better roads and connecting the rural Central Plateau to Port-au-Prince, PIH/ZL was able to centralize surgical services in Mirebalais without substantially reducing access for patients in Cange, Boucan-Carré, and Belladère.

The study findings should not serve as a rejection of the principle of decentralization. Decentralizing health care delivery from urban centers to rural areas in LMICs is a well-supported strategy to increase access to care and guided PIH/ZL’s decision to build UHM in the rural Central Plateau instead of in Port-au-Prince. Rather, this study highlights the importance of actively remodeling health care networks to optimize efficiency along with parallel infrastructure development projects.

The increase in the total number of operations is a useful measure of surgical capacity, but looking at the trends in the bellwether procedures provides more information about the quality of the scale-up and the burden of disease in the catchment area. In this study, the most significant increases in surgical volume were related to women’s health and trauma. The substantial increase in the volume of C-sections and urgent and lifesaving procedures represents the greatest success of scaling-up surgical care in central Haiti and underscores the demand for these services in LMICs. New roads facilitated the centralization of surgical services, which contributed to a more efficient system and also reduced the delay in reaching care.

New roads likely contributed to reducing barriers in reaching care, but also brought new complications in the form of orthopaedic trauma. Assuming that the threefold increase in emergency obstetric care describes the effect of increased access to care, the tenfold increase in the number of fracture reductions is more than can be explained by increased access alone, and is likely the result of increased motor vehicle accidents on newly constructed roads. A well-supported surgical system has a critical role in addressing new road traffic-related trauma. Of course, the enormous burden of disease also highlights the importance of road safety management and other proactive interventions to reduce the traffic accidents that predictably accompany major road construction in LMICs.

Lastly, the disproportionately smaller increase in exploratory laparotomies as compared with C-sections and open fracture reductions was surprising. Investments in infrastructure, such as reliable electricity and
equipment maintenance, enabled use of new technology, such as computed tomography, and implementation of new procedures, such as endoscopy, which likely decreased the need for exploratory laparotomies. Other studies have demonstrated the role of ultrasound in reducing the incidence of exploratory laparotomies in Rwanda. Further studies can examine the potential value of less invasive endoscopy and imaging when compared with exploratory surgery in LMICs.

In conclusion, Haiti and other LMICs have a substantial unmet burden of surgical disease. This study should encourage continued investment in surgical infrastructure, procurement and supply chain management, and local skilled surgical specialists in resource-poor settings as the global community works to increase access to safe, timely, and affordable surgical care.

**REFERENCES**

Setting standards for the proper treatment of injuries was one of the motivating factors for the formation of the ACS. Under the direction of the ACS Committee on Trauma (COT), the College seeks to find evidence-based solutions to reduce the occurrence of injuries and their effects.

Businesses have long recognized the problem of injuries in the workplace. Even with the efforts of individual companies and government oversight agencies, such as the Occupational Safety and Health Administration, direct costs for job-related injuries average $15 billion–20 billion annually, with total annual costs reaching $45 billion–54 billion—an expense that companies and insurance groups typically absorb.*

These types of injuries are composed of a number of variables, including occupation, risks involved, and the requirements of the specific job, such as standing for long periods of time, lifting heavy objects, handling objects for extended periods of time, and so on. When injuries occur, businesses are prompted to change processes and to engage in innovative solutions to curb the opportunity for future incidents. Larger, more robust organizations have specific teams dedicated to tracking employee injury patterns and evaluating work processes for opportunities to reduce risks. Smaller organizations typically rely on outside consultants to evaluate the safety of their workplace environment and to make recommendations for improvement.


Editor’s note: The American College of Surgeons (ACS) Board of Governors (B/G) has conducted an annual survey of its members for more than 20 years. The purpose of the survey is to provide a means of communicating the Governors’ concerns to the College leadership. The 2017 ACS Governors Survey, conducted in August 2017 by the B/G Survey Workgroup, had an 88 percent (241/274) response rate.

The following article focuses on Governors’ concerns regarding ergonomic injuries and the preventative steps they take to avoid these injuries.

2017 ACS Governors Survey: Ergonomic injuries and their prevention

by
David Welsh, MD, FACS;
Christopher DuCoin, MD, MPH, FACS;
Peter Andreone, MD, FACS;
and
Juan C. Paramo, MD, FACS
Consistent patterns of work-related injuries are a strong indication that innovative changes are necessary. For example, keying in the category and pricing information by hand during the checkout process at grocery stores eventually led to numerous cases of carpal tunnel injuries, which prompted a practice change. The result was the scanned bar code process, which led to a quicker checkout and a safer process for checkout clerks. Another example of a consistent pattern of work-related injury that led to a systemic change comes from the manufacturing industry. Many manufacturing companies changed the process for unloading delivery trucks after a large number of drivers developed back injuries and hernias that required surgery. These types of complaints also prompted manufacturing companies to train employees on strategies to avoid or decrease injuries. And, in many instances, lifting assist belts and increased mechanization were successfully implemented to reduce injuries and lost worker hours. As these examples indicate, labor-intensive occupations are at risk for injuries, and the medical field is no different from these professions, especially when it comes to performing surgery.
Ergonomic injuries
To better understand the extent of ergonomic injuries among ACS Governors, the 2017 B/G Survey posed a series of questions related to this topic. The results highlight a serious problem, as well as opportunities for our profession to develop work-related injury prevention strategies. This article focuses on several important revelations from the survey.

As surgeons, we are known for our dedication to hard work on behalf of our patients. We love what we do, and therefore, it takes a lot for us to slow down or stop practicing surgery altogether. Of the 241 respondents, 19 percent indicated they had a work-related injury, and 75 percent did not (see Figure 1, page 31).

Of the respondents who indicated they had experienced an ergonomic injury, 65 percent reported they had "undergone therapy, surgery, or stopped performing a procedure due to a work-related injury" (see Figure 2, page 31).

Many surgeons experience an array of physical challenges related to their work but continue to...
practice and take care of their patients. An examination of the U.S. demographics for surgeons reveals an increasing average age for these health care professionals. Similarly, 70 percent of survey respondents are 51 to 65 years of age, and only 15 percent are 50 years old and younger (see Figure 3, page 32). Some regions, such as rural settings, show an even greater increase in average age.

Surgeons typically exhibit resilience and “get the work done” attitudes, but injuries can slow down anyone and, in some cases, lead to early retirement. Barriers, such as patients’ limited access to care, can place additional burdens on surgeons who choose to continue practicing, especially those with work-related physical ailments.†

In the 2017 B/G Survey, respondents were asked about the types of injuries they have sustained, as well as those sustained by colleagues. As expected, the types of injuries varied and were affected by specialty, although the results highlighted areas of concern that crossed specialties, such as those injuries involving the neck, lower back, knees, shoulders, and hands. For professionals who spend long hours at an operating table, deficits in these areas have cumulative negative effects on performance.

Known for their strong work ethic, surgeons typically don’t share with their colleagues when they are dealing with an injury. For example, although 41 percent of ACS Governors indicated they were aware of injured colleagues, 20 percent responded that they were unsure if a colleague had experienced a work-related injury (see Figure 4, page 32). It is likely that the 41 percent who were aware of injuries among their colleagues were referring to more obvious injuries that led to curtailed practice or time off for surgery.

**Prevention**

A growing problem in our profession is the reality that many surgeons are dealing with injuries while continuing to provide patient care. Compounding the problem is the lack of robust interventions to prevent these injuries. Our patient population is growing and the relative surgeon shortage is following a similar trend. If injury prevention strategies for our colleagues are not systemically implemented, the surgeon shortage will artificially increase and productivity will be hampered.

Manufacturing industries lower expenses by reducing injuries. When workers are unable to work because of job-related injuries, lost productivity and

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medical treatment expenses negatively influence the bottom line. Smart business leaders typically consider retaining workers and keeping them healthy more cost-effective than recruiting and training new workers.

Unfortunately, this survey has revealed that the medical profession is not taking care of its “workers” as well as other industries. Only 11 percent of ACS Governors who responded to the survey reported being part of a hospital system that has a program to address and prevent ergonomic injuries (see Figure 5, page 33).

In several cases, respondents indicated that hospitals claiming to have injury prevention programs are “programs in name only.” Many of these hospitals rely on various policies and procedures to handle the problem, such as safety programs, posters depicting proper lifting recommendations, and bound instruction books that seldom leave shelves or desk drawers.
Although this survey did produce several alarming statistics, it also revealed some good news. The discussion of ergonomics is more prevalent than ever and is increasingly a priority for leaders in the health care profession.

**Innovation**

Innovative techniques have reduced hospital stays and improved outcomes. However, innovative procedures also result in surgeons learning new instruments and processes. It takes time and effort for surgeons to find the most effective approach to working with new systems or tools, although, in the end, these innovative techniques also provide hospitals and surgeons with ways to improve patient care. However, when queried, only 24 percent of the ACS Governors worked at a hospital and/or system that considered the ergonomic opinions of surgeons when considering new equipment (see Figure 6, page 34).

Input from surgeons on the feasibility of new equipment could include the following considerations: Do the new instruments fit the hands of all surgeons who could potentially use them? How manageable are the new operating room lights to maneuver and/or set in place? Will the new stretchers in the clinic adjust enough to prevent back injuries?

The constant challenge of implementing preventive strategies to help surgeons avoid ergonomic injuries is reminiscent of “The Upstream Story,” which is often considered a public health parable. In the story, a strong swimmer is on the river bank of a fast-moving stream. The swimmer starts to see drowning individuals in the river and swims out to save and bring them to shore. After rescuing several thankful victims, the swimmer venture upstream. The swimmer is then questioned for leaving instead of staying and rescuing others who might be caught in the strong current. Why is the swimmer leaving? The swimmer wants to learn why people are falling into the river and address the problem at its source rather than just focusing on the end result. Likewise, surgeons treat the injured, but they also seek out the source of injuries to prevent future injuries in other patients. The same approach may be employed when investigating the source of work-related injuries that physicians sustained.

**The good news**

Although this survey did produce several alarming statistics, it also revealed some good news. The discussion of ergonomics is more prevalent than ever and is increasingly a priority for leaders in the health care profession. In the survey, 80 percent of ACS Governors responded that they consider ergonomic issues when beginning a surgical procedure. Only 5 percent said they do not give this consideration before starting a surgical procedure. In fact, surgeons, especially our younger colleagues, are increasingly focused on ergonomics (see Figure 7, page 34).

The first step for process improvement of any kind is to recognize that a problem exists, and to recognize the opportunity for positive change. At Clinical Congress 2017, the Advisory Council for General Surgery and the Advisory Council for Rural Surgery offered an in-depth educational program on ergonomics. At Clinical Congress 2018, the B/G Physician Competency and Health Workgroup and the B/G Survey Workgroup will host another session relevant to this topic.

Similar to the strong swimmer described earlier, surgeons are not only focused on aiding injured colleagues, they also want to prevent the problem from occurring. Governors have indicated they are focused on ergonomic issues before beginning cases. Although these considerations vary by specialty, some significant ergonomic issues that surgeons take into account include the following: paying attention to table height (96 percent); noting the lighting...
situation and arrangement (75 percent); assessing the monitor height (69 percent); and paying attention to the room equipment and how it is arranged (65 percent) (see Figure 8, this page). As obesity levels in the patient population continue to rise, it is important to ensure hospitals have patient transfer capabilities that avoid injury to physicians and staff.

Next steps
Identifying the ergonomic strategies that ACS Governors and other surgeons use to prevent work-related injuries in the operating theater is just a first step toward addressing this issue. Investigating the topics that arise by asking the following assessment questions are another way to prevent work-related injuries: When new instruments are considered by a hospital system, should surgeons ask more questions? Who are the equipment manufacturers’ “customers” when they make changes to their designs and equipment? How can surgeons help themselves and their colleagues avoid injuries while also maintaining their productivity and providing quality care to patients?

In addition to treating our colleagues who are injured and covering for them as they recuperate, surgeons must travel upstream and find the source(s) of the problem(s). But how do physicians start this evaluation process? Small steps include developing a personal “ergonomic timeout,” discussing ergonomic considerations at surgery department meetings, as well as getting involved when it’s time for OR renovations and equipment purchase planning. ♦
One of the key pillars of the American College of Surgeons’ (ACS) federal advocacy agenda is trauma policy. The ACS, through the Division of Advocacy and Health Policy (DAHP), has been a longstanding voice on Capitol Hill for the injured patient and a strong proponent of the work done by the Committee on Trauma (COT). As federal legislators continue to explore ways to improve trauma care and implement the 2016 National Academies of Science, Engineering, and Medicine (NASEM) report, A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths after Injury, it is important to have a strong trauma advocacy agenda and ensure that the ACS has a seat at the table.

Trauma advocacy and policy has a unique role within the ACS because it involves heavy involvement from both the COT and the DAHP. Working closely together, these two areas enable the ACS to craft and implement a well-developed trauma advocacy agenda. These efforts are led primarily through the work of the COT Advocacy Pillar, chaired by Michael Coburn, MD, FACS, and the ACS Legislative Committee, chaired by ACS Regent James W. Gigantelli, MD, FACS. Legislative items are often proposed for support by the COT and directed to the Legislative Committee before action at the state or federal level. This careful coordination was most recently used to support the STOP (also known as the Student, Teachers, and Officers Preventing) School Violence Act. This legislation, which was signed into law in March, provides funding to schools to help address violent attacks.

The ACS also participates in an informal trauma coalition of approximately 20 health care groups and organizations that advocate for trauma-related priorities on Capitol Hill. This coalition represents organizations from the entirety of the health care spectrum (from trauma nurses to trauma centers) and allows for increased advocacy efforts on Capitol Hill.
The end of the debate regarding the repeal of the Affordable Care Act opened the door for Congress to take up smaller and more bipartisan pieces of health care legislation. Several of these legislative proposals have helped to advance a pro-trauma agenda on Capitol Hill, such as legislation to facilitate military-civilian trauma care partnerships, liability reform, and injury prevention efforts. The following is an outline of what is expected throughout the rest of the 115th Congress and provides a summary of ongoing trauma-related legislative activity.

**What’s next in 2018**

Because 2018 is an election year for all members of the U.S. House of Representatives and one-third of the U.S. Senate, most members of Congress will be looking to finish legislative business before departing for the August in-district work period. Before this recess can happen, Congress has a few remaining items that are likely to see legislative action in 2018.

The Pandemic and All-Hazards Preparedness Act (PAHPA) expires September 30 and is up for reauthorization. Congress is likely to vote on this reauthorization request before the August break. PAHPA is an important piece of legislation because it funds the office of the Assistant Secretary for Preparedness and Response (ASPR) and can be a vehicle to help move other trauma-specific bills through the legislative process.

It is likely that Congress also will act on the opioid epidemic by providing additional funding for opioid-related treatment and prevention and by passing legislation to further address the opioid epidemic. The ACS is actively involved in efforts to address the opioid epidemic and is working to ensure that unnecessary one-size-fits-all restrictions are not placed on prescribers. These restrictions could hinder patient care and provide additional burdens for prescribers. Given the unique nature of trauma, it is important that these patients have access to appropriately prescribed pain medication when needed.

The following is a more in-depth analysis on ACS trauma-related legislative priorities, including their status, expected next steps, and ways ACS Fellows can get involved in the legislative process.

**Mission Zero Act**

The Mission Zero Act creates a U.S. Department of Health and Human Services (HHS) grant program to cover the administrative costs of embedding military trauma professionals in civilian trauma centers. By facilitating the implementation of military-civilian trauma partnerships, patients will receive the highest quality of trauma care in times of peace and conflict. This legislation is a step in the direction of implementing the recommendations from the 2016 NASEM report on trauma care mentioned previously. In addition, these partnerships would allow military trauma care teams and providers to gain exposure to treating critically injured patients and increase readiness for when these units are deployed. By building off the goals established in the fiscal year 2017 National Defense Authorization Act through the creation of the Joint Trauma Education and Training Directorate, the Mission Zero Act will assist in achieving and maintaining readiness among military providers, as well as the smooth transition of trauma lessons learned from the military to the civilian setting, by providing the following grant funding for military trauma teams and providers to embed in civilian trauma facilities. Funding would be provided as follows:

- $1 million grant to host military trauma teams at eligible high-acuity Level I trauma centers
- Grants to eligible Level I, II, or III trauma centers to host individual providers ($100,000 for physician or $50,000 for nonphysician providers)

The House of Representatives unanimously passed the Mission Zero Act on February 26. At press time, the bill was awaiting action in the Senate Health, Education, Labor and Pensions (HELP) Committee.
**Good Samaritan Health Professionals Act**
The Good Samaritan Health Professionals Act (H.R. 1876/S. 781) would provide liability protections to health care professionals when they serve as volunteers in response to a federally declared disaster, such as a hurricane or an earthquake.

Hurricane Katrina highlighted the importance of volunteer, trained health care professionals. During that disaster, more than 33,000 volunteer health care professionals responded to the call for assistance through various emergency response programs. Unfortunately, many volunteers were delayed or turned away because of inconsistent state and federal volunteer protection laws, as well as confusion about the application of these laws.

As of press time, the House Energy and Commerce Committee had unanimously passed the legislation, and it was awaiting a vote from the full House of Representatives and action before the Senate HELP Committee.

**PAHPA**
The PAHPA was first enacted in 2006 and is up for its second reauthorization for funding. PAHPA was created to improve the nation’s response to public health and medical emergencies and includes the Emergency Care Coordination Center (ECCC). The ECCC has a large level of oversight for implementing the recommendations of the NASEM report on trauma care.

The reauthorization process involves hearings and legislative action within the congressional committees of jurisdiction—the Senate HELP Committee and the House Energy and Commerce Committee—before action by the full House of Representatives and the Senate.

The ACS is advocating for some of the organization’s trauma-related priorities, such as the Mission Zero Act, the Good Samaritan Health Professionals Act, and the legislative framework for a national trauma system to be included in the PAHPA reauthorization package. At press time, the Senate HELP Committee released a draft of the legislation, and the ACS provided comments to the Committee advocating for inclusion of the aforementioned trauma-related priorities.

**Stop the Bleed**
Stop the Bleed® remains one of the most active programs within the COT/DAHP advocacy agenda. By bringing Stop the Bleed training to congressional offices and state legislatures, it has paved the way for the ACS to build relationships with state, local, and federal legislators across the country while helping to bring this vital program to the public’s attention.

In October 2017, leaders of the ACS hosted Stop the Bleed training for members of Congress. Special guests included Reps. Ami Bera, MD (D-CA); Phil Roe, MD (R-TN); Raul Ruiz, MD (D-CA); and Brad Wenstrup, DPM (R-OH), who provided opening remarks about bleeding control.

The event focused on how early intervention from a Stop the Bleed-trained individual can save the life of someone suffering from a bleeding injury. More than 20 members of Congress and staff came to learn more about the ACS efforts with Stop the Bleed and engaged in hands-on training to learn how to control bleeding. The training sessions were led by ACS Fellows, including ACS Regent Lenworth M. Jacobs, Jr., MD, MPH, FACS; Leonard J. Weireter, MD, FACS; Mark L. Gestring, MD, FACS; John H. Armstrong, MD, FACS; Joseph V. Sakran, MD, MPA, MPH, FACS; and Jack Sava, MD, FACS.

The Stop the Bleed training event featured an appearance from House Majority Whip Steve Scalise (R-LA), who is still recovering from a gunshot injury sustained in June 2017. When Representative Scalise was injured, his wounds were immediately treated with bleeding control techniques by Representative Wenstrup, who was on the scene at the time.

At press time, the ACS had assisted in training approximately 20 members of Congress (see sidebar, page 40) and more than 100 congressional staffers.
These individuals left the training program with a better understanding of how to become lifesaving immediate responders and the value of Stop the Bleed training.

**Violence prevention**

Building upon the injury prevention efforts of the COT and its ongoing work with violence prevention, the ACS supported two related pieces of legislation, the STOP School Violence Act, and the Fix NICS (also known as the National Instant Criminal Background Check System) Act.

The STOP School Violence Act provides funding for schools to assist with implementing programs that will help students and teachers identify signs of violence before violent acts take place. The Fix NICS Act would help to ensure that the NICS is fully functioning and contains the most accurate data. Enhancing NICS will help to ensure that firearms stay out of the hands of individuals who are legally forbidden from possessing them. Injury prevention measures, such as the STOP School Violence Act and the Fix NICS Act, are important to help reduce acts of violence and to further secure our nation’s schools and communities.

In advocating for these bills, the ACS issued letters of support highlighting that far too many Fellows of the ACS see the firsthand results of firearm violence in their operating rooms and trauma centers on a daily basis and outlining the COT’s consensus-driven approach to firearm injury prevention.

The STOP School Violence Act and the Fix NICS Act were signed into law on March 23.

**Research**

The ACS worked with members of the Senate Appropriations Committee to advocate for trauma research language that was included in the fiscal year (FY) 2018 omnibus funding bill—the Consolidated Appropriations Act, H.R. 1625. This language stresses the importance of trauma research and encourages the National Institutes of Health (NIH) to establish a trauma research agenda to minimize the loss of human life, disability, and injury by ensuring that patient-specific trauma care is based on scientifically validated findings.

The Senate Appropriations Committee report language also recognizes the value of having access to high-quality pediatric trauma care and calls upon the Health Resources and Services
Administration (HRSA) to provide a status update on the development of a virtual pediatric trauma center in FY 2019. A virtual pediatric trauma center will provide pediatric patients access to the spectrum of trauma care professionals and will help to address some of the geographic shortfalls in pediatric trauma care. Report language is included with appropriations legislation to guide the administration and departments in support of the committee’s priorities. That language is as follows:

To ensure that our Nation’s trauma response network and workforce remain adequately prepared, the Committee recommends an increased focus by NIH on trauma research, including to establish a NIH-led trauma research agenda coordinated with the extensive, and often groundbreaking, DoD activities on trauma. This research is critical to minimize the loss of human life, disability, and injury by ensuring that patient-specific trauma care is based on scientifically validated findings.*

**Opioids**

The ACS has actively advocated for a patient and provider education-focused approach to addressing the opioid epidemic and limiting one-size-fits-all legislative mandates on prescribers. Advocacy efforts include facilitating a meeting for Co-Chair of the ACS Patient Education Workgroup John Daly, MD, FACS, with the congressional Bipartisan Working Group to discuss opioids in November 2017; and submitting official letters to the House Energy and Commerce Committee, the House Ways and Means Committee, the Senate Finance Committee, and the Senate HELP Committee.

Overall, the College’s advocacy efforts on this topic reiterate the ACS Statement on the Opioid Abuse Epidemic, which calls for fully functioning and interoperable prescription drug monitoring programs, the improved ability for prescribers to electronically prescribe opioids, and any opioid-related Continuing Medical Education to be specialty-specific.

**Why advocacy matters**

On a daily basis, Congress, policymakers, and state legislatures make decisions that have the potential to affect the surgical profession. To have a robust, effective advocacy program, it is essential that all surgeons and Fellows of the ACS join together with a united voice to engage congressional leaders and public officials in support of trauma patients and trauma/surgical priorities.

The ACS DAHP suggests the following activities to support these efforts:

- Attend the Leadership & Advocacy Summit, March 30–April 2, 2019, in Washington, DC
- Learn more, take action, and explore tools and resources available to surgeon advocates online at SurgeonsVoice.org, in addition to engaging via social media (@SurgeonsVoice)
- Host federal/state legislators at your facility/practice
- Site visits
- Trauma facility tours
- Stop the Bleed training courses
- Meet with your member of Congress in your home district or in Washington, DC

The DAHP is available to assist with these efforts and can help you prepare for a successful meeting, event, or facility tour.

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Frequently asked questions about CPT coding

Experts agree that correct Current Procedural Terminology (CPT)* coding may be the single most important area for surgical practice improvement. However, keeping up with the constant changes in claims coding and billing rules can be costly and time-consuming. This column lists several frequently asked questions and the correct coding responses.

**How do I report an open colon resection and colorectal anastomosis with loop ileostomy for fecal diversion?**
You should report CPT code 44146 (see Table 1, page 43). Although the CPT descriptor includes the term “colostomy,” the Medicare physician fee schedule work relative value unit (RVU) for this code is based on creation of either a colostomy or an ileostomy. If this same procedure was performed laparoscopically, the correct code to report would be 44208, Laparoscopy, surgical; colectomy, partial, with anastomosis, with coloproctostomy (low pelvic anastomosis) with colostomy. It is incorrect to report a code for ileostomy or jejunostomy (44310 or 44187) with a partial colectomy code (for example, 44145 or 44207) for this procedure, as doing so would be unbundling.

**What code do I report for a laparoscopic appendectomy for perforated appendicitis?**
Two codes differentiate an open appendectomy without rupture (44950) and with rupture (44960). However, only one code applies to laparoscopic appendectomy (44970), and it is used to report a laparoscopic appendectomy for either scenario; with rupture or without rupture (see Table 2, page 43).

**A 65-year-old female with a remote history of colon cancer undergoes a laparoscopic cholecystectomy for symptomatic cholelithiasis. A concerning lesion is identified on the liver and a laparoscopic biopsy is performed. How is this coded?**
If a laparoscopic biopsy of the liver is performed at the same time as another laparoscopic procedure, report unlisted code 47379, as there is no CPT code for a laparoscopic liver biopsy (see Table 3, page 43). It would be inappropriate to report 49321, Laparoscopy, surgical; with biopsy (single or multiple). Code 49321 is reported only when a biopsy is the only procedure performed. If these procedures were performed via an open approach, code 47600 (open cholecystectomy) would be reported with code 47001, Biopsy of liver, needle; when done for indicated purpose at time of other major procedure (List separately in addition to code for primary procedure), or code 47100, Biopsy of liver, wedge, as appropriate. Unlisted codes have a “YYY” global period, which indicates they are contractor-priced and require documentation that provides pertinent information, including an adequate definition or description of the nature, extent, and need for the procedure, and the time, effort, and equipment necessary to provide the service.

*All specific references to CPT codes and descriptions are © 2017 American Medical Association. All rights reserved. CPT and CodeManager are registered trademarks of the American Medical Association.
How do I report removal of a lipoma of the spermatic cord and repair of a reducible inguinal hernia performed at the same time, through the same incision?

For this clinical scenario, report only the hernia repair code 49505 (see Table 4, page 44). A lipoma or preperitoneal fat that is within the hernia sac or part of the hernia repair would not be separately reported. Code 55520, \textit{Excision of lesion of spermatic cord (separate procedure)}, is a “separate procedure.”

Coding tip: When a procedure that is designated as a “separate procedure” is carried out independently or considered to be unrelated or distinct from other procedures/services provided at that time, it may be reported by itself, or in addition to other procedures/services by appending modifier 59 to the specific “separate procedure” code to indicate that the procedure is not considered to be a component of another procedure, but is a distinct, independent procedure. This may represent a different session, different procedure or operation, different site or organ system, separate incision/excision, separate lesion, or separate injury (or area of injury in extensive injuries).

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How do I report the following excisional debridement work that was performed in a facility setting: 30 square centimeters (sq cm), subcutaneous, right thigh; 45 sq cm subfascial, separate site right thigh; 25 sq cm, subcutaneous, left thigh; and 45 sq cm subfascial, separate site, left thigh? Excisional wound debridement is reported by depth of tissue removed and by total surface area of the wound(s). If multiple separate wounds require different depths of debridement, calculate a total wound surface area for all wounds at each depth. When choosing codes to report, keep in mind that the CPT code numbers for excisional debridement are out of sequence. The codes are reported in descending order of total RVU.

\textit{continued on page 45}
### TABLE 4. HERNIA REPAIR WITH SPERMATIC CORD LESION

<table>
<thead>
<tr>
<th>CPT code(s) to report</th>
<th>Descriptor</th>
<th>Global period</th>
<th>Work RVU</th>
<th>Total RVU</th>
</tr>
</thead>
<tbody>
<tr>
<td>49505</td>
<td>Repair initial inguinal hernia, age 5 years or older; reducible</td>
<td>090</td>
<td>7.96</td>
<td>15.03</td>
</tr>
</tbody>
</table>

### TABLE 5. DEBRIDEMENT

<table>
<thead>
<tr>
<th>CPT code(s) to report</th>
<th>Descriptor</th>
<th>Global period</th>
<th>Work RVU</th>
<th>Total RVU</th>
</tr>
</thead>
<tbody>
<tr>
<td>11043</td>
<td>Debridement, muscle and/or fascia (includes epidermis, dermis, and subcutaneous tissue, if performed); first 20 sq cm or less</td>
<td>000</td>
<td>2.70</td>
<td>4.47</td>
</tr>
<tr>
<td>11042-59</td>
<td>Debridement, subcutaneous tissue (includes epidermis and dermis, if performed); first 20 sq cm or less</td>
<td>000</td>
<td>1.01</td>
<td>1.78</td>
</tr>
<tr>
<td>110446 x4 units</td>
<td>Debridement, muscle and/or fascia (includes epidermis, dermis, and subcutaneous tissue, if performed); each additional 20 sq cm, or part thereof (List separately in addition to code for primary procedure)</td>
<td>ZZZ</td>
<td>1.03 x4 units</td>
<td>1.62 x4 units</td>
</tr>
<tr>
<td>11045 x2 units</td>
<td>Debridement, subcutaneous tissue (includes epidermis and dermis, if performed); each additional 20 sq cm, or part thereof (List separately in addition to code for primary procedure)</td>
<td>ZZZ</td>
<td>0.50 x2 units</td>
<td>0.76 x2 units</td>
</tr>
</tbody>
</table>

+ = add-on code

### TABLE 6. HERNIA

<table>
<thead>
<tr>
<th>CPT code(s) to report</th>
<th>Descriptor</th>
<th>Global period</th>
<th>Work RVU</th>
<th>Total RVU</th>
</tr>
</thead>
<tbody>
<tr>
<td>15734</td>
<td>Muscle, myocutaneous, or fasciocutaneous flap; trunk</td>
<td>090</td>
<td>23.00</td>
<td>43.56</td>
</tr>
<tr>
<td>15734-59</td>
<td>Muscle, myocutaneous, or fasciocutaneous flap; trunk</td>
<td>090</td>
<td>23.00</td>
<td>43.56</td>
</tr>
<tr>
<td>49565-51</td>
<td>Repair recurrent incisional or ventral hernia; reducible</td>
<td>090</td>
<td>12.37</td>
<td>22.20</td>
</tr>
<tr>
<td>49568</td>
<td>Implantation of mesh or other prosthesis for open incisional or ventral hernia repair or mesh for closure of debridement for necrotizing soft tissue infection (List separately in addition to code for the incisional or ventral hernia repair)</td>
<td>ZZZ</td>
<td>4.88</td>
<td>7.76</td>
</tr>
</tbody>
</table>

+ = add-on code
For the clinical scenario in the question, the subcutaneous debridement on the right and left thighs totals 55 sq cm of wound surface area and is reported with 11042 for the first 20 sq cm and two units of 11045 for the additional 20 sq cm and the additional remaining 15 sq cm (20 + 20 + 15 = 55). The subfascial debridement totals 90 sq cm of wound surface area and is reported with 11043 for the first 20 sq cm and four units of 11046 for the additional 70 sq cm (20 + 20 + 20 + 10 = 70). There is a National Correct Coding Initiative (NCCI) edit for the code pair 11042/11043, so modifier 59 (Distinct procedural services) should be appended to 11042 to indicate the subcutaneous debridement was performed at separate sites from the subfascial debridement. Because 11045 and 11046 are add-on codes and additionally do not have an NCCI edit with the other codes to be reported, there is no need to append modifier 59 (see Table 5, page 44).

**Coding tip:** If only one wound is debrided at various depths, report the code that represents the deepest level of debridement, and use the total wound surface area for any and all types of debridement. For example, a single wound requiring 10 sq cm of subfascial debridement and 10 sq cm of subcutaneous debridement would be reported with 11043.

What code is reported for repair of a recurrent, reducible ventral hernia with mesh and both a left-sided and right-sided component separation?

Report 49565 for the hernia repair and 49568 for implantation of mesh. Medicare guidelines do not allow use of modifier 50 (Bilateral procedure) with 15734; therefore, for the work of bilateral component separation, report one unit of 15734 plus a second unit of 15734 with modifier 59 appended (see Table 6, page 44). Note that code 15734 may only be reported once for each side because it represents a musculofascial flap involving the mobilization of the rectus muscle whether performed with anterior or posterior release.

**Coding tip:** Report modifier 59 instead of modifier 51 on the code(s) with lower total RVU for code pairs that have an NCCI edit or to indicate that the same procedure was performed at a different anatomic site (for example, right and left musculofascial flaps). If no NCCI edit exists for a code pair, then append modifier 51 to the code(s) with the lower total RVU.

**Learn more**

Learn more about correct coding at an American College of Surgeons General Surgery Coding Workshop (see box, this page). By attending a coding workshop, you will learn how to report surgical procedures and medical services and will have access to the tools necessary to succeed, including a coding workbook with checklists, resource guides, templates, and examples to keep for future reference. Physicians receive up to 6.5 AMA PRA Category 1 Credits™ for each day of participation.

CODING WORKSHOPS

More information about the 2018 ACS coding workshops is on the ACS website at facs.org/advocacy/practmanagement/workshops.

Upcoming workshops:

- Nashville, TN, August 9–10
- Chicago, IL, November 1–3 (includes a third day devoted to trauma and critical care coding)
Medical and surgical oncologists commonly encounter patients asking about immunotherapy options. What are the data on immunotherapy, and when should it be considered as a treatment option? Immunotherapy, such as checkpoint inhibitors, has demonstrated durable clinical responses in a variety of solid tumor malignancies leading to widespread excitement and optimism. However, objective response occurs in only a small subset of patients. Furthermore, this treatment modality comes at a high cost financially, as well as in terms of immune-related adverse events. As such, biomarkers identifying patients who are more likely to benefit from immunotherapy could save considerable health care dollars and decrease immune-related adverse events in cancer patients.

Mismatch repair-deficient tumors and immunotherapy
Numerous biomarkers have been suggested as predictive of response to cancer immunotherapy, such as tumor lymphocyte infiltrations, mutational burden, and programmed death ligand 1 (PD-L1) receptor expression. After first demonstrating objective response rates of 40 percent in patients with mismatch repair (MMR)-deficient colorectal cancers, Le and colleagues conducted a phase 2 study in patients with MMR-deficient neoplasms in a variety of solid tumor malignancies. A total of 12 different solid tumor types were enrolled, including classically immune-resistant histologies such as cholangiocarcinoma and pancreas cancer. With a nearly 21 percent complete response rate, their findings demonstrate that looking beyond tumor histology is necessary to identify a subset of patients more likely to benefit from checkpoint blockade. Approximately 60,000 gastrointestinal, hepatobiliary, and gynecologic MMR-deficient adenocarcinomas occur annually in the U.S. alone (see Figure 1, page 47). MMR deficiency testing for tumors is now widely available, is recommended in patients with colon or rectal cancer, and is generally applied to a range of solid tumors.

Precision immunotherapy in solid tumors beyond mutational burden
Improved clinical responses with immunotherapy in MMR-deficient cancers are thought to be secondary to a high tumor mutational burden (TMB). This leads to higher levels of neoantigens, thereby facilitating recognition of non-self-epitopes and generating anti-tumor T-cell responses. Next generation sequencing has become widely used in clinical oncology. Using sequencing to assess TMB is affordable and of great practical relevance. Rizvi et al evaluated TMB in 240 patients with advanced non-small cell lung cancer who received an immune checkpoint inhibitor. Patients with response to immune checkpoint inhibition had a higher TMB (median, 8.5 versus 6.6 single-nucleotide variants/megabase; p = 0.0062). Prospective evaluation of TMB as a biomarker to guide checkpoint inhibitor treatment is valuable. Although an increased expression of tumor antigens appears important, the quality of antigens may also...
have important therapeutic implications. In a study of long-term pancreatic adenocarcinoma survivors published in *Nature*, Balachandran and colleagues identified high-quality pancreatic cancer neoantigens via their homology to infectious derived peptides. The presence of these high-quality neoantigens was predictive of long-term survival, whereas neoantigen quantity was not. Thus, quality and not solely quantity of neoantigens may play an important role as a biomarker for immunogenic therapies.

Two recent phase 2 trials have demonstrated efficacy of checkpoint blockade in advanced undifferentiated pleomorphic sarcoma (UPS) and dedifferentiated liposarcoma (DDLPS). SARC028 (A Phase II Study of the Anti-PD1 Antibody Pembrolizumab (MK-3475) in Patients With Advanced Sarcomas) included four subtypes of soft tissue sarcoma \( n = 10 \text{/subtype} \). By RECIST (Response Evaluation Criteria In Solid Tumors), 18 percent of patients had a response, with most of the responses seen in patients with UPS or DDLPS. A0911401 (Nivolumab With or Without Ipilimumab in Treating Patients With Metastatic Sarcoma That Cannot Be Removed by Surgery) was a noncomparative, phase 2 study that randomized patients with advanced soft-tissue sarcoma to nivolumab (anti-PD-1) or combination nivolumab and ipilimumab (anti-CTLA-4). By RECIST, 8 percent of patients responded to anti-PD-1, and 18 percent had responses to combination checkpoint blockade. Based on the success of these two trials, the role of immunotherapy is being investigated in several clinical trials for patients with early-stage disease, including retroperitoneal DDLPS (NCT03307616). Combination checkpoint blockade and radiation are being evaluated in patients with high-risk extremity sarcoma at single institutions (NCT03307616, NCT03338959) and cooperative groups (NCT03092323).
Responses to biologic therapies, the development of resistive clones, and the implications for surgical management requires the surgical community to continue to be at the forefront of multidisciplinary cancer management and research.

Future directions and the need for surgeon participation

Abscopal effect describes the phenomenon whereby treatment at one site may lead to regression of distant metastasis. The mechanism of abscopal effect is likely related to the release of tumor-associated antigens due to treatment, which may be presented to CD8+ T-cells to attack both the primary and metastatic tumors. This effect is most commonly seen with radiation to a site. When immunotherapy is given concurrently with radiotherapy, the abscopal effect is likely boosted. The combination of radiation, anti-CTLA-4, and anti-PD-L1 promotes immunity and increases tumor response in patients with stage IV melanoma (NCT01497808).

With the reinvigorated cancer collaborations organized across the globe, the oncology community’s understanding of the genomic basis of cancer initiation, propagation, and implications for treatment are growing at an unparalleled rate. Diverse factors determine response to immunotherapy. Identification of biomarkers predicting immunotherapy response requires multidisciplinary collaborative approaches. To this end, the U.S. National Cancer Institute has developed an important collaboration through the Partnership to Accelerate Cancer Therapies, which can be found at https://fnih.org/what-we-do/current-research-programs/partnership-for-accelerating-cancer-therapies. This effort brings together public and private entities, including 12 pharmaceutical companies, as part of the Cancer Moonshot Initiative and prioritizes the development of cancer biomarkers predictive of immunotherapy treatment response.

Surgeons play a critical role in the management and understanding of the factors that determine responses to therapy. Responses to biologic therapies, the development of resistive clones, and the implications for surgical management requires the surgical community to continue to be at the forefront of multidisciplinary cancer management and research.

REFERENCES

Achieving health equity is a major social challenge facing our nation. In an ideal world, the best care would be given to all patients—regardless of socioeconomic status, race, gender, or other identifying traits. In reality, however, health care disparities still exist.

Health inequities are the result of many factors, including income, education, geographic location, and other demographic characteristics. Health care equity, on the other hand, focuses on the care that patients receive as they traverse the health care system, such as outpatient clinics, inpatient treatments, medication prescription, and adherence to the prescribed treatment.

Although health care equity represents only a relatively small part of health care delivery, it is still a major challenge and, more importantly, one that is more likely to be influenced by health care providers. Health care equity can contribute significantly to improving outcomes of medical and surgical conditions, as well as our patients’ experience of care.

Peer grouping
I was recently reminded of these challenges when I read an article in the April 2018 issue of The Joint Commission Journal on Quality and Patient Safety.* The study analyzes the effect of hospital peer groups in adjusting for socioeconomic status (SES)—or “social risk”—in the Centers for Medicare & Medicaid Services (CMS) Hospital Readmissions Reduction Program (HRRP). The use of hospital peer groups affects the number and distribution of hospitals penalized for higher readmission rates. This issue is timely, as CMS plans to adopt hospital peer groups for its fiscal year (FY) 2019 rate adjustments. The study findings are unsettling for both hospitals and surgeons.

To provide some perspective, here's some background information on this issue. In 2016, the 21st Century Cures Act directed CMS to develop ways to prevent hospitals that care for more patients with low SES from being inappropriately penalized because of higher readmission rates.* Patients who are poorer or less educated may have fewer resources to help them avoid readmission, which makes it difficult to compare hospitals that disproportionately care for patients with low SES to hospitals that care for patients with higher SES. Grouping hospitals into peer groups with similar patient populations is a proposed solution.

For the study—“Will hospital peer grouping by patient socioeconomic status fix the Medicare Hospital Readmission Reduction Program or create new problems?”—Richard L. Fuller, MS, and colleagues used CMS analysis files for the FY 2017 HRRP final rule and disproportionate share hospital adjustments to assign hospitals to peer groups.* Key findings in the study include the following:

- Use of peer groups introduces differing performance standards for hospitals, which may be affected by factors such as volume or lower-quality care being routinely delivered by hospitals with larger shares of low-SES patients.
- For surgical cases, hospitals with fewer patients had higher readmission rates.

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Health care equity focuses on the care that patients receive as they traverse the health care system, such as outpatient clinics, inpatient treatments, medication prescription, and adherence to the prescribed treatment.

For medical cases, hospitals with fewer patients had fewer readmissions.

The authors observed significant volume-outcome effects for medical conditions, which runs counter to the hypothesis that low-volume hospitals will be resource-constrained when trying to manage hospital readmissions. The authors conclude that further research is required to better understand the volume-outcome relationship observed within medical conditions in the context of the HRRP.

These results are concerning. Just last year, at UW Medicine, Seattle, WA, colleagues and I created a Healthcare Equity Blueprint with the vision of making our health care system a model that other health care institutions could use to improve health equity.

While the creators of the blueprint grant that health care equity is neither a short-term project nor a problem with simple fixes, we assert the blueprint and its goals are the next steps in a long journey. The objectives in the blueprint are as follows:

- Increase diversity, increase cultural humility, and reduce implicit bias in the health care workforce.
- Engage the communities UW Medicine serves as partners in assessing and addressing health care equity.
- Deploy targeted quality improvement and health care services to meet the needs of marginalized populations.

The Fuller article points out a big hurdle to that third objective: Until the playing field is level and hospitals are not penalized for the outcomes of caring for all patients—regardless of SES or other differences—reducing health care disparities will continue to be a challenge.

Learn more

The Fuller study can be accessed at [www.jointcommissionjournal.com/article/S1553-7250(17)30368-9/fulltext]. The Joint Commission has a wealth of resources regarding health care equity, which can be found on its website in the Health Equity web portal. This page includes the following resources:

- Speak Up campaigns on patient advocacy.
- An interview on implicit bias with Ana Pujols McKee, MD, executive vice-president and chief medical officer at The Joint Commission.
- Monographs, standard frequently asked questions, and health equity case studies.

Disclaimer

The thoughts and opinions expressed in this column are solely those of Dr. Pellegrini and do not necessarily reflect those of The Joint Commission or the American College of Surgeons.

The word diaphragm is the term for the large muscle dividing the thorax from the abdomen in mammals. It draws on the term’s Latin and Greek origins and encompasses its true definition as a barricade.

The diaphragm performs an important function in the human body—regulating breathing via its contraction. The diaphragm consists of peripheral muscles that attach to the rib cage, extending to the lumbar vertebra posteriorly, giving it a domed shape. As we inhale, the diaphragm contracts and is drawn into the abdominal cavity while pulling the pleura of the thoracic cavity inferiorly. This movement causes the pleural pressure and alveolar pressure to drop, allowing air to inflate the lungs. As we exhale, the diaphragm relaxes and returns to its resting dome-shaped position.

Disorders of the diaphragm
Anatomic disorders of the diaphragm can be classified as congenital or acquired/traumatic. Congenital disorders are secondary to failure of proper embryologic development. They often are diagnosed in the neonatal period and carry a mortality rate of 45 to 50 percent, secondary to hypoplasia of the lung of the affected side.

Traumatic diaphragm injuries can be caused by either penetrating or blunt mechanisms. Blunt traumatic injury of the diaphragm has an incidence ranging from 1 to 7 percent and is considered a marker of severe injury with other concomitant injuries (thoracic aorta, lung, spleen, hollow viscus, bladder, and pelvis). Shearing of the stretched membrane, avulsion of the diaphragm from its attachment points, and sudden transmission of forces through the viscera are postulated mechanisms of traumatic diaphragm rupture in the setting of blunt trauma.

In 1974, Orville Grimes, MD, described three clinical phases of diaphragmatic injuries: the acute phase at time of injury; a latent phase that may be asymptomatic but evolve into a gradual process of herniation of abdominal contents; and an obstructive phase as a result of visceral or bowel herniation, incarceration, obstruction, strangulation, and possible rupture.

Unfortunately, there is not a pathognomonic sign for diaphragm injury. In general, symptoms are dependent on the size of the muscle defect and the organs herniated into the chest cavity. Computed tomography is the imaging modality of choice with findings of diaphragm discontinuity, intrathoracic herniation of abdominal viscera, and collar sign (constriction of herniated abdominal viscera) to suggest diaphragm injury.

Prevalence of diaphragm injuries
To examine the occurrence of blunt diaphragm injuries in the National Trauma Data Bank® (NTDB®) research admission year 2016, medical records were searched using mechanism of injury and International Classification of Diseases, 10th Revision Clinical Modification codes. Specifically searched were records that contained a mechanism of injury as blunt along with a diagnosis code of S27.80 (injury of the diaphragm). A total of 1,266 records were found, of which 1,033 records contained a discharge status, including 408 patients discharged to home, 296 to acute care/rehab, and 107 to skilled nursing facilities; 222 died. Of these patients, 67 percent were male, on average 45.1 years of age, had an average hospital length of stay of 13.8 days, an intensive care unit length of stay of 11.7 days, an average injury severity score of 32.2, and were on the ventilator for an average of 8.9 days (see Figure 1, page 52). Of those patients tested, 23 percent
(176 out of 755) were over the legal limit for alcohol. This group of patients had some of the highest injury severity scores, lengths of stay, and mortality rates as compared with patients with other injuries described in previous Bulletin articles.

While not a common injury in blunt torso trauma, physicians must maintain a high index of suspicion of diaphragm injury, especially in high-speed motor vehicle crashes or falls from heights. Once identifying an organ that has gone through the barricade, one must be on the lookout for more serious associated intraabdominal and thoracic injuries that may carry significant morbidity and mortality.

Throughout the year, NTDB data are highlighted through brief reports in the Bulletin. The NTDB Annual Report can be found on the American College of Surgeons website as a PDF file at facs.org/quality-programs/trauma/ntdb. In addition, the website contains information about how to obtain NTDB data for more detailed study. To submit your trauma center’s data, contact Melanie L. Neal, Manager, NTDB, at mneal@facs.org.

Acknowledgment
Statistical support for this column was provided by Ryan Murphy, Data Analyst, NTDB.

REFERENCES
Surgical team members, clinical registry experts, and allied and administrative health care professionals who are dedicated to raising the bar on the quality of surgical care and patient safety are invited to attend the American College of Surgeons (ACS) 2018 Quality and Safety Conference, July 21–24 at the Hyatt Regency Orlando, FL.

This year’s event will feature leaders in surgery and a variety of speakers and presentations focused on the following ACS Quality Programs:

- ACS National Surgical Quality Improvement Program (ACS NSQIP®)
- ACS Children’s Surgery Verification Program, and ACS NSQIP Pediatric
- Cancer Programs, including the Commission on Cancer and the National Accreditation Program for Breast Centers
- Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program
- Trauma Quality Programs, including Pediatrics, Trauma Center Verification, the Trauma Quality Improvement Program, and Performance Improvement and Patient Safety

The conference theme, Partnering for Improvement, will set the tone for the meeting, as presenters and organizers strive to achieve the following:

- Provide a professional forum to discuss and apply the most recent knowledge pertaining to national, international, and local quality and safety initiatives in the field of surgery
- Present methods used to analyze data from ACS Quality Programs and demonstrate practical ways to use the data for quality improvement
- Assist hospitals and providers in managing, analyzing, and interpreting data by providing education on proven methods that will empower hospitals and centers to make a positive impact at their facilities
- Enhance the learning experience by offering breakout sessions that educate attendees on the topic areas of their choice and with consideration of their level of programmatic experience
- Assist hospitals and providers in managing, analyzing, and interpreting data by providing education on proven methods that will empower hospitals and centers to make a positive impact at their facilities

An additional track will be dedicated to Optimal Resources for Surgical Quality and Safety, the “red book.” This track will explore concepts and resources from the publication, information on quality improvement tools, methodology, nomenclature, and organizational design and infrastructure. Other notable sessions will highlight important clinical topics, such as efficiency in surgical care, the opioid epidemic, and preoperative optimization.

Keynote speaker Rolf Benirschke, a former placekicker in the National Football League, will discuss his experience collapsing on a cross-country team flight while battling ulcerative colitis and subsequently undergoing two emergency operations within six days. Mr. Benirschke made a successful recovery and came back to play seven more seasons for the San Diego Chargers. To this day, Mr. Benirschke serves as a patient advocate and takes time to connect personally with patients.

Further details about the conference can be viewed on the Quality and Safety Conference web page at facs.org/quality-safety-conference.
The American College of Surgeons (ACS), the American Society of Anesthesiologists, the Association of periOperative Registered Nurses, the Association for Professionals in Infection Control and Epidemiology, the Association of Surgical Technologists, the Council on Surgical and Perioperative Safety, and The Joint Commission recently developed consensus recommendations on operating room (OR) attire. The recommendations focus specifically on ear and hair covering.

The group has reached the following conclusions:

- Evidence-based recommendations on surgical attire developed for perioperative policies and procedures are best created collaboratively, with a multidisciplinary team representing surgery, anesthesia, nursing, and infection prevention.
- The requirement for ear coverage is not supported by sufficient evidence.
- At present, available scientific evidence does not demonstrate any association between the type of hat or extent of hair coverage and surgical site infection rates. In fact, a recent report in the Journal of the American College of Surgeons on head coverings (disposable bouffant or skullcap, cloth cap) identified that the commonly available disposable bouffant hat is the least effective barrier to transmission of particles.

Other issues regarding areas of surgical attire need further evaluation.

For details, read the consensus statement on the ACS website at facs.org/about-acs/consensus-statements/or-attire.

Joint Commission to use recommendations in survey process
In addition, the ACS recently received notification from The Joint Commission indicating that the accrediting body will incorporate the specifications outlined in the consensus statement into its survey procedures for hospitals and other relevant health care facilities.

Coming next month in JACS and online now

Evaluating the effect of margin consensus guideline publication on operative patterns and financial impact of breast cancer surgery

Neal Bhutiani, MD; Megan K. Mercer; Katelynn C. Bachmann, MD; et al, report that widespread implementation of the consensus guideline on margins for breast conservation surgery will likely lead to intended improvement in operative and financial outcomes, as well as patient satisfaction with breast-conserving surgery.

This article and all other JACS content is available at www.journalacs.org.
The American College of Surgeons (ACS) Committee on Diversity Issues is committed to the following goals:

- Keep diversity and inclusion represented in all areas of the ACS
- Engage constituents to ensure their needs are addressed within the workforce, education, and clinical care arenas
- Highlight best practices in surgery addressing workforce diversity, inclusivity, and health care disparities
- Provide data and metrics to guide the efforts on diversity and inclusion for the ACS
- Collaborate with other areas within the ACS both nationally and regionally to support these efforts at all levels

This past year, the committee updated the ACS Statement on Diversity (available at facs.org/about-acs/statements/104-diversity), which all ACS Committees use to ensure diversity among membership and leadership. In addition, the committee regularly supports programming at the Clinical Congress on topics of diversity and cultural competency and recently released new resources to support surgeons with challenges they may face with diversity and cultural competency. These resources include the following:

- **Needs assessment tools**: Diversity, inclusion, and equity can be promoted at both the individual and organizational level, and assessment tools can provide a stimulus to implement change and elucidate deficiencies. Nationally recognized assessment tools are available for member use.

- **Cultural competency at work**: To provide effective and equitable care for patients of all backgrounds, surgeons must recognize and understand the potential influence of culture, divergent beliefs, and values on the ways in which patients and their families seek and receive care as well as the way in which we—as individual surgeons, a profession, and institutions—deliver care. These resources provide an introduction to the key tenets of cultural competence for the surgeon at the individual and institutional level.

- **Recognizing implicit bias**: There is increasing recognition of the role implicit bias plays in health care disparities, including for surgical patients. Implicit bias also may affect how surgeons interact with colleagues, trainees, and other members of the health care team. As implicit bias operates in an unintentional and often unconscious manner, it can exert its influence on the way in which surgeons care for and communicate with patients and team members silently. A series of resources on recognizing implicit bias in surgical practices, as well as a series of quick tests for testing one’s own implicit biases in the workplace, are available.

- **Creating diverse surgical teams**: Diverse teams have been shown to be more effective, creative, and successful. Much of our understanding of diversity within teams comes from business and management literature, but more recently efforts have been made to extend this to the setting of health care teams, including surgical teams. The resources available provide some theory, evidence, and tips on how to foster diversity in the workplace and in the health care team.

All of these resources are accessible from the Committee on Diversity Issues web page on the ACS website at bit.ly/2HpL0Ky.
The only thing more tragic than a death... Is a death that could have been prevented.

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Delaware Chapter holds Day of Surgery

Approximately 80 surgeons and residents attended the Delaware Chapter of the American College of Surgeons (ACS) annual Delaware Day of Surgery in October 2017 at the John H. Ammon Medical Education Center at Christiana Care Health System in Newark. Joseph Bennett, MD, FACS, President of the Delaware Chapter, provided the opening remarks and introduced the keynote speaker, Mary C. McCarthy, MD, FACS, then-Second Vice-President of the ACS.

The morning event commenced with a Resident Trauma Papers Competition, Surgical Jeopardy, and a Simulator Competition. Residents from the Christiana Care Health System who participated in the Papers Competition included Maxwell Braverman, DO, postgraduate year (PGY)-5; Michael Farrell, MD, PGY-4; Ian Wilhelm, MD, surgical critical care fellow; and Richard Wittmeyer, DO, PGY-4. The competition was monitored by Mark Cipolle, MD, PhD, FACS, FCCM, medical director, trauma program, Christiana Care Health System. Drs. Farrell and Braverman, who won first and second place respectively, went on to receive first and second place in the ACS Committee on Trauma (COT) Region III Resident Paper Competition, which took place at the University of Maryland R. Adams Cowley Shock Trauma Center, Baltimore, in December 2017.

Drs. Braverman and Hensley won the Surgical Jeopardy Competition. Residents from the Christiana Care Health System who also participated in a Simulator Competition, included Salman Aziz, MD, PGY-1; Shoshana Levi, MD, PGY-2; Elianne Rojas, DO, PGY-3; Robert Felte, MD, PGY-4; and Michael Lin, MD, PGY-5. The Simulator Competition was led by Peter Santoro, MD, FACS, Delaware Surgical Group, Christiana Hernia Center, Glasgow. The winner of the Simulator Competition was Michael Lin, MD, PGY-5.
Florida Chapter hosts annual meeting

The Florida Chapter of the ACS (FCACS) held its annual meeting April 6–7 in Orlando, led by then-Chapter President-Elect Christine Laronga, MD, FACS, surgical oncologist, Moffitt Cancer Center, Tampa. This year, FCACS hosted approximately 140 attendees and featured faculty, including Patricia Numann, MD, FACS, ACS Past-President, Lloyd S. Rogers Professor of Surgery, Upstate Medical University, Syracuse; George A. Sarosi, Jr., MD, FACS, residency program director, department of surgery, University of Florida College of Medicine, and director, American Board of Surgery; Jay A. Redan, MD, FACS, chief of surgery, Florida Hospital-Celebration Health; and Edward Copeland, MD, FACS, professor of surgery, University of Florida College of Medicine, Gainesville.

The FCACS abstract competition involved nearly 50 poster presenters from the basic science, clinical science, and Commission on Cancer categories. The winners of the resident and medical student poster competitions also were invited to participate in this event. The winners of the 2018 abstract competition are as follows:

- **Basic Science**: Anthony Ferrantella, MD, PGY-2 (University of Miami)
- **Clinical Science**: Juan Mira, MD, PGY-5 (University of Florida)
- **Commission on Cancer**: Michael Gerber, MD, PGY-2 (University of Florida)
- **Resident Poster Winner**: Andre Coombs, MD, PGY-3 (Mount Sinai Medical Center, Miami)
- **Medical Student Poster Winner**: Yao Yang, MPH (University of Miami)

The meeting also featured two competitions for residents, as well as mock oral exams. The winners of the Surgical Olympics were Christina Mesocoraca, DO, Florida Atlantic University, Boca Raton, and Russell Hawkins, MD, University of Florida. The winners of the Surgical Jeopardy Competition were Dr. Hawkins; David Hall, MD; and Patrick Underwood, MD, University of Florida.

For the first time, Florida Committees on Applicants 2, 3, and 4 conducted FACS candidate interviews during the FCACS meeting. More than 40 candidates were interviewed and educated on the ACS and the FCACS.

Georgia Chapter of the ACS holds successful Lobby Day

More than 140 Georgia surgeons and trauma professionals gathered at the Georgia Capitol on February 14 to advocate for distracted driving legislation and offer Stop the Bleed® training. Attendees were welcomed by Georgia Society of the ACS (GSACS) President Thomas E. Reeve, MD, FACS, and GSACS President-Elect Dennis Ashley, MD, FACS.

Both the Georgia Senate and the House of Representatives passed resolutions commending GSACS, the Georgia Trauma Foundation, and the Georgia Trauma Commission, and declared it to be Stop the Bleed Day. Drs. Reeve and Ashley presented the Speaker of the House and the President of the Senate with large trauma stations for their respective chambers, bringing the total number of large trauma stations that GSACS has installed in the Georgia capitol to five.

Indiana Chapter hosts Annual Meeting

The Indiana Chapter of the ACS held its Annual Meeting April 6–7 in South Bend. During the annual business meeting, the
Chapter Executive Council updated members on a strategic planning session that took place in February. Future areas of focus generated by the event include expanding the chapter’s social media presence, providing more meaningful networking opportunities for all chapter members, and fostering a stronger relationship with the statewide residency programs.

In addition, a slate of new leaders was confirmed with unanimous support for five new executive councilors, and four new incoming officers, including the President, Raghu Motoganahalli, MD, FACS. ACS Governor David Welsh, MD, FACS, received the Arthur R. Ellenberger Award for State Advocacy.

Outgoing Chapter President Don Selzer, MD, FACS, kicked off the scientific session with the Presidential Address and an update on happenings at the Indiana Statehouse. ACS First Vice-President-Elect Mark Weissler, MD, FACS, shared why he joined and continues to involve himself in the ACS.

Attendees heard opiate-sparing strategies in the management of postoperative and trauma patients, updates on the role of thromboelastography in the trauma patient, general approaches to common bile duct stones, breast implant-associated lymphoma, operating room air flow assessments, and a review of quality measures with an alternative view of surgical value.

In addition, more than 15 resident and student presenters competed for four awards. A Surgical Jeopardy Competition involving the department of surgery, Indiana University School of Medicine, Indianapolis, and the St. Vincent Indianapolis General Surgery Residency Program completed the festivities.

Japan Chapter holds Annual Meeting during Congress of Japan Surgical Society
The Japan Chapter of ACS held its Annual Meeting April 6 in Tokyo during the Annual Congress of Japan Surgical Society (JSS). ACS President, Barbara L. Bass, MD, FACS, was invited to the business meeting by JSS and provided a lecture titled The Simulation-Based Surgeon in Practice: Retooling Initiative in Adoption of New Technologies.

Kuwait Chapter leads Stop the Bleed campaign
With a population of approximately 4 million people in Kuwait, it has been documented that the most common cause of death in patients younger than 40 years old was trauma from road traffic accidents, accounting for 1.6 deaths per day. Basic first aid training has proven to prepare bystanders to react and provide immediate and efficient treatment for a variety of emergency events related to such injuries.

The Kuwait Chapter of the ACS has introduced a Stop the Bleed® campaign aimed at addressing this issue, with the goal of training the general public to deliver first aid relief at the scene of a traumatic injury. The initiative launched in September 2017, with the chapter providing training under the guidance of then-COT Chair Ronald.
Stewart, MD, FACS, to 150 medical students. By February, a nationwide campaign was under way, with the purpose of raising awareness on basic actions to stop life-threatening bleeding following everyday emergencies. The chapter set up information and training stalls in popular locations across the country, which included training kits and equipment that simulate possible bleeding emergencies. The campaign has proven to be a huge success, with 1,531 participants trained as of today. In addition, public marketing videos are airing on local TV channels and social media platforms.

Kuwait Chapter: Above: Kuwait Stop the Bleed instructors teaching bleeding control techniques to the public. Right: Stop the Bleed instructors.

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Making quality stick:  
Optimal Resources for Surgical Quality and Safety  
The effects of disruptive behavior, mentoring, and coaching on quality improvement  

Editor’s note: In July 2017, the American College of Surgeons (ACS) released Optimal Resources for Surgical Quality and Safety—a new manual that is intended to serve as a trusted resource for surgical leaders seeking to improve patient care in their institutions and make quality stick. Each month, the Bulletin highlights some of the salient points made throughout the “red book.”

As surgical care becomes more coordinated and team-based, it is increasingly important that surgeons model professional behavior. However, in their passionate pursuit of perfection, some surgeons have been known to have angry outbursts or use intimidating or disrespectful language when they are feeling particularly stressed, a case is not going as planned, they feel other team members are unable to meet their exacting standards, and so on. Studies have shown that such disruptive behavior has adverse effects on quality of care and negatively affects team performance. The red book offers recommendations on how surgeon leaders can identify and address disruptive surgeon behavior.

At the opposite end of the spectrum from the disruptive surgeon are mentors and coaches. Mentors form lasting relationships with their mentees, sharing knowledge and helping mentees develop professionally. Mentors typically are based at the same institution as their mentees and have significantly more experience. Coaches are more likely to be called upon to help surgeons improve in a specific area, such as developing leadership abilities or a new technical skill. These relationships are short-term and have well-defined goals, and coaches frequently are recruited from outside the institution. Mentoring and coaching are important facets of establishing a value-based department of surgery.

Be sure to read next month’s “Making quality stick” article for an overview of key points in the red book. Optimal Resources for Surgical Quality and Safety is available for $44.95 per copy for orders of nine copies or fewer and $39.95 for orders of 10 or more copies at facs.org/redbook.

Editor’s note
The April Bulletin cover story on “Excellence in surgery” (pages 10–16) featured a photo of John C. O’Brien, Jr., MD, FACS. Ashley Egan, MD, then a senior resident at Baylor University Medical Center, Dallas, TX, also appears at right in the photo.
Mary O. Aaland, MD, FACS, in memory of Richard E. Quinn, Esq.
Idatonye I. Afonya, MD, FACS, in memory of Rev. Hubert A. Afonya
Suresh Agarwal, MD, FACS, in honor of Lenworth M. Jacobs, MD, FACS
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William Dolan, MD, FACS, and Kari Dolan, NP, in honor of H. Harlan Stone, MD, FACS
Keith E. Dowell, MD, FACS, in honor of Herman W. Wolff, MD, FACS
Kurt D. Edwards, MD, FACS, in honor of Mary J. Edwards, MD, FACS, and Ronald M. Stewart, MD, FACS
Thomas L. Eisenhauer, MD, FACS, in honor of Christopher A. Edwards, MD, FACS; Stuart L. Glassman, MD, FACS; John M. Kogoy, MD, FACS; Lachlan Noyes, MD, FACS; and David C. Price, MD, FACS
Sandra S. Engwall, MD, FACS, in memory of Robert D. Allaben, MD, FACS
Guillermo A. Escobar, MD, FACS, in honor of Mark R. Nehler, MD, FACS
Mauricio A. Escobar, Jr., MD, FACS, in memory of Mauricio A. Escobar, Sr., MD
David N. Feldman, MD, FACS, in memory of David C. Sabiston, MD, FACS
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Christopher A. Grove, MD, FACS, in honor of Margaret M. Dunn, MD, FACS
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Andreas I. Karachristos, MD, FACS, in honor of John M. Daly, MD, FACS; Daniel T. Dempsey, MD, FACS; and John P. Hoffman, MD, FACS
Reza Kermani, MD, FACS, in honor of Mohan K. Rao, MD, FACS
Sarah Klein in honor of William F. Sassar, MD, FACS, and Kenneth W. Sharp, MD, FACS
Melanie L. Konordorfer, MD, FACS, in honor of John I. Hollenbeck, MD, FACS
John B. LaLonde, MD, FACS, in memory of Harry and Della LaLonde
Arthur W. Larson, MD, FACS, in honor of Colonel Ariel Rodriguez, MD, FACS
Richard A. Lynn, MD, FACS, in honor of James S. T. Yao, MD, FACS
Randolph D. Maloney, MD, FACS, in memory of Thomas F. Nealon, Jr., MD, FACS
Stavros N. Maltezos, MD, FACS, in honor of Walter W. Whisler, MD, FACS
Aaron B. Margulies, MD, FACS, in honor of V. S. Klimberg, MD, FACS
Samer G. Mattar, MBBS, FACS, in memory of John G. Hunter, MD, FACS, and in honor of John L. Tarpley, MD, FACS
The ACS Foundation is pleased to thank the donors who have made a National Doctors’ Day tribute gift in honor or memory of both mentors and other individuals who have inspired and supported them!
Editor’s note: Media around the world, including social media, frequently report on American College of Surgeons (ACS) activities. Following are brief excerpts from news stories published from February through April 2018 that mention key ACS programs and initiatives, including research findings that appear in the Journal of the American College of Surgeons. To access the news items in their entirety, visit the online ACS Newsroom at facs.org/media/acs-in-the-news.

Preparation helped Sunnybrook cope with its biggest-ever Code Orange

Toronto Star, April 24

“‘We have joined the club unfortunately, but we were ready,’ continued [Avery] Nathens [MD, FACS,] who also serves as medical director of trauma quality programs of the American College of Surgeons. He was referring to recent mass casualty events in the United States, including last year’s shooting in Las Vegas [NV] and the 2016 shooting at the Pulse nightclub in Orlando, Fla.”

A university hospital surgeon hopes to unite people for a gun violence discussion

San Antonio Express-News, April 20

“A group of trauma surgeons—including a prominent one in San Antonio [TX] who helped treat victims of the mass shooting in Sutherland Springs—released a set of strategies Thursday that aim to reduce firearm-related injuries and deaths in the U.S.

“The group hopes its new strategies, which will be published in the Journal of the American College of Surgeons in the coming months, will foster dialogue among the public and policymakers on both sides of the debate.”

Suffolk honored its top doctor and a hometown native

Virginian-Pilot, April 17

“The plaques, which will be permanently displayed at both entrances of the building, note that [L. D.] Britt [MD, MPH, DSc(Hon), FACS, FCCM, FRCSEng(Hon), FRCSEd(Hon), FWACS(Hon), FRCSI(Hon), FCS(SA)(Hon), FRCSGlasg(Hon),] is a Henry Ford Professor and Edward J. Brickhouse Chairman at the Eastern Virginia Medical School, former president of the American College of Surgeons and first African American in the U.S. to receive an endowed chair in surgery at a major American medical school.”

In rural areas, recruiting and retaining doctors are no easy tasks

American Association for Physician Leadership, April 12

“While some health care organizations entice newly minted physicians with loan payoffs, this recruitment strategy doesn’t
necessarily result in retention beyond the obligation period. “Other factors, such as adequate call coverage and autonomy over one’s practice, tend to have a greater influence on loyalty, says Tyler Hughes, MD, FACS, founding chair of the American College of Surgeons’ Advisory Council for Rural Surgery.”

No benefit from adjuvant therapy for ampullary tumors
Medscape, April 3
“In this study, Dhar and colleagues sought to better define the role of adjuvant therapy in the treatment of patients with resected ampullary tumors. Using the American College of Surgeons National Cancer Database, they identified 5,298 patients with ampullary tumors, stage I through III, that had been surgically removed between 1998 and 2006.”

Burn deaths down from 1989 to 2017 in the United States
Physician’s Weekly, March 15
“Burn injury survival has dramatically increased over the past 30 years, according to a study published online March 9 in the Journal of the American College of Surgeons.

Everyone can learn hemorrhage control on ‘National Stop the Bleed Day’
Chicago Tribune, March 8
“Surgeons developed a training course for people with no medical background, and the course was offered by volunteer instructors. The American College of Surgeons estimates that about 120,000 people have taken a Stop the Bleed® course, but one group of veterans thought more people should be exposed to the life-saving training.”

Americans should have access to bleed control training
The Hill, February 13
“In October 2015, the White House and the American College of Surgeons launched Stop the Bleed, a program that provides individuals with the education and training they need to stop blood loss and save lives. The program was developed by the Hartford Consensus to Enhance Survival in Intentional Mass Casualty Events in April 2013, just a few months after the active shooter tragedy at Sandy Hook Elementary School. Just like CPR classes teach bystanders to assist people in cardiac arrest, a brief 20–30 minute Stop the Bleed class can teach anyone how to stop excessive bleeding. After calling 911, a person losing blood is still in grave danger. Stop the Bleed classes help bystanders act decisively and safely to save lives.”

Older patients recover from surgery faster if they “train” for it
CNBC, February 11
“Patients who prepped were also less likely to land back in the hospital.

‘Prep is as important if not more important than the surgery itself,’ said Dr. Ronnie Rosenthal [MD, MS, FACS], chair of the American College of Surgeons Geriatric Surgery Task Force.”

Trump wants to reduce opioid prescriptions by one-third. We can start now
STAT, March 30
“Research we conducted and published in the Journal of the American College of Surgeons shows how surgeons can determine an appropriate prescription. We found that many patients use less than one-third of the opioids prescribed to them, allowing unused medications to sit in a bathroom cabinet or be diverted or stolen for illicit use.”
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Eighteen surgeons will be attending the Leadership Program in Health Policy and Management presented by the Heller School of Brandeis University, Waltham, MA, in June 2018 as Health Policy Scholars. Each scholarship includes participation in the weeklong intensive course, followed by a year’s service in a health policy-related capacity for the American College of Surgeons (ACS) and the surgical specialty society cosponsoring the awardee.

This year’s scholars are as follows:

- ACS Health Policy Scholar for General Surgery: Sarah Parangi, MD, FACS, Massachusetts General Hospital, Boston
- ACS Health Policy Scholar for General Surgery: Dev M. Desai, MD, PhD, FACS, Children’s Health, Dallas, TX
- ACS/Americas Hepato-Pancreato-Biliary Association Health Policy Scholar: Maria B. Majella Doyle, MD, MBA, FACS, Washington University, St. Louis, MO
- ACS/American Association of Neurological Surgeons Health Policy Scholar: Maya Babu, MD, MBA, University of Miami, FL
- ACS/American Academy of Otolaryngology-Head & Neck Surgery Health Policy Scholar: Robert O. Brown, MD, FACS, Greenville Head & Neck Surgery, SC
- ACS/American Association for the Surgery of Trauma Health Policy Scholar: Krista L. Kaups, MD, MSc, FACS, Community Regional Medical Center, Fresno, CA
- ACS/American Pediatric Surgery Association Health Policy Scholar: Marion C. W. Henry, MD, FACS, University of Arizona, Tucson
- ACS/American Surgical Association Health Policy Scholar: Dmitry Oleynikov, MD, FACS, University of Nebraska Medical Center, Omaha
- ACS/American Society of Breast Surgeons Health Policy Scholar: Sharon S. Lum, MD, FACS, Loma Linda University, CA
Each scholarship includes participation in the weeklong intensive course, followed by a year’s service in a health policy-related capacity to the ACS and the surgical specialty society co-sponsoring the awardee.
The American College of Surgeons (ACS) has awarded six Resident Research Scholarships for 2018–2020. The scholarships are offered to encourage residents to pursue careers in academic surgery and carry awards of $30,000 for each of two years, beginning July 1, 2018. These scholarships are supported by the ACS Foundation’s Scholarship Endowment Fund.

The recipients of these scholarships are as follows:

- **Maria Christine Cusimano, MD**, postgraduate year (PGY)-4, University of Toronto, ON. Projected specialty: Gynecologic surgery. Research project: Surgical Management of Risk in Hereditary Ovarian Cancer.


- **Michael J. Zobel, MD**, PGY-3, University of California, San Francisco; project to be undertaken at Children’s Hospital Los Angeles, CA. Projected specialty: Pediatric surgery. Research project: The Role of CCL2 and CCL7 in Metastatic Neuroblastoma.

- **William Warren Phillips, MD**, PGY-3, Northwestern University, Chicago, IL; project to be undertaken at Brigham & Women’s Hospital, Boston, MA. Projected specialty: Cardiothoracic surgery. Research project: Identifying Barriers to Lung Cancer Care in Vulnerable Patient Populations.

An updated description and requirements for this program will be posted on the ACS website at www.facs.org/member-services/scholarships/resident/acsresident. The application deadline for the 2019 Resident Research Scholarships is **September 14, 2018**.

The Scholarship Endowment Fund was established to provide income to fund scholarships and fellowships awarded by the Board of Regents. Direct contributions to support the Scholarship Endowment Fund are welcome. Fellows wishing to make tax-deductible gifts to fund these vital programs are encouraged to contact the ACS Foundation at 312-202-5338.
The American College of Surgeons (ACS) has awarded four Faculty Research Fellowships for 2018–2020. The fellowships are offered to encourage young academic surgeon-scientists to establish their own laboratories and carry awards of $40,000 for each of two years, beginning July 1, 2018. These fellowships are supported by the ACS Foundation’s Scholarship Endowment Fund.

**Named Fellowships**
The ACS offers two Faculty Research Fellowships that recognize ACS leaders. The Franklin H. Martin, MD, FACS, Faculty Research Fellowship honors the founder of the College, and the C. James Carrico, MD, FACS, Faculty Research Fellowship for the Study of Trauma and Critical Care honors the late Dr. Carrico.

The recipients of these fellowships are as follows:


**Undesignated Fellowships**
Additional undesignated Faculty Research Fellowships for 2018–2020 were awarded to the following surgeons:

- **Pablo E. Serrano Aybar, MD, MPH, MSc, FACS**, assistant professor, McMaster University, Hamilton, ON. Specialty: Surgical oncology, hepatopancreato-biliary surgery. **Research project**: Perioperative Optimization with Nutritional Supplements in Patients Undergoing Gastrointestinal Surgery for Cancer (PROGRESS), a pilot feasibility study.

- **Catherine Juillard, MD, MPH, FACS**, assistant professor of surgery, University of California, San Francisco. Specialty: Trauma, critical care. **Research project**: Building capacity for trauma quality improvement in a resource-poor country.

**Applying for and supporting fellowships**
An updated description and requirements for this program will be posted to the Scholarships webpage. The application deadline for the 2019 Faculty Research Fellowships is **November 15, 2018**.

The Scholarship Endowment Fund was established to provide income for scholarships and fellowships awarded by the ACS Board of Regents. Direct contributions to support the Scholarship Endowment Fund are welcome. Fellows who would like to make tax-deductible gifts to fund these vital programs are encouraged to contact the ACS Foundation at 312-202-5338.
You are your best advocate.

Meeting with elected officials is a powerful way to raise the profile of issues you care about and to effect change. Through the Division of Advocacy and Health Policy’s (DAHP) Advocate at Home program, staff can assist with planning, preparing for, and executing a successful meeting or event that will leave your lawmaker wanting to know more about issues of importance to surgeons and patients.

- Develop relationships with lawmakers via in-district meetings
- Leverage your expertise with your representative or senators by offering to serve as their trusted resource, allowing these policymakers a unique opportunity to hear your story
- Continue to advocate for meaningful change at home
- Elevate the College’s health policy agenda at the local and state levels
- Track your progress

To learn more:
Contact Michael Carmody, Congressional Affairs Coordinator, at mcarmody@facs.org or Katie Oehmen, Manager, ACSPA-SurgeonsPAC and Grassroots, at koehmen@facs.org.

surgeonsvoice.org
Calendar of events

*Dates and locations subject to change. For more information on College events, visit facs.org/events or facs.org/member-services/chapters/meetings.

**JUNE**

**Mississippi & Alabama Chapters**
June 7–9
Miramar Beach, FL
Contact: Lisa Beard, alcollegesurgeons@yahoo.com, www.alabamaaacs.org

**Northeast Mexico Chapter**
June 14–16
Monterrey, Mexico
Contact: Dr. Adolfo Leyva-Alvizo, adolfoleyva@gmail.com

**Arkansas Chapter**
June 30–July 1
Little Rock, AR
Contact: Linda Gist, linda92@comcast.net

**Tennessee Chapter**
August 10–12
Nashville, TN
Contact: Wanda G. McKnight, wanda@tnacs.org, www.tnacs.org

**Colombia Chapter**
August 14–17
Cartagena de Indias, Colombia
Contact: Sonia Barbativa, soniapatiriciab@ascolcirugia.org

**Georgia Society of the ACS**
August 17–19
St. Simons Island, GA
Contact: Kathy Browning, gasacs@gmail.com, www.georgiaacs.org

**Arizona Chapter**
September 22–23
Tucson, AZ
Contact: Joni Bowers, jonib@azmed.org, www.azacs.org

**OCTOBER**

**Kentucky Chapter**
October 12
Lexington, KY
Contact: Linda Silvestri, lsilv2@uky.edu, kentuckychapter.facs.org

**Regional 15 Meeting**
October 14–18
Rome, Italy
Contact: Dr. Antonio Di Catalda, dicataldoa@tiscali.it, www.facsitaly.org

**SEPTEMBER**

**Region 14 Meeting**
September 11–15
Rio de Janeiro, Brazil
Contact: Dr. Savino Gasparini, scgasparini@mls.br

**Jordan Chapter**
September 12–14
Amman, Jordan
Contact: Dr. Majdi Al Soudi, alsoudi@gmail.com, acsjordan.com

**Oklahoma Chapter**
September 21
Tulsa, OK
Contact: Nathalia Granger, ngranger@facs.org

**FUTURE CLINICAL CONGRESSES**

2018
October 21–25
Boston, MA

2019
October 27–31
San Francisco, CA

2020
October 4–8
Chicago, IL