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Bulletin

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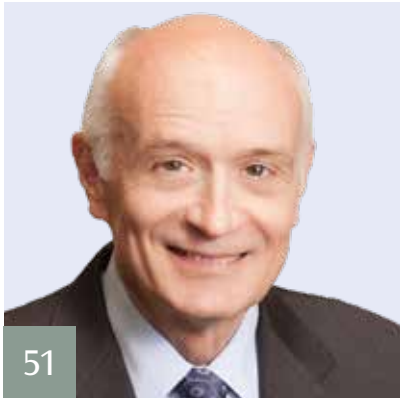

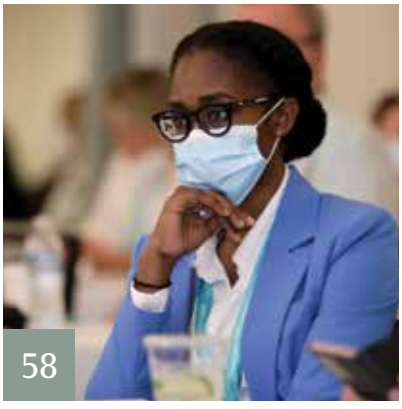

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NEWS

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Surgical Metrics and Self-Regulation

by Patricia L. Turner, MD, MBA, FACS

As a profession, we are entrusted with the privilege and responsibility of self-regulation. We set our standards, measures, and control other significant aspects of how we practice surgery, as well as all elements of the related preoperative, postoperative, consultative, and postdischarge patient care. Some of the challenges in healthcare reform over the years demonstrate what can happen when those who have never cared for a patient make decisions about the delivery of essential care. If we do not self-regulate appropriately, or don't use evidence-based metrics, other entities would be pleased to regulate our profession for us.

While we are fortunate to regulate ourselves, the responsibility is substantial. The well-being of our individual patients, and our broader impact on the healthcare system, is in our hands. Our impact reaches far beyond a single patient to all patients in all communities, as we strive to heal all with skill and trust.

The concept of self-regulation must utilize every voice and every experience of the operating surgeon. There has historically been an emphasis on competency-based medical education. The notion that outcomes and observable abilities are more meaningful than purely time-based documentation is now reflected broadly in the literature across many specialties.

The Missing Piece

The training and continuing education of a surgeon, by and large, is designed to build that surgeon's fund of knowledge. Our Board examinations comprise both multiple-choice questions and open-ended oral exam answers. We read textbooks and the current literature and learn through daily interactions with colleagues and mentors. What is missing is a way to know if an individual can actually operate. How can we, as a profession, accurately and meaningfully assess the technical skills of a surgeon? What mechanisms can we apply to measure our surgical abilities and competencies?

Those attending Clinical Congress next month in San Diego will be able to participate in an early pilot that represents a potential step toward objectively assessing surgeons' skills by identifying the best techniques of expert surgeons.

The Surgical Metrics Project, as you'll read on pages 54–55 of the *Bulletin*, will be part of our Exhibit Hall offerings near ACS Central. The project measures a surgeon's performance for a specific surgical skill through synchronized video, audio, and motion detection. In this case, it is a 30-minute laparoscopic ventral hernia repair using a tabletop fabric model of the abdominal wall. Following the procedure, a surgeon will get a snapshot report card of his or her results.

We were excited and encouraged when this program debuted at Clinical Congress 2019 in San Francisco, and we look forward to increasing the data collected during this year's event. As Carla M. Pugh, MD, PhD, FACS, professor of surgery and director of the Technology Enabled Clinical Improvement Center, said, "Mapping the technical decisions of experienced surgeons allows the creation of risk-assessment maps that provide great insight into the efficiency and potential risks of certain actions and decisions."

In 2019, 255 surgeons of all experience levels took part in the project to "run the bowel" and make two repairs on porcine intestine. Because EEG sensors measured brain waves, neural activity at critical points of the procedure was tracked; in addition, leak rates of different methods of performing the operation were recorded. The data provided valuable insight into best techniques, allowing the surgeon to reassess decision-making processes.

There may be dozens of ways to approach any given operation, and the Surgical Metrics Project will help us determine which of those methods are most efficient and effective, and which are not ideal—across hundreds

Once it is clear how experts perform operations, those data can be used to determine how a novice can proceed to mastery.

of common surgical procedures, across all specialties. As we learn and evolve, it may be possible to definitively state that there is a "best" way to perform a given procedure where no consensus currently exists.

Establishing Surgery's Gold Standards

Approaches such as the Surgical Metrics Project can give us macro-level data on surgical procedures and guide us to more stringent standards in our profession. We won't have all of the answers tomorrow, but this project can help us establish true procedural gold. Once it is clear how experts perform operations, those data can be used to determine how a novice can proceed to mastery.

The long-term goals will not only be to help young surgeons achieve competency, but also to facilitate moving established surgeons from competency to mastery. Even the best surgeons, for example, might execute 10 segments of a 12-step operation with finesse, but this effort can assist in achieving mastery in the remaining two.

Eventually, it may be possible to provide individualized progress reports.

Much like sports coaches, we'll be able to use recordings to demonstrate optimal techniques. Even short snippets of video can have an impact on an outcome for a patient or can be effective teaching adjuncts.

Mastering Ergonomics

One essential, but oft-overlooked component of surgery relates to ergonomics.

Surgery is a physically demanding profession, and many of us don't recognize the ways in which how we stand, how the OR table is positioned, how heavy our lead might be, and how we use devices may negatively contribute to our own physical health and career longevity. Neck, shoulder, spine, and wrist injuries, in particular, can result from poor ergonomics and can prematurely truncate a surgeon's career.

To help raise awareness about ergonomics and repetitive strain injury, the ACS will host its first Surgical Ergonomics Hands-on Clinic, which also will be in the Exhibit Hall during Clinical Congress. The clinic will offer three simulation stations, and a certified physical therapist, to teach attendees how to take better care of our health so that we can provide the best care for our patients. You can read more about the importance of ergonomics on pages 7–12.

There are, of course, many educational opportunities at Clinical Congress—both didactic and hands-on—that will help us improve the way we practice. You can view the entire program at *facs.org/clincon2022*.

As Clinical Congress draws closer, I remain excited about meeting again with friends, colleagues, and new members. If you haven't yet registered, please take advantage of pre-conference registration rates. ACS Resident and Medical Students can register for free before October 15, as can initiates. I'm excited to report that this is another record year for our newest Fellows! During Convocation on Sunday night, we will welcome 2,355 new Fellows. We also will recognize initiates from 2021 and 2020, who were part of online ceremonies during the pandemic.

As a rising tide lifts all boats, adding new minds and collective experiences to our team is a significant step in our responsibility to our patients and our profession.

If we are trusted to maintain the stringent standards of our profession, we must embrace all opportunities to learn and move forward. Clinical Congress represents one such opportunity. ♦

If you have comments or suggestions, please send them to Dr. Turner at executivedirector@facs.org.

Surgeons Face Unique Ergonomic Challenges

Matthew Fox, MSHC

HIGHLIGHTS

- Describes factors that contribute to increased prevalence of ergonomic injuries, especially among women surgeons
- Explains how a lack of awareness has allowed ergonomic challenges to go largely unsolved
- Discusses potential solutions and describes ACS Ergonomics Clinic offerings at Clinical Congress

In an era of growing awareness regarding the effects of healthcare professional well-being on quality of care, the government, hospital systems, and professional organizations, including the American College of Surgeons, have been focusing more on physician health.

Many initiatives focus on the mental and emotional aspects of well-being, as they are underrecognized prerequisites to career success and positive patient outcomes.[1,2] On top of that, surgery is a physically demanding field.

Within the occupational environment of the operating room (OR), avoiding ergonomic injuries that are an inherent risk to performing modern surgery is a necessity for a surgeon's bodily health, job satisfaction, and career longevity. Research has suggested that as many as seven in 10 surgeons in all specialties experience musculoskeletal injuries or pain;[3] within these statistics lay hidden difficulties for women surgeons.

Women surgeons face well-known barriers to career success, including the demands of their role in childbearing and starting a family and a lack of leadership representation, which have been part of the surgeon well-being conversation for some time.[4,5] But the unique ergonomic issues women surgeons confront in their work have more recently been explored in research and perspective pieces. A 2022 study, for example, found that significantly more female than male surgeons report operation-related musculoskeletal injury, and narrative articles have featured women surgeons describing their experiences with pain and injury that they suggest is the result of unmet ergonomic needs.[6,7]

These developments are prompting a need to explore women surgeons' ergonomic challenges, bring awareness to the problem, and create potential solutions.

Identifying the Issue

Like many challenges facing surgeons and surgery, the recent attention that women surgeons' ergonomic injuries are receiving is born from a variety of firsthand experiences.

"Six years ago, I had musculoskeletal issues related to operating. I had severe jaw pain extending from my neck and shoulders," said Geeta Lal, MD, FACS, professor of surgery at the University of Iowa Hospitals & Clinics in Iowa City. Her pain was neither idiopathic nor clinically ignorable; imaging and therapies clearly showed a problem. "Eventually, I was told that a big contributor for that was the forward head posture that I regularly found myself in when operating," Dr. Lal said.

Driven by her injuries, she performed research and found that most surgeons report pain after operating, and women tend to fare worse than their male counterparts. And for some surgeons, the pain and injury caused by ergonomic issues can be severe enough that they can end a career too early, which is what occurred for Talar Tejirian, MD, FACS, a retired general surgeon from Los Angeles, CA. Dr. Tejirian explained that she had radiculopathy from a herniated disc that required disc replacement surgery. "The nerve injury causing the weakness was misdiagnosed for about 7 to 8 months," she said. "It was during the time of the misdiagnosis and incorrect rehab that I developed severe pain, and by the time it was diagnosed, the nerve injury was permanent."

Though the reason for Dr. Tejirian's initial injury was multifactorial, she said that ergonomics issues were a key part of the puzzle. Her experience is a stark example of how ergonomic injury can affect a surgeon, but also illustrates what is at stake both individually and collectively. In light of the growing surgeon workforce shortage, losing a surgeon in the prime of her career represents a massive loss of time and money, undoubtedly, but also the future chance to provide patients with quality outcomes.

Instrumentation

As previously noted, surgeons experience ergonomic pain and injuries regardless of gender. But why does evidence suggest that women disproportionately suffer? The answer is multifactorial, but the interplay of biological mechanics and design factors play a part.

"Inherently, women have less muscle mass than men," Dr. Tejirian said. "And my ergonomics at a shorter height are very different than a taller, male surgeon. My use of surgical tools and OR equipment can be very different from the average man's," she said. This is an issue that can affect use of a range of devices, including laparoscopes, endoscopes, and open surgery tools like a stapler.

"When I was training, I was told I would need to learn to close an incision by firing the stapler with one hand because I would need the other hand for something else," said Jaime Bohl, MD, FACS, chief of colon and rectal surgery at the Virginia Commonwealth University (VCU) School of Medicine in Richmond. "But I physically do not have the strength to do that with a traditional stapler. I need both hands to use it," she said. This situation necessitates adapting her positioning and workflow within an operation, which Dr. Bohl says has contributed to her ongoing back pain.

Many surgical tools are not made for the hands of women, surgeons with a smaller than average stature, or individuals with less grip and arm strength in general. This part of the women's ergonomics has been known for some time, according to Dr. Lal, who noted that the largely women-led procedural specialty of obstetrics/gynecology (OB/GYN) was among the first to notice the issues. "OB/GYN was an early adopter of laparoscopy compared to other specialties. Women gynecologists were the first to sound the alarm many years ago because they were having a lot of hand and wrist issues. The laparoscopic tools they were using, and which largely are still in use, were not being designed or tested for suitability for women's hands," she said.

As Dr. Bohl said, "Having the right tools is an absolute necessity. How can you not help a surgeon do their job to best of their ability?"

Workspace

The issue of ergonomics extends to the OR environment, including the integration of operating tables and other equipment into an average-sized woman surgeon's work setting. "The patient's habitus changes for every operation, and tables often don't lower far enough for shorter women to safely operate on patients," Dr. Tejirian said, noting that the increasing obesity and body size of the average patient can exacerbate the issue. "You can get step stools, but they might not be at the right level. One stool might not be enough, while two is too much," she said. The muscular compensation required in these circumstances is physically challenging and can cause ongoing positioning pain.

Working around these ergonomic issues requires gaining an intimate knowledge of equipment that isn't necessary for an average-sized male surgeon. "As a surgeon, you learn your equipment very well, but with these ergonomic issues as a woman, I learned to come into the room and make sure the right table is there before the patient comes, because it can make or break my ability to perform the operation," she said.

"The issue of equipment being available is twofold: one is the design at the company level, and the other is the optimization," Dr. Lal said. "When these tools are being tested, are they using a wide array of surgeons, or are they only using male surgeons with a standard size 8 glove? Surgeons, both female and male, who fall in the margins outside the standard size expected to use these instruments can end up feeling excluded."

"When I was in physical therapy, I was told, 'All surgeons have problems in that area of the neck.'"

—Talar Tejirian, MD, FACS

A Silent Problem and Lack of Awareness

Although it may seem obvious that a hospital or health system would want its surgeons to have a comfortable, sustainable working environment, women surgeons often hesitate to bring their concerns to leadership.

"As a woman, you don't want to seem like a complainer," Dr. Tejirian said. "If you repeatedly ask for a tool that makes only your job easier, you don't want to be seen as 'high maintenance.' You feel like if you say to your team or administration, 'Find the laparoscopy inserts to make the case easier for me,' that people would take notice, especially when you are the only woman surgeon in the department. So, you make do with what you have, especially early in your career."

And those decisions made early in a career can have long-term consequences, according to Dr. Bohl. "As a resident, you operate in the ergonomics settings of your senior attending, and if there's a big size mismatch that affects your positioning, after 5 years of residency it can wear on you physically," she said. This situation can lead to small but repetitive injuries that a young surgeon may not notice immediately but that can add up over years and make a substantial difference in later pain or injury.

These concerns raise another issue for women surgeons. "We ask ourselves, 'Do we really belong?'" Dr. Lal said, suggesting that this is an extension of an issue with diversity, equity, and inclusion in the OR. "The OR has traditionally not been an inclusive environment, and if we want to make it an inclusive environment, we absolutely need to look at instrument design. The tools are unfavorable to an entire population of surgeons who need to contort their hands or adapt to using the instruments, which puts them at a higher risk of injury," she said.

In many ways, ergonomic challenges arise from a lack of awareness that lacks visibility from the very start of surgical training.

"When I was in physical therapy, I was told, 'All surgeons have problems in that area of the neck,'" Dr. Tejirian said, and her therapist explained that she was turning her neck in a way it was not meant to turn for extended periods and putting considerable strain on the area when she retracted heavy body parts. But this was the first she had ever heard of any ergonomic concerns that would end up cutting her career short. "Why had I never heard about this before? I was never told about it in training. Medical schools and hospitals were not training residents in ergonomics. We don't focus on it. The surgeon's health is always put as secondary, even if the answer is something as simple as properly repositioning tables and monitors in laparoscopic procedures," she said.

Indeed, the lack of focus on ergonomic issues for surgeons was the impetus for the creation of the Society for Surgical Ergonomics. Dr. Lal, the society's current president and one of its founders, became aware of the need for education and information when she participated in a Twitter chat with the Association of Women Surgeons, during which she discussed the addition of surgical ergonomics to the resident training curriculum at her institution.

"After that, I received a lot of messages saying, 'We're all experiencing pain, but no one is talking about it," Dr. Lal said. She used Twitter to create an interest group, and the society was eventually created in 2021 when a group of surgeons, human factors experts, and other stakeholders came together.

As reflected in the predominantly female composition of the society's leadership, women had a distinct interest in ergonomics, and Dr. Lal suggests many wellness programs and initiatives in surgery are often led by women because they are more apt to talk about well-being deficiencies.

Positioning for Solutions

The ergonomic challenges women surgeons face are becoming clear, and with attention now being paid to healthcare worker well-being on both the professional and larger public stages, the time is right for the field of surgery to find solutions. And in a comparable way that the reasons for women surgeons' ergonomic issues are multifactorial, so too are the potential solutions, which range from physical, to mechanical, to cultural.

Improving Physical Strength

For Dr. Tejirian, one solution comes in recognizing that while instrumentation, environment, and positioning are critical components of preventing operating injuries, a surgeon's basic physical strength cannot be neglected.

"For me, what I think surgeons need is nonnegotiable time to train their bodies to operate," Dr. Tejirian said. "You need to have your body in very good shape, since it's in a certain position for hours and you'll need to twist it." She suggests that, in the same way that surgeons usually are afforded dedicated time to address other nonoperative elements of the job, such as education or meeting with patients, there should be an expectation for dedicated time to train one's bodies. "You can maximize ergonomics, but that has its limits if it isn't supported by a strong body. And women genetically just need to work on physical strength more. We need to work out more consistently to be able to maintain that athletic status. Distributing our strength in the correct ways is part of our job," she said.

ACS Surgical Ergonomics Clinic

Regardless of a surgeon's personal experience with operating-related pain or injury and their adjustments to compensate, there is value in having an expert provide an individualized ergonomic assessment for any practicing surgeon. Such consultations can and should take place within a hospital or practice, but surgical education organizations, such as the ACS, can assist their members in understanding the importance of ergonomics.

To that end, through the work of its Surgical Ergonomics Committee, the ACS will host its first Surgical Ergonomics Hands-On Clinic for practicing surgeons and surgery residents at Clinical Congress 2022 in San Diego, CA. The clinic will feature three simulation stations with open, laparoscopic, and robotic surgery equipment to offer a hands-on learning experience in surgical ergonomics.

Ergonomic coaches will help participating surgeons learn about recently established ACS Surgical Ergonomics Recommendations and apply the recommendations in a simulated environment at each station. In addition, a certified physical therapist will share different stretching exercise protocols that can be implemented in the operating room, between cases, or at home. The clinic is the first step in an overall plan to positively address the ergonomic challenges surgeons experience, and its placement in the Exhibit Hall, among surgical device industry representatives, hopefully will spur action in creating more inclusive instrumentation that will meet the needs of women surgeons.

According to Gyusung Lee, PhD, the ACS staff leader of the Surgical Ergonomics Committee and an experienced surgical ergonomics researcher, "The committee is very interested in the topic of ergonomics for women surgeons and wants to deliver recommendations to industry partners." Ideally, bringing awareness of the issue to industry will result in an increased range of tool design that will meet the needs of surgeons who fall outside the traditional average male's size and strength.

Culture Change for Lasting Solutions

Long-lasting solutions for women surgeons will be found not in preventing or addressing an individual practitioner's operating conditions, but rather in changing the culture of healthcare institutions and the field of surgery.

"We need to address the equipment, but also the culture," Dr. Lal said. "We need to get our hospital leaders to understand that pain affects not just productivity for surgeons, but it also has a detrimental effect on their quality of life, their ability to teach, their well-being, and the quality of care they provide."

For women, part of changing the culture will come through growing the representation of women leaders, as they will be able to lend an empathetic ear to their colleagues' concerns.

"Having women surgeons in leadership is helpful because they have experience with the same pain and ergonomic issues that you do," Dr. Bohl said. On a smaller scale, she added that having a female attending

Ultimately, changing the culture that filters down from leadership will require acknowledging that despite being responsible for alleviating the suffering of their patients, the work that surgeons do can cause pain itself.

was always a welcome experience because she could show her unique adaptations to help overcome issues of managing laparoscopic tools and positioning concerns.

But some of the most important lessons in changing culture come less through finding camaraderie among other women and more through making sure your voice is being heard. "We need to be consistent and adamant when we ask for institutional support for proper tools and education. It's easy to make the ask, for leadership to say, 'We can't get that bed today, or we can't find that tool,' and then for the surgeon to make it work," Dr. Bohl said. "But the more we compromise, the more we incur the individual cost or injury."

Consistency in voicing concerns and bringing the issues of women surgeons' ergonomic pain to the attention of system leadership is critical. "One of the things that we can do is normalize that a surgeon's physical health and ergonomics are important," according to Dr. Tejirian. "We need to accommodate for all demographics of surgeons and educating staff, and it should become a given that we need to maximize the OR to make sure it is ideal for both male and female surgeons."

Ultimately, changing the culture that filters down from leadership will require acknowledging that despite being responsible for alleviating the suffering of their patients, the work that surgeons do can cause pain itself. "Pain and musculoskeletal injury are aspects of medicine that haven't been given much attention because in surgical culture, we historically haven't talked about our pain," Dr. Lal said.

Women physicians often have felt that to succeed, they cannot come across as complaining about their unique difficulties. But, as Dr. Bohl notes, by continuing to talk about their ergonomic challenges, needs, and solutions, and by focusing on reducing pain for both patients and providers, women surgeons can position themselves to change their professional culture for the better.

"Every system can react differently to suggestions for improvement. They can say, 'It's your problem,' or they can respond and recognize that it's a larger problem and help address it," she said. "Our goal is to make it so that the operating environment reduces fatigue, stress, and injury to optimize your longevity as a surgeon and optimize your patient outcomes." ♦

MATTHEW FOX is Digital Managing Editor, Division of Integrated Communications, Chicago IL.

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Reinventing the Wheel:

Mobile Cancer Screening Saves Lives, Provides Equitable Preventative Care

by Tony Peregrin

HIGHLIGHTS

- Describes the benefits of mobile cancer screening programs, including reduced mortality rates
- Summarizes data from two mobile cancer screening programs
- Highlights the patient experience, including follow-up care
- Identifies lessons learned, including seeking input from engineers and medical technology professionals

When the National Lung Screening Trial (2002–2004) revealed that low-dose computed tomography (CT) screening reduced lung cancer mortality in a landmark study published in a 2011 *New England Journal of Medicine* article, healthcare providers struggled with how to provide that screening to rural and underserved communities.[1,2]

Although research suggests that cancer screening is effective in reducing cancer mortality, particularly for lung and breast cancer patients, many patients in low-income settings lack access to adequate public transportation or are unable to take leave from work to receive preventive healthcare services typically provided at urban healthcare centers. These disparities are particularly significant when you consider that cancer is the second leading cause of death in the US, accounting for nearly 600,000 deaths annually. In 2021, an estimated 281,550 women were diagnosed with breast cancer and 14,480 with cervical cancer. In addition, 149,500 men and women were diagnosed with colorectal cancers.[3]

A report issued by the Biden Administration in May 2022 outlined the goals of its Cancer Moonshot initiative, which aligns with the American College of Surgeons Commission on Cancer's screening recommendations and includes equitable cancer screening as a key objective.[4,5] The private sector's response includes the development of new and expanded

Dr. Rob Headrick and the Breathe Easy mobile coach

mobile cancer screening programs, which typically provide services to uninsured patients and those in government-sponsored plans.[5]

"Mobile screening vehicles that bring cancer screening directly to people where they live and work are an important way of expanding the reach of lifesaving healthcare efforts," said Heidi Nelson, MD, FACS, Medical Director for ACS Cancer Programs. "We know cancer screening saves lives, and we know that not all our citizens can travel to healthcare facilities. Mobile screening helps close the gap and ensures we reach as many people as possible."

This article describes two pioneering mobile cancer screening programs: the Catholic Health Initiative (CHI) Memorial Hospital's Breathe Easy program in Chattanooga, TN, which is acknowledged in the Cancer Moonshot initiative's "Private Sector Fact Sheet," and the Bassett Health Network Cancer Services Program mobile coach in Cooperstown, NY, one of the first traveling screening initiatives in the US.

CHI Memorial Hospital's Breathe Easy Program

The Breathe Easy Mobile Lung Screening bus took to the streets in 2018 and serves 14 counties in Tennessee, eight counties in northern Georgia, and two counties in northeast Alabama.[6] "In our state of Tennessee, we have one person dying every 2 hours of lung cancer," said Rob Headrick, MD, MBA, FACS, chief of thoracic surgery at CHI Memorial Hospital.

"Fortunately, there are steps that you can take, beginning with removing the stigma around lung cancer and offering quick and accessible screening to those in need." In fact, Dr. Headrick's father, also a well-known thoracic surgeon and a smoker, refused to be x-rayed because of the accepted medical assertion at the time that diagnosing lung cancer early had no benefit. "What they didn't understand at that point in time is that it still takes a pretty large tumor to be seen on a chest x-ray," said Dr. Headrick.

"One of the great things about medicine is that there's no finish line, there are always new things to discover. One of the things the National Lung Screening Trial showed was that if you find cancer early, not through a chest x-ray, but through a CT scan, it does change the prognosis," he said. "And the treatment went from something complicated, expensive, and terrible to something that was relatively simple—simple meaning we were already in the minimally invasive world of surgery."

CHI Memorial's Breathe Easy mobile lung bus allows healthcare practitioners to take low-dose CT lung screening to areas where at-risk individuals may have limited access to this scan otherwise. Individuals who are at highest risk for lung cancer and are ideal candidates for low-dose CT screening include:

- Current or former smokers
- People ages 50–80 who have smoked for 20 years (one pack per day or more)
- People who quit smoking within the last 15 years

"I thought that after the National Lung Screening Trial, I was going to be inundated with people just jumping into my office, saying 'Give me this scan!,' and yet nobody showed up," said Dr. Headrick. "Here's the problem—our healthcare system doesn't educate

The BHN mobile coach

people as to why they should engage in their healthcare. I realized that I have to go where the people are and that I have to make healthcare simple." In fact, the project became known as "Breathe Easy" to convey Dr. Headrick and his team's goal of reassuring patients through the screening process by educating them about optimal patient care.

The initial mobile bus prototype included a portable CT scanner, independent power, and climate control among other features, and cost $650,000 to build. Funding to build the vehicle, which included a Winnebago shell and freightliner chassis, was donated through the CHI Memorial Foundation, with additional funding provided by CHI Memorial, Medical Coaches, and Siemens.

Researchers examined patient data from the 10 months that the prototype bus was in operation in 2018. According to a study published in *The Annals of Thoracic Surgery* in 2020, the Breathe Easy coach traveled to 104 sites and screened 548 patients.[7] For these patients, the mean age was 62 years old, with a mean smoking habit of 41 years. Significant pulmonary findings were seen in 51 patients. Five lung cancers were identified—four of them at an early stage. In addition, nonpulmonary results also were found in 152 of the individuals screened, with the most common being moderate-to-severe coronary artery disease in 101 patients.[7]

Bassett Health Network Cancer Services Program Mobile Coach

Since 2008, Bassett Healthcare Network (BHN) mobile coach has provided tens of thousands of breast, cervical, and colorectal mobile screenings and referred hundreds of patients for additional care, according to Alfred Tinger, MD, FACRO, medical director of Bassett Cancer Institute in Cooperstown, NY, and Mark Kirkby, supervisor for Cancer Services Programs of the Central Region. The recreation vehicle (RV)-type medical coach, through the fundraising efforts of the Friends of Bassett and other leading donors, has traveled the 5,600 miles that Bassett serves, screening the uninsured and underinsured in Otsego, Oneida, Delaware, Chenango, Madison, Herkimer, Schoharie, Fulton, and Montgomery counties.[8,9]

"This is an imperative project for this area because patients have a hard time getting to screening," said Dr. Tinger, who became medical director in 2019. "The one thing about the mobile coach that a lot of people don't understand is that patients would rather go there than to a clinic because they view it as a one-stop shop. We eliminate driving for patients. We eliminate parking issues. We eliminate them having to use sick time or personal time to go to appointments because we go to their community, and we pull up on their doorstep," added Kirkby.

In 2017, after more than a year off the road, the Bassett program replaced its original vehicle with a new-generation RV-type mobile coach complete with state-of-the art diagnostic technology, including 3-D mammography—an imaging test that combines multiple breast x-rays to create a complete image of the breast.[10] The new coach, built by Medical Coaches, had a price tag of approximately $1 million paid for by fundraising efforts of the Friends of Bassett, New York Central Mutual Fire Insurance Company, and other donors. "New York state provides funding to screen patients for free, but Bassett pays to maintain the coach," said Dr. Tinger. Maintaining Bassett's medical coach costs approximately $1.1 million per year.

BHN mobile coach: The 3-D mammography machine

Breathe Easy mobile coach: The screening process begins in the registration area where patients complete paperwork and prepare for the scan

In 2018, a year after the launch of the new mobile coach, 1,428 mammograms were performed on the vehicle. In 2019, 1,375 mammograms were performed, with 1,202 performed in 2020, and 1,195 mammograms performed in 2021. From 2018 to July 2022, 219 cervical screenings were performed via the coach, and 237 colorectal screenings (fecal immunochemical tests, also known as stool screening kits, as well as colonoscopies) were also provided.

The Patient Experience

What happens if a patient has an abnormal result via a mobile screening? How are the results and follow-up treatment options presented to the patient in such a way that they feel informed and educated on next steps?

"Typically, the patient receives results within 24 to 48 hours. It's a fairly quick turnaround," said Kirby. "There are some days where they actually have results within a few hours. We prefer reaching out to patients with phone calls for personal updates, rather than a text or an email."

"We have a nurse navigator who works on the coach and is responsible for speaking with the patients; if anything is positive, the nurse arranges for further workup with biopsy or referrals to specialists," added Dr. Tinger.

In the Breathe Easy program, "Patients will get a phone call that day if there's a positive finding, and we'll try to talk them through it, so they're not scared," Dr. Headrick said. "If we find something on somebody today, they're going to be offered a same-day appointment to be seen in the office." If a patient happens to live closer to another medical center, Dr. Headrick's team contacts that facility to expedite the follow-up appointment.

As for contacting patients with normal scan results, CHI Memorial Hospital's Breathe Easy program partnered with Rhinogram, a cloud-based virtual care platform that connects clinicians and patients with text and video messaging in real time, to send text messages that are compliant with the Health Insurance Portability and Accountability Act's (HIPAA) privacy rules. "Nobody wants to answer their phone if they see a hospital ID come across with all the spam calls," explained Dr. Headrick. "Everybody views a text message in which we give them the basic message of, 'You don't have cancer. Here's your calcium score. Click on this link for an in-depth discussion.'"

Harnessing the power of technology, like HIPAA-compliant text messaging, is one of the most cost-effective ways to scale-up mobile cancer screening capabilities. "If we're going to make headway with our program, we've got to go from scanning 3,000 people to 30,000 people. And when you do that, you can't afford the salaries and benefits that go along with adding a call center of individuals that are relaying normal scan results," Dr. Headrick said.

Dr. Headrick's goal of expanding the Breath Easy program—they are adding a second bus in January 2023—led to a request from the White House to participate in the Cancer Moonshot program in May 2022. "That was probably the biggest honor I've received in all of my career," said Dr. Headrick. "When you are sitting there with the highest office of our government that is recognizing what you've put together; well, it really energized me. It was a tremendous honor for our community and all of the people who believed in this project."

The patient's experience with mobile cancer screening services often is tethered to social determinants of health and the obstacles certain communities face in accessing preventive care.

Replicating the Breath Easy program model for other areas of the country, including fundraising and developing partnerships with manufacturers and community stakeholders, is a key component of the program's involvement in the Cancer Moonshot initiative, according to Dr. Headrick.

SDOH

The patient's experience with mobile cancer screening services often is tethered to social determinants of health (SDOH) and the obstacles certain communities face in accessing preventive care.

The Healthy People 2030 report defines SDOH as "the conditions in the environments where people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks."[11] More specifically, barriers to cancer screening can include unreliable or inaccessible transportation, as noted earlier, as well as insufficient housing, food insecurity, and language and cultural barriers.

"The Bassett Research Institute is well-known nationally for studying SDOH and has lots of data on these issues," said Dr. Tinger. "Most of our barriers are related to socioeconomic or cultural factors."

"Let me give you a quick example," added Kirkby. "Our area is heavy populated with the Amish community. The Amish, who typically do not have health insurance, are hesitant to receive preventive healthcare services, such as cancer screenings, due to cost and because they tend to reject any assistance from the state of New York. When we take the time to explain the benefits of early cancer detection, along with the fact that this is a state-funded program held by Bassett and that Bassett is the entity conducting the screenings, these facts seem to make members of this community comfortable enough to get their mobile cancer screenings through us."

Dr. Headrick noted that some challenges inherent to the healthcare system may discourage some underrepresented populations from engaging with providers of care. "The bus allows us to bring cancer screening to the community, so that when you help patients overcome their fear and uncertainties, we are able to scan them right then and there. You can't say, 'Show up next week, drive an hour somewhere else.' They're not going to do it."

In an article published in the June issue of the *Bulletin,* "The Role of Social Determinants of Health on Cancer Screening," authors Fedra Fallahian, MD, Dr. Nelson, and Susan Pories, MD, FACS, issued a call to action for physicians to educate eligible patients on how to access preventive services covered by Medicaid and Medicare and endorse policies and legislation that increase access to care.[12]

COVID-19

More than one-third of adults failed to receive recommended cancer screening in the US during the COVID-19 pandemic, according to the National Comprehensive Cancer Network.[13] More specifically, a national survey published in *JAMA Network Open* found that "between 2018 and 2020, past-year breast and cervical cancer screening prevalence declined by 6% and 11%, respectively."[14] This deficit in cancer screening could result in cancers diagnosed at a more advanced stage and an increase in cancer-related mortality.[15]

Dr. Headrick was invited to the White House in May 2022 to participate in President Biden's renewed Cancer Moonshot program

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continued on next page

While state-specific regulations for travel and indoor business varied widely during the height of the pandemic, resulting in confusion and hesitancy for some patients regarding in-person medical appointments, the Breathe Easy Mobile Lung Screening bus program realized an opportunity to provide safe preventive healthcare.[1]

"When the country shut down, we were determined to continue to be there for the community," said Dr. Headrick. Individuals interested in receiving a cancer screening were invited to drive up to the bus, with a limit of one patient on the vehicle per visit. The Breathe Easy Mobile Lung Screening bus, which was originally outfitted with an air filtration system, was thoroughly cleaned between patient screenings. "I knew we could keep the bus a safe environment. I think we may have been one of the only screening programs that didn't shut down in the country," he said. "Last year, at a time when the world was still partially shut down due to the pandemic, we screened 1,600 people on the bus. Our goal this year is 3,000 people."

While the Bassett Healthcare Network mobile coach was in operation for only 4 months in 2020 (January to April) because of COVID-19 safety protocols, the program offered a notable number of screenings during that brief period. More than 1,200 patients were seen on the mobile coach in more than 24 towns in six counties.

Lessons Learned

According to Drs. Headrick and Tinger, best practices for developing a mobile cancer screening unit could include:

- *Equipment:* Collaborate with engineers and medical technology professionals and obtain clinical input to overcome potential operational challenges. For example, some mobile screening programs require a CT scanner

"Last year, at a time when the world was still partially shut down due to the pandemic, we screened 1,600 people on the bus. Our goal this year is 3,000 people."

– Rob Headrick, MD, MBA, FACS

that can function in a climate-controlled vehicle traveling hundreds of miles over uneven roadways and rugged terrain.

- *Driver:* Partner with a driver who has a commercial driver's license, if appropriate. For example, the Breathe Easy bus has a 27,500 pounds gross vehicle weight and requires a driver with this type of training.

- *Staff:* Select healthcare professionals who are passionate about cancer screening and are outgoing and comfortable functioning in this setting due to the enhanced patient education component inherent to these mobile cancer screening programs.

- *Radius:* Ensure optimal patient follow-up by creating a plan for service that will entail a travel time of no longer than 1.5 hours.

The models established by the CHI Memorial Hospital's Breathe Easy Program and the Bassett Health Network Cancer Services Program mobile coach—and others like them—suggest that traveling cancer screening initiatives diagnose some cancers earlier leading to reduced mortality rates. In fact, numerous established and newly launched traveling cancer screening programs across the US are saving lives by providing increased access to preventive care, particularly for rural and uninsured individuals.

"I hate going to the doctor just as much as anybody else does because it typically takes half a day," Dr. Headrick said. "If we can offer a 10-minute visit through a mobile cancer screening program, people will see real value in what we are providing. The question is—how do we scale this up? We need to consider how this format will work in other regions of the country." ♦

TONY PEREGRIN is Senior Editor, Division of Integrated Communications, Chicago IL.

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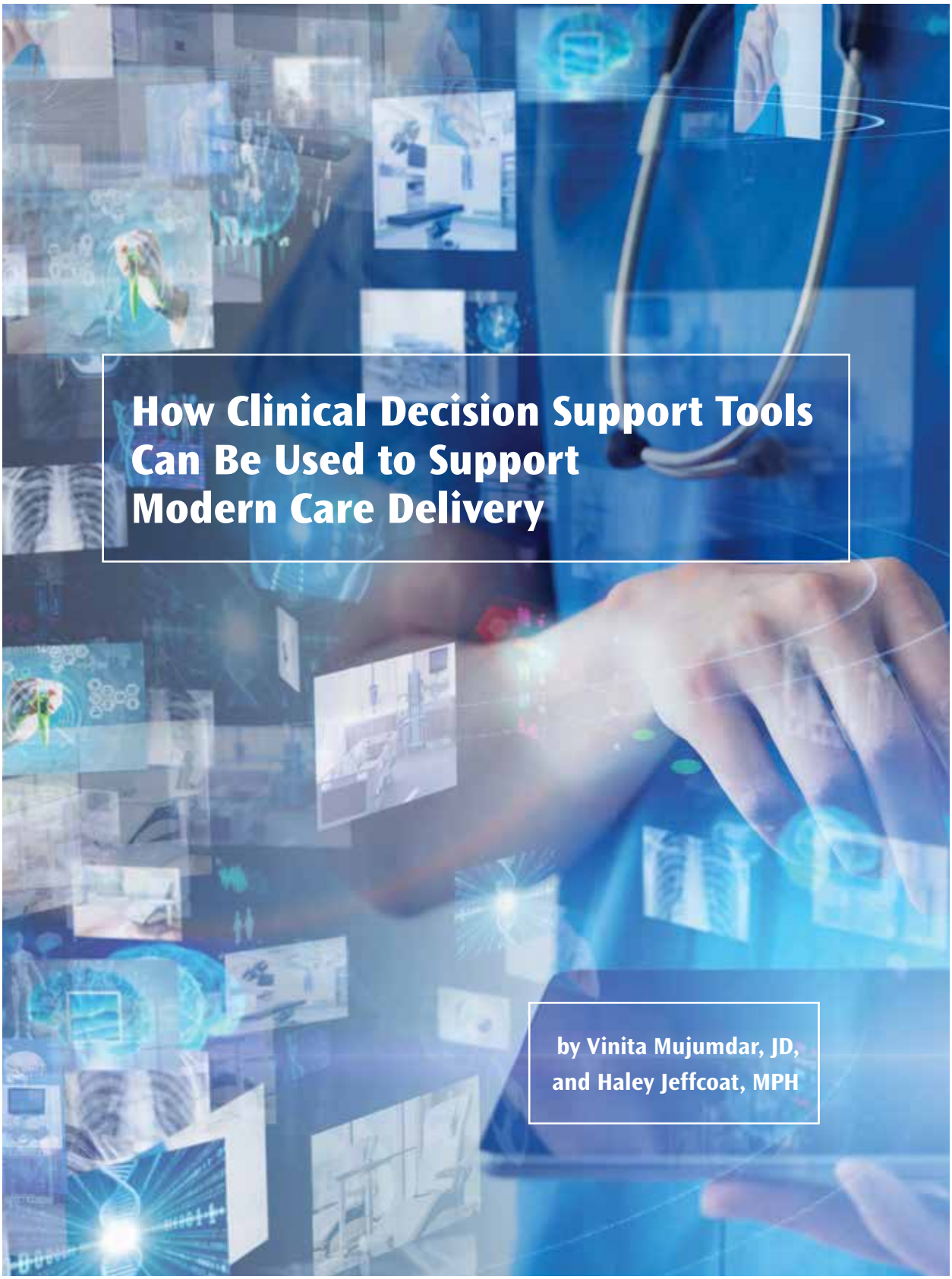
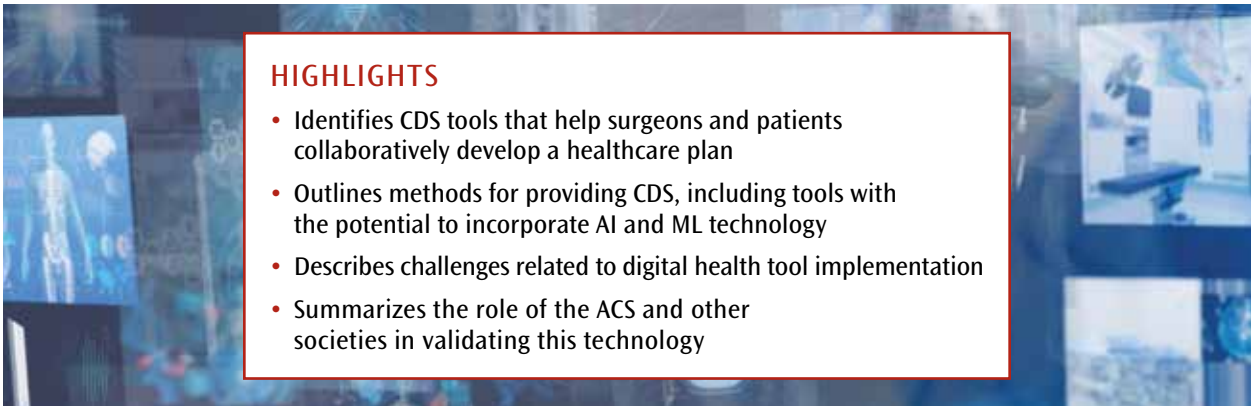


How Clinical Decision Support Tools Can Be Used to Support Modern Care Delivery

by Vinita Mujumdar, JD, and Haley Jeffcoat, MPH



HIGHLIGHTS

- Identifies CDS tools that help surgeons and patients collaboratively develop a healthcare plan
- Outlines methods for providing CDS, including tools with the potential to incorporate AI and ML technology
- Describes challenges related to digital health tool implementation
- Summarizes the role of the ACS and other societies in validating this technology

Surgeons are dedicated to providing optimal care for and working with their patients to achieve that goal. Fortunately, technology is making it more possible for surgeons and patients to partner in the decision-making process.

Hypothetical example

A 77-year-old patient visits a surgeon after cancerous polyps were identified during a routine colonoscopy. The patient has been nervous about the visit, especially because she witnessed her father lose his battle with colon cancer 20 years earlier. However, in recent decades new approaches to clinical decision-making and advances in care have emerged since her father died.

This patient wants to better understand her treatment and the risks involved. In addition to advancements in cancer care, innovations in healthcare information systems, clinical decision support (CDS), and other digital health tools allow physicians more access to patient information, resulting in more informed decision-making, better tracking, and improved communication with patients and across the care team.

The surgeon enters the patient's exam room, with a tablet in hand and accesses the patient's electronic health record (EHR), showing her personal medical history, comorbidities, family history, and all of the recent physician notes, scans, and lab results related to her diagnosis. As the surgeon discusses potential diagnoses and treatment plans with her, the patient begins to ask many questions about the proposed surgical intervention, noticeably becoming increasingly nervous about the risk of a major operation at her age.

Aware of the patient's discomfort, the surgeon opens an application on the tablet that calculates a patient's personalized risk for surgical complications. The application or web service asks for permission to upload the patient's information, such as name, date of birth, patient identification number, comorbidity parameters, and the Current Procedural Terminology (CPT)* code for the planned procedure.

With this information, the application auto-populates the required fields in the calculator from data in her medical record and quickly displays projections of the patient's specific 30-day risks and outcomes of the procedure. The report reveals the patient's risk for complications and shows that she has low-to-moderate risks. The surgeon shares the outputs from the risk calculator with the patient, engaging her in reaching an informed decision regarding the recommended care.

Armed with clear information about potential risks for surgery, the patient can better appreciate data-driven decisions about her care and leaves the visit feeling comfortable with the treatment plan.

Patients are increasingly more aware of their options and anticipated outcomes and expect to be more informed so they can participate in their healthcare decisions. In this instance, the patient is appreciative and finds her surgeon more trustworthy after having had a detailed discussion about her risks. This scenario describes just one of many in which CDS tools can be used to support patients and physicians as they navigate the complexities of receiving and delivering high-quality care.

This article describes CDS tools, explains why hospitals should consider making CDS tools more accessible to healthcare professionals, and outlines potential barriers regarding digital health tools. It also looks at the role the American College of Surgeons (ACS) and other professional societies could play in verifying the utility of this technology.

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CDS tools have the potential to support surgeons' delivery of high-quality care and reduce physician burden, and, therefore, physician burnout.

Evolution of CDS

CDS initially was limited to medication reminders and drug interactions found in the pharmacy sections of the EHR. Although these functionalities have proven to be important to both primary care and medical specialties, further expansion of CDS extends beyond these basic functions. CDS can better facilitate order sets, facilitate documentation, display relevant knowledge from expert analysis, lay out practice guidelines, and track patient conformance with protocols. These digital tools could also assist with assessing criteria for inclusion in clinical trials or other types of research.

Healthcare delivery often is a complex journey, involving multiple data points and care teams that add to decisions about diagnosis, treatment, and the care plans. Digital tools such as platform-based web services and knowledge-enabled capabilities in a patient, nurse, or physician workflow hold great promise to support managing the various aspects of contemporary healthcare delivery.* Modern-day healthcare involves understanding the disease and clinical pathophysiological process of the individual patient and applying clinical knowledge across the lifecycle of a condition as well as the appropriate treatment or management regimen.

It is possible to think of medical conditions with the lifecycle beginning with disease prevention, early detection, timely diagnosis, treatment, management of those conditions, and survivorship with long-term surveillance. Across the various phases of the lifecycle are large swaths of knowledge that are best co-managed by the patient and the entire care team. Keeping all the clinical team members informed is critical to success, which might be defined by meeting patient goals for care or achieving positive patient outcomes, but this also can be challenging due to the complexities of modern care. Digital web services, such as apps using CDS tools, already address many of the complexities of today's healthcare system and will continue to grow in applicability. These tools are limited in scope only by developers' and users' imaginations.

The power of these tools comes from the potential to draw upon a variety of data sources and incorporation of evidence-based guidelines or advanced algorithms and deliver them within a workflow that is aligned to the surgeon's mental models and supports their cognitive process.

CDS tools also have the potential to support surgeons' delivery of high-quality care and reduce physician burden, and, therefore, physician burnout. Specifically, CDS tools can decrease administrative and documentation burden, relieve cognitive burdens, synthesize and share treatment options, provide input from clinical guidelines, and employ artificial intelligence (AI), machine learning (ML), and predictive analytics for patient outcomes and price transparency.

Importantly, CDS should never replace a physician's clinical judgment; rather, the goal of these and other digital health tools is to enhance physicians' knowledge and augment their cognitive efforts. Care is highly personalized and requires a physician-patient interface where the medical knowledge is contextualized and personalized in a trusted manner for each patient. This point cannot be overemphasized. It is important for physicians to leverage the content and use it within the context of applied surgical science with their patient.

Types of CDS Tools and Methods of Providing CDS

CDS is defined as a process for enhancing health-related decisions and actions with pertinent, organized clinical knowledge and patient information to improve the delivery of healthcare services.† A variety of CDS tools and mechanisms are available, and these options continue to expand with the advancement of new technology and increased interoperability.

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TABLE 1. METHODS OF PROVIDING CDS AND COGNITIVE SUPPORT

Type	Description
Medication dosing support	Inform clinician about medication dose adjustment, formulary checking, dose checking, default doses, and indication-based ordering
Order facilitator	Includes order sentences, subsequent or corollary orders, consultant-recommended orders, indication-based ordering, and rule-based order sets
Point-of-care alerts/ reminders	Prompts clinicians about how prescription medications interact with other drugs, the patient's medical condition, and allergies; reminds clinicians to assess specific care items; notifies clinicians about critical laboratory values or high-risk states
Relevant information display	Ensures that clinicians have up-to-date and necessary patient data to make decisions in providing care to the patient, such as showing recent lab values when ordering medication
Expert systems	Apply advanced logic or computational methods to assist clinicians in ordering, diagnosing, treating, and interpreting data elements; may be applied across CDS mechanisms
Workflow support	Includes order routing, registry functions, medication reconciliation, automatic order termination, order approvals, free-text order parsing, documentation aids, and activity-based summary views
Summary views	Includes a composition of all the pertinent or relevant patient-level information such as the conditions, complications, procedures, labs, findings, diagnostics, risk/severity scores, active orders, clinical activities, potential next steps (for example, orders) and compliance with/ adherence to guideline recommendations, and more that are then filtered, sorted, and/ or oriented to a given condition, procedure, or workflow activity (for example, rounding)
Smart forms and documentation templates	Can facilitate documentation-based CDS by enabling a multiproblem visit note while capturing coded information and providing sophisticated decision support
Timeline views	Shows a chronological display of the patient's clinical events and can compare with other patients
Interaction models	Information can be displayed similarly to a site map for a web page to support the conceptual models of its target users. Used in apps to align the user interface to clinician mental models and in-app workflows to cognitive processes and clinical activities

Some CDS tools already are embedded in EHR systems, so surgeons already could be using elements of CDS in their practice without knowing it.

Table 1, this page, offers ways to provide CDS for care of the surgical patient.[‡] Many of the CDS methods listed in the table also could incorporate AI and ML technology, including computable models of clinical guidelines and pathways, further enabling the capability of these technologies. In addition, many CDS methods can be applied across different types of platforms beyond the EHR.

Benefits of Using CDS in Surgical Practice

As the capabilities of CDS continue to expand and more practices adopt CDS tools, surgeons likely will experience the benefits of these tools if they are implemented thoughtfully. Implementation of CDS tools has been associated with more efficient care processes, facilitation of shared decision-making with patients, improvements in patient outcomes, cost savings, and more.[§] The surgeon can leverage CDS at the point of care and during postoperative care assessments to evaluate performance improvements and facilitate communication with patients. In this article, the focus is on improvements in care processes, improved clinical outcomes, reduced cognitive burden, reduced administrative burden, and cost/resource savings that are possible with the use of CDS tools.

[‡]McCoy AB, Melton GB, Wright A, Sittig DF. Clinical decision support for colon and rectal surgery: An overview. *Clin Colon Rectal Surg.* 2013 Mar;26(1):23-30.

[§]Tcheng JE, Bakken S, Bates DW, Bonner III H, Gandhi TK, Josephs M, K. Kawamoto K, Lomotan EA, Mackay E, Middleton B, Teich JM, Weingarten S, Hamilton Lopez M, editors. Optimizing Strategies for Clinical Decision Support: Summary of a Meeting Series. Washington, DC: National Academy of Medicine; 2017.

By capturing patients' experiences and maintaining open lines of communication, patients are empowered to stay engaged in their care and physicians can better understand how to provide value and meet patients' goals.

Improved Care Processes and Patient Experience

CDS systems can contribute to improvements in care processes, such as reduction in the variation in care delivery, duplication of tests and services, and timely and reliable ordering of necessary tests and preventive services, thereby enabling physicians to offer more targeted information to patients and caregivers based on their needs and what they value. By layering evidence-based best practices on top of unique patient information found in EHRs, CDS tools can present the clinician with knowledge that is tailored to the patient to inform more personalized care decisions to engage patients and caregivers throughout their care journey. The tools also can help close gaps across the care model by guiding the physician through clinical pathways and recommending evidence-based processes to allow for more reliable, valid, and timely quality measurement, and drive more impactful and rapid quality improvement (QI) cycles. With the greater availability of more reliable and valid digital data, registries can interoperate with clinical information systems and integrate more advanced capabilities (data collection, real-time comparison, AI/ML).

As CDS tools continue to advance, opportunities to move toward a learning health system arise. In a learning health system, clinicians can learn from each other and from the data. The data can be applied to inform clinical pathways and practice, which all can be facilitated by CDS tools. In addition, the advanced capabilities will allow traditional evidence-based medicine guidelines to integrate customized medical recommendations and advanced analytics, such as AI and ML, to give physicians a real-world view of a specific patient. By streamlining how the information is presented to physicians and putting the right information in their hands at the right time throughout the care cycle, physicians' time can shift back to the patient and away from their workstations.[‡]

Improved Patient Outcomes

CDS tools can help drive improvement in patient outcomes in several ways. As clinicians move through their clinical workflow, CDS software can integrate alerts and notifications to keep the clinical team informed on the latest clinical guidelines, avoid negative drug interactions, unnecessary tests, medication errors, and other adverse clinical events. By implementing CDS, physicians and healthcare institutions may notice shorter length of stays following procedures, reduced complication and morbidity from complications, improved recovery time, and more. With the increase in data and personalized patient information offered by the CDS tools, clinicians will be able to identify potential complications and intervene earlier. The ability to track patient data, compliance with standards of care, and the status of quality control metrics in one system strengthens QI cycles.

CDS tools also can provide additional pathways of communication between the patient and the care team. This could include functionalities that prompt patients to provide feedback and facilitate how the clinical team provides resources to patients. By capturing patients' experiences and maintaining open lines of communication, patients are empowered to stay engaged in their care and physicians can better understand how to provide value and meet patients' goals. Shared decision-making is critical to delivering high-quality patient-centered care.

Reduced Cognitive Burden

Physicians are responsible for an increasing number of cognitive and administrative tasks. Physicians now have access to large amounts of data from many sources. While powerful, this influx of data and tasks also can contribute to cognitive burden and physician burnout. By enabling physicians to easily access the relevant information or knowledge at specific decision points within the care cycle, their cognitive load and administrative burden will decrease. By aligning CDS algorithms with mental models (for example, clinicians' existing knowledge about diseases, procedures, organ systems, and more) and clinical workflows informed by up-to-date clinical best practices and guidelines, CDS systems can help physicians organize activities and tasks and provide

specific information and inferences needed to optimally complete each task.

Reduced Costs, Waste, and Administrative Burden

Duplicative services, unnecessary testing, adverse patient outcomes, and variations and gaps in the physician workflow can pose significant financial strain on healthcare institutions and take time away from direct patient care. Although a practice's initial investment in CDS integration may be significant, proper use of the tool can contribute to fewer costly adverse events, redundant services, and more.[‡]

Some CDS tools also can assist with burdensome and timely documentation tasks. For example, based on the data the physician enters into the EHR, the tool can present billing codes and modifiers for surgeons as they work through the care cycle, resulting in more accurate and appropriate billing. To support registry and QI program efforts, both the clinical team and nurse abstractors can use CDS to better facilitate and accelerate data abstraction and documentation. By decreasing adverse clinical events and shortening the time physician and their extenders spend on administrative activities, physician practices and health systems could experience reduced costs.

Challenges Associated with CDS Implementation

Introducing advanced technology into care delivery is presenting a paradigm shift. Although CDS implementation has many benefits, challenges and disruptions do occur when undergoing a major change. Barriers to CDS implementation span from the need for physician trust in the tools to alignment of workflows with current EHR systems, regulation and governance of data and knowledge, liability concerns, and more.

Physician Trust

When exploring the use of any new technology, a common barrier can be users' lack of trust in the tool. Physicians are likely to have concerns about implications for patient safety, and it can take time for users to become comfortable applying the CDS outputs to inform patient care. To enhance trust in using the tool, the following considerations are essential: transparency, ease of use, proof of validation, reliability, data quality, opportunities for feedback, and adequate regulation.

Physicians also may have concerns about the data and algorithms used in tools that incorporate AI and ML capabilities. With these advanced tools, the need for trusted and complete data sources is even more important, and ensuring the algorithms and data are properly validated is crucial. If the tool is not developed and trained with data that are representative of the patient population the physicians serve, the data outputs could be inaccurate or biased. To lower the risk of bias, the use of trusted and complete data sources in development and testing stages is extremely important.

Alignment with Existing Workflows and Information Systems

Aligning new technology with existing systems, such as EHRs, and accessing data within these systems can be difficult and costly, which can contribute to slow uptake of tools like CDS. To minimize these barriers, it will be necessary to apply components of systems engineering to effectively incorporate CDS methods and tools into clinicians' workflows and demonstrate the value of the tool. This process should include evaluations of existing processes before taking steps to automate them with CDS or other knowledge-based digital health tools.

Automating a poor process will only exacerbate gaps in care, inefficiencies, and risk of error. By completing these assessments, institutions can identify problems or inefficiencies in their systems and implement CDS tools to update and redesign workflows that support and augment optimal care. Allotting time for user training is crucial to optimize the tool's functionalities and reduce user errors and disruptions in workflow. Properly training users so they are comfortable with the technology and feel confident about the outputs will go a long way toward building provider trust.

CDS tools should be integrated in the clinician's workflow to decrease burden, not add to it.

Regulation and Liability

Healthcare institutions should have their own governance and structure for CDS and digital health tools, including pathways for user feedback and timely responses to feedback as physicians have concerns or encounter issues. Liability risks and uncertainty about who is responsible for issues with CDS algorithms, outputs, or user errors can hinder implementation of CDS systems. Before implementing these systems, institutions should be confident in the quality of the tool and its capabilities and thoroughly understand vendor contracts. Contracts with hold harmless clauses, in which vendors require that purchasers shift responsibility to the user, pose high liability risks for physicians; such provisions should be removed.

Key Takeaways to Support and Advance the Use of CDS

CDS tools should be integrated in the clinician's workflow to decrease burden, not add to it. The following describe important components regarding CDS implementation:

- CDS can support delivering value to patients through improvements in shared decision-making and patient goal identification
- CDS should be tailored to the particular clinical environment
- CDS should support physician decision-making and reduce cognitive load
- CDS tools should be properly integrated with existing clinical information systems
- Healthcare systems can help promote the use of CDS and build trust in new technologies
- The cost savings from CDS integration can offset the initial investment to implement these systems

The ACS's Role

The ACS and other specialty societies have several important functions with regard to web services and CDS. Primarily, surgeons and their patients must evaluate the technology to ensure it represents the evidence and the clinical algorithms used in CDS. For example, the risk calculator mentioned earlier in this article must have governance over maintenance of the risk formula and remain up to date. The technology used to implement the algorithm must faithfully aggregate the right data elements for the risk calculation. Finally, the implementation at the point of care must be affordable and sustainable so that cloud implementations or platforms do not create a costly barrier to entry for digital web services by charging exorbitant user fees (known as "toll-gating the applications").

Algorithms, applied medical science, and knowledge artifacts must be accurate and meaningful to physicians. Specialty societies can help ensure that the clinical pathways, data, and guidance are up to date and align with clinical best practices. If the ACS and other professional societies review and validate a tool, users can be more confident that it is a safe investment. ♦

Acknowledgment

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The COT at 100:

Emergency Medical Services and Trauma Systems

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HIGHLIGHTS

- Summarizes key turning points in the evolution of the EMS and trauma systems
- Identifies the roles of ACS COT leaders in developing modern EMS and trauma processes
- Highlights future goals, including advancing a NTEPS at the federal level

As the American College of Surgeons Committee on Trauma (ACS COT) celebrates 100 years of service, milestones of the systems of care that have been built over the past century have been acknowledged and celebrated. Perhaps the most notable milestone is the evolution of emergency medical services (EMS) and the creation of the trauma system itself. Herein we explore the history and impact of each.

EMS

The ACS COT has had a significant impact on the evolution of modern EMS throughout the committee's history. George G. Davis, MD, FACS, presented a lecture on Transportation of the Injured at the Conference of Traumatic Surgery Symposium during the 1929 ACS Clinical Congress, highlighting the importance of stabilizing fractures, using tourniquets, and avoiding delays. The EMS Committee, which first started as the Subcommittee on the Ambulance Equipment in the Emergency Treatment of Fractures in 1931, chaired by Robert H. Kennedy, MD, FACS, has grown from a small group to a committee of more than 40 members and organizational liaisons.

The EMS Committee has consistently emphasized the importance of the trauma continuum of care that begins when and where injury occurs. From educating first responders through the Prehospital Trauma Life Support (PHTLS) Course, to forming a seminal relationship with the National Association of Emergency Medical Technicians (NAEMT), to the development of the STOP THE BLEED® program that emphasizes the role of the public as immediate responders, the EMS Committee has had, and will continue to have, a profound impact on saving lives around the globe.

Although modern EMS had its major evolution in the 1960s, the COT has always had an interest in transporting injured patients. Robert T. Findlay, MD, FACS, published a review in 1931, "First Aid for Fractures: Methods and Equipment for the Treatment of All Fractures at the Site of Accident and on the Ambulance during Transportation to the Hospital" in *The Journal of Bone & Joint Surgery*. In the June 1933 issue of the *Bulletin of the American College of Surgeons*, Dr. Kennedy published the article "Transportation of the Injured," discussing transportation considerations and splinting techniques. In 1936, a report from the Subcommittee on the Transportation of Fractures recommended basic equipment on ambulances, including splinting devices and proper training for the responder. This committee became the Subcommittee on the Transportation of the Injured in 1949 and continued to call for the transition of the ambulance attendant role from a transporter to a caregiver.

The growth of the automobile industry and the subsequent highway system underscored the need for organized civilian EMS systems. In fact, military personnel returning from World War II were quick to note that emergency care was often better on a remote battlefield than at an intersection down the street. The COT was pivotal in highlighting the need for organized civilian EMS systems for both the government and public. Members of the COT helped publish "Let Them Lie, A Manual of First Aid for the Motorist" in 1955 to educate the public about the importance of avoiding significant movement of motor vehicle crash victims. In 1956, the ACS COT developed and proposed to the US Congress the concept of an emergency medical care system serving travelers on federal highways.

In the 1960s, there was no unified way to contact EMS providers, no standards on ambulances or attendant training, and few functioning EMS agencies at that time. As Chair of the COT Subcommittee on Transportation of the Injured (1965–1974)


Dr. Robert Kennedy


Dr. J.D. Farrington


Dr. Oscar Hampton Jr.


Dr. Norman McSwain Jr.

Joseph D. Farrington, MD, FACS, published "Death in a Ditch" in the June 1967 issue of the *6*

. This article was one of the first to highlight, on a national level, the training required for ambulance attendants. It also provided the first ambulance equipment list outlining the minimum equipment necessary for emergency vehicles or ambulances.

In 1966, two notable events occurred that started what Dr. Farrington referred to as the "7 Years' War." *Accidental Death and Disability, the Neglected Disease of Modern Society,* published by the National Academy of Sciences National Research Council, assessed the mortality and injury rate among civilians at a time when the number of people killed on the nation's roadways was near epidemic proportions. This report led to passage of the National Highway Safety Act the same year.

After 1966, the COT and the Subcommittee on Transportation of the Injured played a key role in changing the face of EMS. The National Highway Safety Act had been enacted without built-in guidelines for the proposed action. A minimal equipment list for ambulances, originally created by Oscar P. Hampton Jr., MD, FACS (COT Chair 1964–1968), in 1961, was revised in 1966, although fewer than one-third of the ambulances were equipped as recommended at that time. To this day, the EMS Committee continues to actively support the revision of the list.

The Airlie Conference on Emergency Medical Services, a joint venture of the COT and American Academy of Orthopaedic Surgeons (AAOS) Committee on Injuries, occurred in 1969. A total of 53 representatives of American medicine and government participated in this meeting, during which they developed guidelines for ambulance services, personnel and education, and emergency facilities. In 1969, ambulance design criteria were developed, ensuring that care could be rendered to a patient in the back of an ambulance.

To ensure the ambulance attendant was professionally trained, the COT collaborated with other organizations to develop training criteria. In 1966, the ACS published a pocket manual, *Emergency Care of the Sick and Injured*. Two years later, the National Academy of Sciences Research Council released *Training of Ambulance Personnel and Others Responsible for Emergency Care of the Sick and Injured at the Scene and During Transport: Guidelines and Recommendations*.

In 1971, the AAOS published *Emergency Care and Transportation of the Sick and Injured*. The textbook was first conceived by Walter A. Hoyt, MD, FACS—father of David B. Hoyt, MD, FACS, COT Chair (1998–2002) and Past-Executive Director of the ACS. Subsequent editions have featured ongoing contributions by members of the COT, and this textbook, now in its 11th edition, remains one of the bestselling EMS textbooks available on the market. Finally, the National Registry of Emergency Medical Technicians was formed in 1970 to unify examinations and certifications of prehospital providers on a national level.

In 1973, the US Congress passed the Emergency Medical Services Systems Act. Managed by the Health Resources and Services Administration (HRSA), this act provided funding for more comprehensive state and local government EMS systems. In 1981, the President of NAEMT asked Norman E. McSwain Jr., MD, FACS, to investigate developing a trauma course based on Advanced Trauma Life Support® (ATLS®) principles but focused on prehospital care providers. This course soon became the PHTLS Course. The PHTLS Course was founded on the principle that prehospital care providers could make reasoned decisions regarding patient care when educated on appropriate anatomy and physiology, mechanism of injury, patient assessment, and treatment principles.


Dr. C. William Schwab


Dr. A. Brent Eastman


Dr. Robert Mackersie


Dr. Michael Rotondo


Dr. Avery Nathens

After several pilot courses took place in 1983, national promulgation of PHTLS began in 1984 through several regional faculty workshops that trained individuals to administer the course. In 2001, the US Army adopted PHTLS as a standardized program for all Army medics. Undoubtedly, PHTLS has significantly contributed to the improved outcomes of countless trauma patients, and this achievement would have been impossible without the ACS COT's support.

The goal of trauma care in the field is to establish an airway, treat life-threatening injuries such as hemorrhage, and stabilize fractures, all while maintaining minimal scene times before transport to a trauma center. The COT was pivotal in creating the first field triage guidelines for destination determination of the injured patient in 1976. In 2006, the COT worked with the National Highway Traffic Safety Administration (NHTSA) and the Centers for Disease Control and Prevention (CDC) to support the evidence-based revision of these guidelines along with subsequent revisions in 2009 and 2011. In 2021, with the NHTSA's support, the EMS Committee led a multidisciplinary technical expert panel, which included feedback from EMS and a comprehensive literature review, in the latest revision of these guidelines (see Figure 1, page 31).

Liaison relationships make the EMS Committee unique and offer a specialized ability to both connect and communicate across professional boundaries. These relationships have been a priority since the beginning of committee activities. For example, the EMS Committee was instrumental in the development of the STOP THE BLEED® program. Beginning in 2013, Eileen M. Bulger, MD, FACS, EMS Committee Chair (2012–2015), convened a multidisciplinary panel to conduct a systematic review of the literature and make recommendations regarding external hemorrhage control for EMS providers. Additionally, ACS COT has partnered with the American College of Emergency Physicians (ACEP), NAEMT, and the National Association of EMS Physicians (NAEMSP), on a series of consensus-based guidance documents. These topics include spinal motion restriction practices, the prehospital use of ketamine, prehospital hemorrhage control, prehospital use of tranexamic acid, and spinal motion restriction (see Table 1, page 32).

EMS will continue to evolve, and the ACS COT will continue to change as well to meet the needs of patients and providers. Gone are the days when the goal of EMS was to reach a trauma center quickly. EMS is now bringing critical care to the patient. EMS has also moved out of the traditional prehospital setting. Community paramedics are treating patients in their homes and assisting in managing chronic conditions. How do we use community paramedicine to care for the trauma patient? Can we keep a trauma patient who may have to travel hours for follow-up appointments at home to be seen by a community paramedic with telemedicine capability? Providers around the world will look to the COT EMS Committee for guidance on answering these questions and more, and we will deliver. Finally, we need to continue to get young trauma surgeons engaged in EMS. It is the young trauma surgeons who will continue the work of the committee and lead the care of the injured patient of any age, across the entire continuum, into the future.

Trauma Systems

The concept of the modern trauma center emerged in the mid-20th century. Indeed, it was not until the 1960s that the approach to caring for injured patients shifted toward a dedicated institutional healthcare focus. The 1966 publication of the National Research Council report, *Accidental Death and Disability: The*

FIGURE 1. NATIONAL GUIDELINE FOR THE FIELD TRIAGE OF INJURED PATIENTS

RED CRITERIA: High Risk for Serious Injury

INJURY PATTERNS

- Penetrating injuries to head, neck, torso, and proximal extremities
- Skull deformity, suspected skull fracture
- Suspected spinal injury with new motor or sensory loss
- Chest wall instability, deformity, or suspected flail chest
- Suspected pelvic fracture
- Suspected fracture of two or more proximal long bones
- Crushed, degloved, mangled, or pulseless extremity
- Amputation proximal to wrist or ankle
- Active bleeding requiring a tourniquet or wound packing with continuous pressure

MENTAL STATUS & VITAL SIGNS

All Patients

- Unable to follow commands (motor GCS <6)
- RR <10 or >29 breaths/min
- Respiratory distress or need for respiratory support
- Room-air pulse oximetry <90%

Age 0–9 years

- SBP <70mm Hg + (2 x age in years)

Age 10–64 years

- SBP <90 mm Hg or
- HR >SBP

Age ≥65 years

- SBP <110 mmHg or
- HR >SBP

Patients meeting any one of the above RED criteria should be transported to the highest-level trauma center available within the geographic constraints of the regional trauma system.

YELLOW CRITERIA: Moderate Risk for Serious Injury

MECHANISM OF INJURY

- High-risk auto crash
  - Partial or complete ejection
  - Significant intrusion (including roof)
    - >12 inches occupant site OR
    - >18 inches any site OR
    - Need for extrication for entrapped patient
  - Death in passenger compartment
  - Child (age 0–9 years) unrestrained or in unsecured child safety seat
  - Vehicle telemetry data consistent with severe injury
- Rider separated from transport vehicle with significant impact (e.g., motorcycle, ATV, horse, etc.)
- Pedestrian/bicycle rider thrown, run over, or with significant impact
- Fall from height >10 feet (all ages)

EMS JUDGMENT

Consider risk factors, including:

- Low-level falls in young children (age ≤5 years) or older adults (age ≥65 years) with significant head impact
- Anticoagulant use
- Suspicion of child abuse
- Special, high-resource healthcare needs
- Pregnancy >20 weeks
- Burns in conjunction with trauma
- Children should be triaged preferentially to pediatric-capable centers

If concerned, take to a trauma center

Patients meeting any one of the YELLOW CRITERIA WHO DO NOT MEET RED CRITERIA should be preferentially transported to a trauma center, as available within the geographic constraints of the regional trauma system (need not be the highest-level trauma center).

TABLE 1. MULTIORGANIZATIONAL GUIDANCE

Title	Year Published
Guidelines for Withholding or Termination of Resuscitation in Prehospital Traumatic Cardiopulmonary Arrest: A Joint Position Paper from the National Association of EMS Physicians Standards and Clinical Practice Committee and the American College of Surgeons Committee on Trauma	2003
Drug-assisted Intubation in the Prehospital Setting: American College of Emergency Physicians, American College of Surgeons Committee on Trauma, and the National Association of EMS Physicians	2005
Withholding and Termination of Resuscitation of Adult Cardiopulmonary Arrest Secondary to Trauma: Resource Document to the Joint NAEMSP-ACSCOT Position Statements	2013
Appropriate Use of Helicopter Emergency Medical Services for Transport of Trauma Patients: Guidelines from the Emergency Medical System Subcommittee, Committee on Trauma, American College of Surgeons	2013
EMS Spinal Precautions and the Use of the Long Backboard	2013
An Evidence-based Prehospital Guideline for External Hemorrhage Control: American College of Surgeons Committee on Trauma	2014
Guidance Document for the Prehospital Use of Tranexamic Acid in Injured Patients	2016
Spinal Motion Restriction in the Trauma Patient—A Joint Position Statement	2018
Ketamine Use in Prehospital and Hospital Treatment of the Acute Trauma Patient: A Joint Position Statement	2020

Sample of published multiorganizational guidance papers from 2003 to 2020, in which COT EMS Committee either led or participated

Neglected Disease of Modern Society, is the cornerstone of EMS development and systems of trauma care. The report crystallized key concepts in caring for the injured patient and continues to drive progress in trauma system development. A fundamental concept from this report was that all hospitals are not created equal, and injured patients should be taken to a facility that best meets their needs. This assertion relates to another key concept of trauma care—hospitals do not function in isolation but are part of an interconnected network. This complex includes the prehospital system, the hospitals providing care in the region, and the rehabilitation care needed to get patients back to their preinjury level of function. Taken together, these elements are the components of what we now recognize as a regional trauma system.

After the *Accidental Death and Disability* report was published, the 1966 Highway Safety Act mandated that all states develop EMS systems and established NHTSA as the federal compliance and oversight authority. Additional legislation supported emergency medical technician training and aeromedical evacuation capabilities. This progressive focus on transport and definitive care facilities was the beginning of the nascent trauma system. The seminal paper, "Systems of Trauma Care: A Study of Two Counties," published in 1979 in the *Archives*

PAST-CHAIRS

Subcommittee on Ambulance Equipment in the Emergency Treatment of Fractures

- Robert H. Kennedy, MD, FACS (1931–1934)

Subcommittee on the Transportation of Fractures

- Robert H. Kennedy, MD, FACS (1934–1939)

Subcommittee on Transportation of the Injured

- Roscoe C. Webb, MD, FACS (1944*–1951*)
- Richard H. Kiene, MD, FACS (1951*–1965)
- J. D. Farrington, MD, FACS (1965–1971)

Subcommittee on Emergency Services–Prehospital

- J. D. Farrington, MD, FACS (1971–1974)
- Kenneth F. Kimball, MD, FACS (1974–1979)
- Alan R. Dimick, MD, FACS (1979–1981)
- Norman E. McSwain Jr., MD, FACS (1981–1985)
- Lenworth M. Jacobs Jr., MD, FACS (1985–1988)
- Frank E. Ehrlich, MD, FACS (1988–1992)
- Stuart A. Reynolds, MD, FACS (1992–1993)
- Albert E. Yellin, MD, FACS (1993–1997)
- James E. Wilberger, MD, FACS (1997–2004)
- Mary E. Fallat, MD, FACS (2004–2007)
- Jeffrey P. Salamone, MD, FACS (2007–2011)

EMS Committee

- Eileen M. Bulger, MD, FACS (2011–2015)
- Mark L. Gestring, MD, FACS (2015–2020)
- Peter E. Fischer, MD, FACS (2020–present)

*No written record of term changes could be found

Dr. Peter Fischer

PAST-CHAIRS

Ad Hoc Committee Trauma System Consultation

- A. Brent Eastman, MD, FACS (1999–2003)
- Robert C. Mackersie, MD, FACS (2003–2006)

Ad Hoc Trauma System Evaluation and Planning Committee

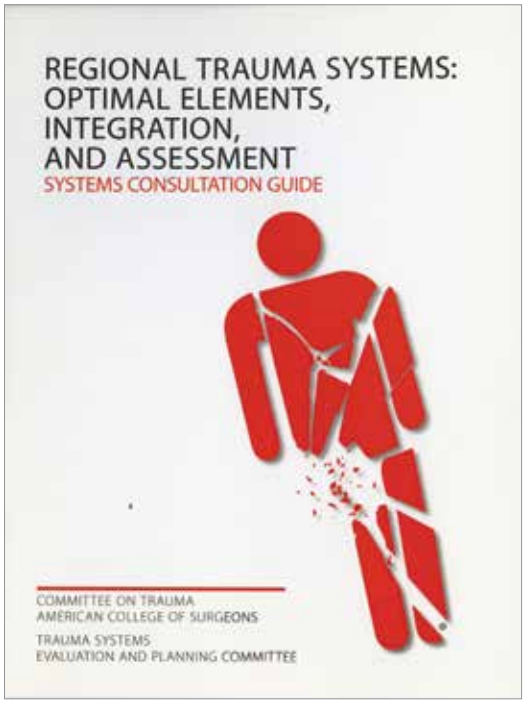
- Michael F. Rotondo, MD, FACS (2006–2009)
- Robert J. Winchell, MD, FACS (2009–2010)

Trauma System Evaluation and Planning Committee

- Robert J. Winchell, MD, FACS (2010–2018)
- Brian J. Eastridge, MD, FACS (2018–present)

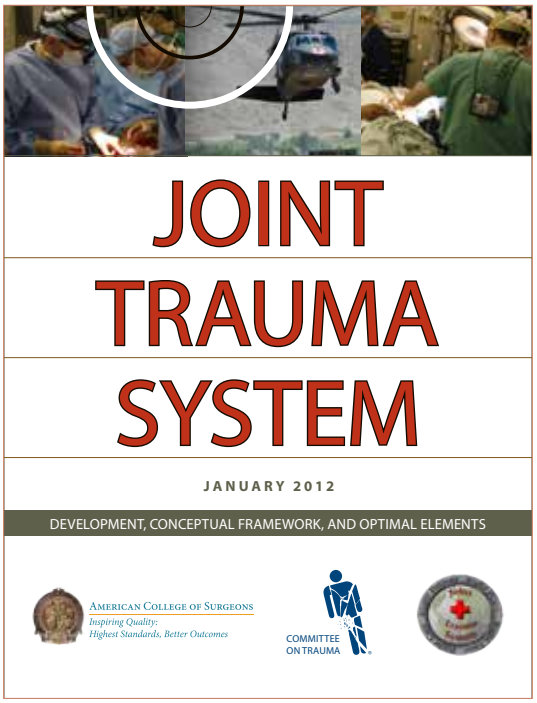
Dr. Brian Eastridge

FIGURE 2.



Regional Trauma Systems: Optimal Elements, Integration, and Assessment: The Systems Consultation Guide, also known as the "White Book," as published in 2008

FIGURE 3.



Joint Trauma System: Development, Conceptual Framework, and Optimal Elements published by the US Army Institute of Surgical Research in 2012, an outcome of the strong partnership between the military and the ACS COT

of Surgery by John G. West, MD, FACS, Donald D. Trunkey, MD, FACS (COT Chair 1982–1986), and Robert C. Lim Jr., MD, FACS, compared outcomes for injured patients in Orange County and San Francisco County, CA, and demonstrated a dramatic reduction in preventable death after injury because of the organized trauma system in San Francisco. These findings led to revolutionary efforts to organize trauma care nationwide.

The ACS initially concentrated on refining the concept of a trauma center to focus on care provided at the individual hospital level. The COT's *Optimal Hospital Resources for Care of the Seriously Injured* published in 1976 was instrumental in standardizing quality care for the injured. The subsequent revision of this document in 1979, *Hospital Resources for Optimal Care of the Injured Patient*, shifted focus to further define necessary institutional commitments to provide optimal care to the trauma patient. This document was foundational in creating a trauma center verification program that the Board of Regents approved in 1986, with the first site visit conducted in 1988.

The subsequent expansion of trauma centers in both number and sophistication highlighted the need for parallel development of a systems-based approach to trauma care that extended beyond the reach of a single, high-functioning trauma center. The few high-level trauma centers were a good fit for urban areas but would be impossible to create or sustain in less populated settings. To optimize resource use and improve outcomes, the COT envisioned an inclusive trauma system model in which all health facilities in a region provided care for the injured to the extent of their capacity.

The first attempt at a formal trauma system evaluation was conducted in Palm Beach, FL, in March 1994 and predated any formal COT committee tasked to evaluate trauma systems. Leading this effort was C. William Schwab, MD, FACS, and a multidisciplinary team. This evaluation system highlighted the need for formally established standards and a formal COT-driven evaluation process. ACS Past-President A. Brent Eastman, MD, FACS (COT Chair, 1990–1994), created a multidisciplinary

"Envision me standing before a large map of the US with a dart in my hand and being blindfolded and throwing a dart at the map. It shouldn't matter where the dart lands, only that somebody injured at the particular geographic location should be expeditiously transported to the level of care commensurate with their injuries."

—A. Brent Eastman, MD, FACS

Working Group for Trauma System Evaluation in 1994, which was charged with developing standards, metrics, and processes for evaluating trauma systems. The Model Trauma Care System Plan, developed in 1992 by the HRSA, served as a template for creating the ACS COT Trauma System Consultation Program, known internally as the "Gray Book." The consultative service was designed to work cooperatively with regions to facilitate the development of trauma systems based on the inclusive trauma system model.

The Working Group for Trauma System Evaluation became the Ad Hoc Committee on Trauma System Consultation in 1999. That same year, the ad hoc committee conducted the first formal COT-sponsored consultation visit in Montana. This visit was conducted by a multidisciplinary team led by Dr. Eastman that included two ACS Past-Presidents: Ronald V. Maier, MD, FACS, and J. Wayne Meredith, MD, FACS (COT Chair, 2002–2006), among others. The report from this first consultation visit generated more than 150 recommendations for systematic improvements that the Montana system implemented in subsequent years. This was the start of operationalizing Dr. Eastman's vision for a regionalized trauma system. "Envision me standing before a large map of the US with a dart in my hand and being blindfolded and throwing a dart at the map. It shouldn't matter where the dart lands, only that somebody injured at the particular geographic location should be expeditiously transported to the level of care commensurate with their injuries," Dr. Eastman said.

As the second Chair of the Trauma Systems Consultation Committee in 2002, Robert C. Mackersie, MD, FACS, continued to refine and expand the new consultation program. During this time, HRSA updated the *Model Trauma Care System Plan,* incorporating the CDC's model of public health and, in 2006, published *Model Trauma System Planning and Evaluation,* which expanded on the inclusive trauma system concept and added sections on benchmarks, indicators, and scoring (BIS) that provided a means to evaluate trauma systems in various settings and various levels of maturity. The committee's name was subsequently changed to the Trauma System Evaluation and Planning Committee (TSEPC), and the "Gray Book" was revised under the leadership of Michael F. Rotondo, MD, FACS, who had become the third Chair of TSEPC. Avery B. Nathens, MD, MPH, PhD, FACS, FRCSC, led this effort with 25 contributing authors who published the manual *Regional Trauma Systems: Optimal Elements, Integration, and Assessment: The System Consultation Guide in 2008,* christened the "White Book," which continues to serve as the basis for the trauma systems consultation process (see Figure 2, page 34).

In the first years of the consultation program, nine consultations had been completed from 1995 to 2005. With a mission to visit all 50 states, Dr. Rotondo completed 14 consultations and two facilitated BIS assessments, including five consultations in both 2008 and 2009—a pace that remains an annual record.

Dr. Rotondo's tenure coincided with the wars in Iraq and Afghanistan. During these conflicts, the military approach to care of the injured was refined, leading to significant improvements in survival, and for the first time, many surgeons called to duty had experience with civilian trauma systems

TABLE 2. ESSENTIAL TRAUMA ELEMENTS

#1 – Continuum of Care	#7 – System Trauma Registry
#2 – Statutory Authority	#8 – Injury Epidemiology
#3 – Multidisciplinary Advisory Group	#9 – System-Wide Performance Improvement
#4 – Trauma System Plan	#10 – Confidentiality and Discoverability
#5 – Needs-Based Designation	#11 – Disaster Preparedness
#6 – Funding	#12 – Military Integration

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and the COT. By 2007, the military's deployed Joint Theater Trauma System (JTTS) was operating at an elevated level, capable of treating combat wounded at forward surgical facilities within 1 hour of injury, with evacuation to high-level care at Landstuhl Regional Medical Center in Germany within 24–72 hours, and to top-level facilities within the US as soon as 72 hours from injury. There were growing concerns this hard-won knowledge would be lost with the eventual end of the large-scale conflicts. In response, TSEPC codified the structure and function of the JTTS within the framework that TSEPC used in civilian trauma systems, resulting in the *Joint Trauma System: Development, Conceptual Framework, and Optimal Elements* published by the US Army Institute of Surgical Research in 2012 (see Figure 3, page 34). This project illustrates the growing partnership between the military and the ACS COT and TSEPC that has characterized the past 20 years.

Robert Winchell, MD, FACS, became the fourth TSEPC Chair in 2010 and spent his 8-year tenure completing numerous consultation visits and helped to create the initial Needs-Based Assessment of Trauma System (NBATS) tool to provide objective data to support policy decisions in selecting trauma center designations. 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*.

This publication brought a renewed focus on trauma systems development in parallel with the military, thereby presenting a new opportunity to seek policy change at the national level and are

The core mission of TSEPC remains grounded in its founding tenets, one of which is that hospitals do not function in isolation, but, rather, are part of an interconnected network.

now a priority for the COT. With the support of NASEM and NHTSA, the COT, under the direction of Ronald M. Stewart, MD, FACS (COT Chair, 2014–2018), convened a broad stakeholder group with the aim to develop specific plans for implementation of the NASEM report findings. A subsequent COT workgroup then developed a set of essential trauma system elements that would define the minimum standards for a framework of trauma care. Today, the guiding document for the consultation process, the White Book, is being revised to align with the new essential elements while retaining the inclusive systems approach and public health roots (see Table 2, page 36).

Brian J. Eastridge, MD, FACS, a US Army Reserve surgeon and the original deployed JTTS Trauma System Director, is the fifth and current TSEPC Chair, appointed in 2018. Within 2 years, Dr. Eastridge pushed the number of completed state visitations to 39. The COVID-19 pandemic response highlighted opportunities for TSEPC to not only improve the consultation processes, but also advance the concept of the Regional Medical Operations Center (RMOC). The goal of the RMOC is to strengthen regional care delivery through enhanced coordination and facilitate the most appropriate level of care based on each patient's acuity for as many individuals as possible, while maintaining patient safety and keeping as many patients as possible within local facilities that can provide quality care. The ability to "load balance" patient care needs across healthcare facilities and systems would prevent any individual facility transitioning to crisis mode. The RMOC bolsters the ongoing groundwork for a national trauma system.

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TABLE 3. NTEPS ARCHITECTURE

Philosophically, this NTEPS would support the consensus objectives developed by the American College of Surgeons Committee on Trauma, including the following:

- The NTEPS would prioritize care for all injured patients, regardless of age, demographics, or geography.
- Resources would be integrated across the continuum of the patient experience, from point of injury to reintegration in society.
- The NTEPS would be a continuous learning community with three pillars: trauma care, injury prevention, and system readiness. These pillars rise from a foundation of research, quality improvement, standards, and education.
- The NTEPS will support an integrated network of Regional Medical Operations Centers which can facilitate daily movement of trauma patients and scale up to work collectively to manage any mass casualty event.
- Success of the NTEPS would be measured in improved access, quality, and efficiency of injury care, reduce injury, and enhance readiness.

The core mission of TSEPC remains grounded in its founding tenets, one of which is that hospitals do not function in isolation, but, rather, are part of an interconnected network. The TSEPC consultation program's future work will be to refine metrics of trauma system performance, research the efficacy of trauma systems, and identify best practices for system implementation while incorporating the newly refined essential elements.

The overarching long-term vision of TSEPC is to develop a National Trauma and Emergency Preparedness System (NTEPS) architecture at the federal level, building upon the 2016 NASEM report, and incorporating the lessons learned during the COVID-19 pandemic (see Table 3, this page). NTEPS will be predicated upon strong leadership at the federal level, operationalizing the recommendations of the report and ongoing advocacy and trauma system leadership from the ACS COT. ♦

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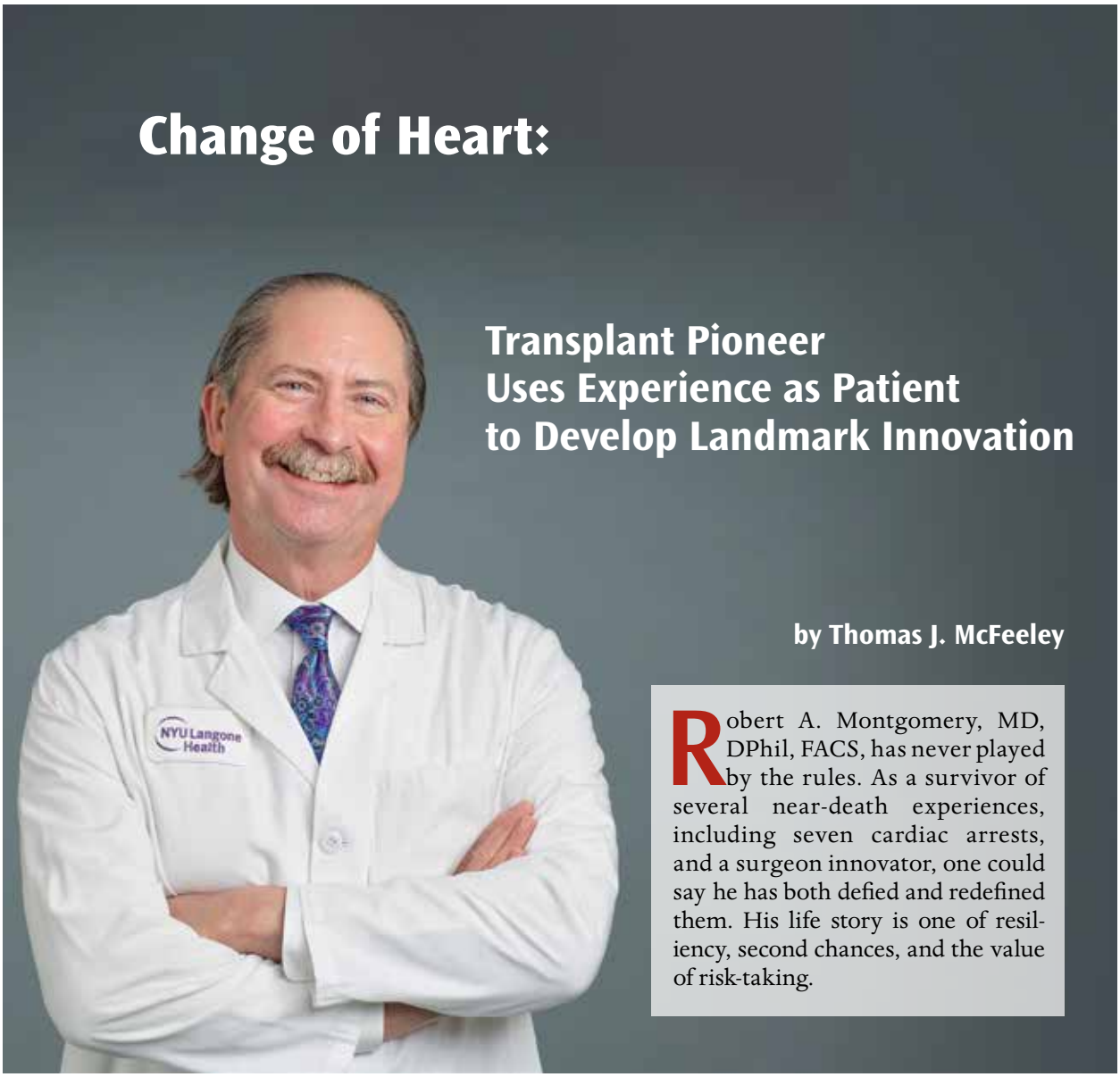
MONTGOMERY FAMILY PHOTO

NYU LANGONE HEALTH

Change of Heart:

Transplant Pioneer Uses Experience as Patient to Develop Landmark Innovation



NYU LANGONE HEALTH

by Thomas J. McFeeley

Robert A. Montgomery, MD, DPhil, FACS, has never played by the rules. As a survivor of several near-death experiences, including seven cardiac arrests, and a surgeon innovator, one could say he has both defied and redefined them. His life story is one of resiliency, second chances, and the value of risk-taking.

NYU LANGONE HEALTH

Dr. Montgomery in the NYU Langone Health video, *100&Change: Revolutionizing Organ Transplantation Through Genome Writing, https://youtu.be/POzNIbvJc48*

His first near-death experience came when he was a teenager, while working at a sewage plant. A crane operator moving large concrete blocks hit Dr. Montgomery across his torso and knocked him through a form for a new tank, straight into a skimming vat full of raw sewage.

"Thank goodness that form gave way, or I would have been crushed. My legs caught on that form, and I ended up floating on my back in raw sewage," he said. "They immediately removed me, took me to the decontamination room, and hosed me down. It was a humbling first job, for sure. But they gave me a half-day off."

Not only did he earn that time off, but he also learned a higher lesson.

"Beside the sewage plant, we would work jobs high off the ground, which was exciting for a 16- or 17-year-old kid, but we worked alongside men who were 50 and 60 years old, who had been doing this work their whole lives," he said. "I just remember thinking, 'I don't know if I could do this kind of physically taxing work my whole life.' They were remarkable men, but it was a good lesson to stay in school and pursue something where you didn't have those physical demands."

Life lessons are like mileposts in Dr. Montgomery's journey. The deaths of his father and later his brother revealed a genetic heart condition that inspired a groundbreaking career in organ transplantation. His own heart transplant, which involved an organ donation from a patient who died from a drug overdose and had hepatitis C, gave him a renewed vigor to challenge the notion that one human needs to die so another can live.

Overleaf photos: Dr. Montgomery supported by his wife Denyce Graves during his postoperative rehabilitation; Dr. Montomery in the NYU Langone Health video, *100&Change: Revolutionizing Organ Transplantation Through Genome Writing, https://youtu.be/POzNIbvJc48*

"Bobby Doesn't Think the Rules Apply to Him"

Dr. Montgomery's proclivity for thinking outside the box was apparent from an early age. As a second grader, Dr. Montgomery went home with a mediocre report card. He was a good student, but the nuns at his Buffalo, NY-area Catholic school noted that he lacked a certain discipline to reach his full potential.

"They wrote in my report card that 'Bobby doesn't think the rules apply to him,'" he said. "So, it wasn't working out with the nuns, and I wasn't long for Catholic school. Most of my time there was spent being punished in the corner facing away from everyone, so I wasn't getting much out of it anyway."

The youngest of four boys, he described a normal, happy childhood, particularly after his family moved from Buffalo to Philadelphia, PA, where he attended less stringent public schools. In his early teens, his 50-year-old father suffered heart issues, including several cardiac arrests and resuscitations. As a result, Dr. Montgomery spent many afternoons doing his homework in his father's hospital room. Eventually, his mother had a crucial conversation with the physicians after a series of drugs had minimal, if any, impact.

"She said, 'None of this is working, so what's left to try?'" he explained. "There was heart transplantation at the time, but this was 1976, and the doctors told her it wasn't available to anyone over 50 and it still didn't work that well anyway. I remember thinking, 'Why doesn't it work? Why isn't this an option?'"

Shortly after that conversation, Dr. Montgomery's father had a final heart attack that left significant brain injury and put him in a vegetative state. Several months later, he contracted pneumonia and died.

Dr. Montgomery's father, Lawrence Montgomery, who was in a heavy bomber squadron island-hopping in the South Pacific for 4 years during World War II

Dr. Montgomery, age 11

"Before he died, he prepared me to help take care of things around the house, paying bills and that sort of thing," Dr. Montgomery said. "He didn't talk much about his experiences or his illness, but one day he told me, 'You shouldn't be afraid of dying; it's not a bad thing.' It's not what a 15-year-old boy wants to hear, but that was my reality."

It also was his first lesson in resilience.

Genetic Condition Revealed

Years later, when 27-year-old Dr. Montgomery was an intern at The Johns Hopkins Hospital in Baltimore, MD, his 35-year-old brother died while waterskiing, which confirmed a genetic heart condition. As a result of this familial cardiomyopathy, Dr. Montgomery had a defibrillator implanted.

He was unsure if he could become a surgeon, as it was unclear then whether the equipment in the operating room would interfere with the device. Thankfully, he was safe for surgery. Among other achievements, Dr. Montgomery has:

- Performed approximately 2,000 kidney transplants
- Pioneered kidney paired donation chains, now responsible for more than 1,000 transplants in the US each year
- Co-developed the laparoscopic donor nephrectomy

He is in the 2010 Guinness World Records for performing the most kidney transplants in a day. In 2009, as director of The Johns Hopkins Comprehensive Transplant Center, Dr. Montgomery led a four-hospital, 16-person "domino kidney transplant" procedure, in which eight incompatible familial donors gave their organs to strangers so their loved one could receive a compatible organ in return. Several of his operations have become story lines for the TV drama *Grey's Anatomy*.

While he has saved many patients' lives, the defibrillator has saved his life on numerous occasions: hiking in the Andes, at the Broadway show *School of Rock,* and at a medical conference in Italy. It was after that medical conference in 2018 that Dr. Montgomery was hospitalized in Italy and even given last rites by a priest. He checked out against medical advice and returned to his own transplant program at NYU Langone Health in New York City.

"I knew it was time. I couldn't afford to wait anymore," he reflected.

"That's What Leaders Do"

So, the transplant pioneer became a transplant patient in his own program. He would be operated on by surgeons whom he had recruited and hired. But first he had to find a heart.

"People have to be in very, very bad shape to receive a transplant, and about half of those people don't make it," he said. "And to receive an organ, you must be lucky. For me, I'm a large guy and I need—no pun intended—a big heart, so it wouldn't be easy to find a match."

Dr. Montgomery was careful he did not receive favoritism. He specifically asked to receive a heart from a hepatitis C patient, found often in opioid overdose cases. Dr. Montgomery had been working on a program to transplant hepatitis C-positive organs in patients who did not have the virus, knowing they'd contract the disease, which was becoming easily

CAITLIN OCHS FOR NYU LANGONE HEALTH

Dr. Montgomery recovers after a biopsy procedure 3 months after transplant

Left: Dr. Alex Reyentovich (left), medical director of the heart transplant program, NYU Langone Health

Center: Dr. Nader Moazami, surgical director of the heart transplant program, NYU Langone Health

treatable with medications. He was the 17th subject in that trial.

"We were discarding all these hep C hearts from perfectly good donors, when we could save more lives," he said. "I was aware at the time that my taking a hep C heart would set an example for something that I really believed in, but that's what leaders do. But it was also preemptive survivor's guilt—that if I took a perfect organ, I would be taking it from one of our other patients."

Dr. Montgomery waited about 2 weeks as a patient in the intensive care unit. It was then that a 25-year-old man with hepatitis C died from a heroin overdose in a neighboring state. The transplant team prepared for surgery.

"It was a little bit surreal," said Deane E. Smith, MD, FACS, who was on his surgical team. "It was almost like we were unconscious. Obviously, we knew that this was our boss, the leading pioneer in transplantation, but from the time the operation started until it was over, not once did all that come into play. Honestly, when the boss says, 'It's okay for you to do this thing that requires your hands inside of me,' that's a bond that is difficult to put into words in a way that most people would understand."

While the hepatitis C heart program quickly has become routine in transplantation, Dr. Montgomery focused first on his recovery and then locked in on the next innovation in transplantation.

"Waiting in the ICU, I kept thinking about this paradigm that we've been under in transplantation for so long, which is that somebody has to die for someone else to live," he said. "That came into focus in a new way when I experienced it myself. That was the moment when I said, 'We've got to figure something else out.'"

When Pigs Fly…

"It was such a long shot that I survived everything that I really began to think there was some purpose, that I still had a purpose," Dr. Montgomery said. "After the transplant, I was already thinking about what I would have to do to take that next step. It was like I was training for an Olympic event, and I had a new energy, a new focus."

Xenotransplantation is not new. In the 1980s, an infant born with a fatal heart condition, Baby Fae, died within a month of receiving a baboon heart. Later attempts involving nonhuman primates receiving pig organs failed. But advances in gene editing and cloning techniques, specifically the gene-editing CRISPR technology, gave new life to the prospects of xenotransplantation.

Before his transplant, Dr. Montgomery attended the Kennedy Center Honors with his wife, an accomplished opera singer. He caught wind that Martine Rothblatt, the CEO of the biotech firm United Therapeutics (UT), would be in attendance and sought her out before the event. A day later, he and Rothblatt talked for 4 hours about xenotransplantation.

UT develops technologies that expand the availability of transplantable organs. Rothblatt, the

NYU LANGONE HEALTH

Dr. Montgomery and a team member in a scene from the NYU Langone Health video, *Lifesaving Potential of Xenotransplantation, https://youtu.be/xl06IscEg_Y*

founder of SiriusXM radio, sold that company to launch UT and successfully develop a cure for her daughter's pulmonary hypertension.

"The work Rothblatt and her company had been doing dovetailed so nicely with the work I'd been doing and the work I wanted to do. I had so much of the transplantation knowledge, and they had genetically altered pigs. We just got to work and made a plan," Dr. Montgomery said.

That plan—a complex marriage of regulatory, governmental, medical, and technological elements—unfolded over 4-plus years, and came to fruition September 25, 2021, when Montgomery performed the first successful pig-to-human kidney transplant. The groundbreaking surgery triggered an avalanche of interest, research, and other procedures. Dr. Montgomery predicts that pig-to-human xenotransplantation will become commonplace within 10 years.

"I'm not sure that without my own transplant, I would have had the fire to move xenotransplantation along that quickly," he said. "It was truly a partnership, but any partnership is only as strong as its weakest participant. Getting a heart positive for hepatitis C, having that work, and knowing that we need to change the death-for-life paradigm, that inspired me to do the work for myself to be healthy and also be strong enough to achieve the next big thing in transplantation."

Following his xenotransplantation operation, another team of surgeons, led by Bartley P. Griffiths, MD, FACS (see the June 2022 issue of the *Bulletin*), successfully transplanted a pig heart into a human. Research from those operations alone will help kick-start clinical xenotransplantation and push it through myriad ethical and regulatory issues.

"He Functions in a Different Place"

From his second-grade conflicts with the nuns to his own heart transplant and beyond, Dr. Montgomery has not only forged a unique path, but he's also traveled it differently than others would.

"Dr. Montgomery, he's one of these people that functions in a different place than the rest of us," Dr. Smith said of his mentor. "He is really not bound by the same expectation or limitations that a lot of us operate under. There is this group of people in medicine, and probably in the world, who can see opportunity where other people see reasons that it won't work. That has been Dr. Montgomery's modus operandi for as long as I've known him."

Perhaps the rules do not apply to Dr. Montgomery, especially when he is focused on rewriting them. ♦

THOMAS McFEELEY is Speechwriter, Division of Integrated Communications, Chicago, IL.

ACS Cancer Research Program:

New Volume of Cancer Surgery Recommendations Released

by Susan Deming, PMP, Amanda Francescatti, Rebecca Snyder, MD, MPH, MS, FACS, Judy C. Boughey, MD, FACS, Matthew H. G. Katz, MD, FACS, and Christina L. Roland, MD, MS, FACS

The American College of Surgeons Cancer Research Program (ACS CRP) recently released the third volume of *Operative Standards for Cancer Surgery,* a valuable resource for both oncology surgeons and general surgeons. Now available in digital and print, Volume 3 provides evidence-based recommendations on the technical conduct of cancer operations for sarcoma, adrenal, neuroendocrine, peritoneal, urothelial, and hepatobiliary cancers.

Stay on Top of Latest Research

Surgeons have increasing demands on their time, making it challenging to keep abreast of the latest research and integrate it into practice. "With any component of care, there is evidence of what is effective, but there is accompanying variability in actual practice," said David B. Hoyt, MD, FACS, Immediate Past-Executive Director of the ACS. The goals of *Operative Standards for Cancer Surgery* are to address that variability and ease the burden on surgeons. The authors of these volumes—diverse teams of experts from organizations across the country—analyzed and distilled the best-available evidence into concise standards, making it easier for surgeons to incorporate evidence-based techniques into daily practice.

Like the previous two volumes, Volume 3 breaks down the components of major cancer operations for each of the six disease sites into critical elements—the steps from incision to closure that ensure the best outcomes for cancer patients. Using clear, concise text and more than 150 illustrations, the authors describe how each critical element should be performed based on a review of available literature and expert opinion and explain the rationale and level of evidence behind the recommendation. In addition, the authors analyze the evidence surrounding identified areas of controversy or key questions, which represent important areas of future investigation. Each section also includes a synoptic operative report template that lists data elements and responses deemed important to document for each operation. Synoptic operative reports allow for more accurate and streamlined data collection.

Unique Resource for Cancer Surgeons

The *Operative Standards for Cancer Surgery* provide a unique resource to surgeons. "Although guidelines for multidisciplinary cancer care exist from many sources, these manuals represent the only large compendium of standards that specifically inform the technical conduct of surgery," said Matthew Katz, MD, FACS, Chair, ACS Cancer Surgery Standards Program.

Nine disease sites, representing some of the most common cancers, were covered in Volumes 1 and 2. Volume 1 was published in 2015 and provided recommendations for the breast, lung, pancreas, and colon. Three years later, Volume 2 was released, covering thyroid, gastric, rectum, esophagus, and melanoma. With Volume 3, the *Operative Standards for Cancer Surgery* expands to cover sarcoma, adrenal, neuroendocrine, peritoneal, urothelial,

Operative Standards for Cancer Surgery

Volumes 1, 2, and 3

and hepatobiliary—more uncommon cancers in which standardized recommendations are particularly valuable.

"Due to the rarity of the disease, there is less evidence and more heterogeneity in the way surgeons conduct operations," said Christina L. Roland, MD, FACS, Chair, ACS Cancer Care Standards Development Committee and Co-Chair, ACS Sarcoma Section of *Operative Standards for Cancer Surgery*, Volume 3. "Defining technical standards for rare diseases is critical for improving outcomes."

After Volumes 1 and 2 were published, the ACS CRP recognized the gap between publication of standards and incorporation into practice. To fill that void, select standards from Volumes 1 and 2 are now included in the Commission on Cancer (CoC) 2020 accreditation standards, *Optimal Resources for Cancer Care*. Standards 5.3 through 5.8 establish evidence-based best practices for operations conducted for breast cancer, colon cancer, lung cancer, melanoma, and rectal cancer.

Those standards "are now being implemented at CoC-accredited centers nationwide and will help to ensure that cancer surgery is performed at these centers to the highest standards possible," said Dr. Katz. He anticipates that, as with Volumes 1 and 2, select technical standards in Volume 3 will be incorporated into CoC standards in the future.

Get Your Copy Today

Operative Standards for Cancer Surgery, Volume 3, is an essential guide for surgeons who are focused on delivering high-quality care and achieving the best outcomes for their patients.

Order a copy online at *facs.org/oscs*. For more information, contact *cancerresearchprogram@facs.org*. ♦

SUSAN DEMING, PMP, is Senior Creative Project Manager, ACS Division of Integrated Communications, and former Project Manager, ACS Cancer Research Program and Cancer Surgery Standards Program, Division of Research and Optimal Patient Care, Chicago, IL.

Those standards "are now being implemented at CoC-accredited centers nationwide and will help to ensure that cancer surgery is performed at these centers to the highest standards possible."

—Matthew Katz, MD, FACS

The Joint Commission

A Look at The Joint Commission:

Take a Stand Against Gun Violence

by Lenworth M. Jacobs Jr., MD, MPH, FACS

Buffalo, NY. Uvalde, TX. Highland Park, IL.

Three cities in vastly different areas of the US now are part of the same club—places that have been affected by the crisis of gun violence in America.

The locations where these mass shooting and mass casualty events occurred: a supermarket, an elementary school, a Fourth of July parade.

Healthcare centers are not immune to the scourge of gun violence. In June, a shooter claimed the lives of four people at Saint Francis Hospital in Tulsa, OK. Media reports stated that one of the victims was the shooter's surgeon, whom he blamed for his continuing pain after a recent operation.

The Time Is Ripe for Change

These mass casualty events are just a fraction of an issue that is as ubiquitous as the air we breathe. This year alone, as of late August, 448 mass shootings and 29, 391 deaths have occurred because of gun violence, according to statistics compiled by the Gun Violence Archive—an independent online repository of data collected from more than 7,500 law enforcement, government, commercial, and news organizations.*

The data show that the American public wants change. A Gallup poll taken in June found that:

- 92% favored background checks for all gun sales
- 86% favored stopping people determined to be a risk to themselves or others from being able to purchase a gun
- 77% favored enacting a 30-day wait period for all gun sales
- 76% favored raising the legal age to purchase a gun to 21 years old
- 66% were in favor of stricter gun laws

Healthcare systems also have taken up the cause.

After the 2012 mass shooting at Sandy Hook Elementary School in Newtown, CT, and the Boston Marathon bombing a few months later, a number of concerned surgeons, along with the American College of Surgeons Committee on Trauma (ACS COT), developed the STOP THE BLEED® initiative to train non-healthcare professionals to stop uncontrolled bleeding in emergency situations. A goal of the initiative was to find a way to improve survivability during mass casualty situations. To date, more than 2.1 million people around the world have learned this technique, which includes:

- Applying one's hands to put pressure on a wound
- Packing a wound to control bleeding
- Correctly applying a tourniquet

In January 2013, the ACS also issued a statement on firearm injuries supporting legislation that would ban civilian access to assault weapons or large ammunition clips. It also advocated for:

- Enhancing mandatory background checks at gun shows and auctions
- Improving mental health screenings and patient counseling services
- Creating proactive, nonviolent conflict resolution education

*Gun Violence Archive. Number of deaths in 2022. August 3, 2022. Available at: https://www.gunviolencearchive.org.

"The nation's health depends on the well-being of our health workforce."

–US Surgeon General Vivek Murthy, MD, MBA

- Conducting evidence-based research on firearm injuries

In addition, The Joint Commission has published resources on this critical issue, such as a *Quick Safety* advisory on preparing for active shooter situations.[†] Updated in June 2021, it provides safety actions to consider for healthcare personnel who respond to an active shooter situation and suggestions for preparing an organization for a threat, such as:

- Involving local law enforcement in emergency plans
- Developing a communication plan for these types of events
- Establishing processes and procedures to ensure patient and employee safety
- Training and drilling employees on these procedures and for these types of events
- Planning how to manage the event after it ends

Additional resources from The Joint Commission include:

- *Sentinel Event Alert,* Issue 45: Preventing violence in the healthcare setting
- A Workplace Violence Prevention web portal that includes an emergency management resources for security and active shooter situations

Hidden in the data and advocacy, however, is the toll these senseless and horrific events exact on the victims, their loved ones, and the healthcare personnel tasked with saving as many lives as possible when gun violence erupts.

These events have a profound effect on the caregivers—physicians, nurses, and cleaning staff at a hospital—and their well-being may be affected negatively. Workforce well-being is a critical concern in the healthcare community, with US Surgeon General Vivek Murthy, MD, MBA, stating, "The nation's health depends on the well-being of our health workforce."

In that regard, The Joint Commission launched the Healthcare Worker Safety and Well-Being Resources website, which provides links to materials developed not only by The Joint Commission, but also key healthcare-related organizations, such as the National Academy of Medicine, government agencies (including the Office of the Surgeon General and the Centers for Disease Control and Prevention National Institute for Occupational Safety and Health). The content focuses on hospital- and system-level resources.

Gun violence is one of the critical issues of our time, yet obstacles remain in making substantive change. The gun safety legislation that President Joseph R. Biden recently signed into law was a start, but more needs to be done so that we can prevent future mass shootings in this country.

People deserve to be safe at shopping centers, schools, movie theaters, bowling alleys, restaurants, concerts, parades, and healthcare facilities.

If not now, when? ♦

Disclaimer

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

[†]The Joint Commission. Issue 4: Preparing for active shooter situations. *Quick Safety.* Revised June 2021. Available at: https://www.jointcommission.org/-/media/tjc/newsletters/quick-safety-4-active-shooters-update-5-19-21.pdf.

DR. LENWORTH JACOBS is professor of surgery and professor of traumatology and emergency medicine, University of Connecticut, and director, Trauma Institute at Hartford Hospital, CT. He is Medical Director, ACS STOP THE BLEED® program.

From Residency to Retirement:

Support Your Colleagues during National Suicide Prevention Awareness Month and Beyond

by Sharmila Dissanaike, MD, FACS, FCCM

A traditional Buddhist teaching divides all worldly desires into three categories: the desire to please the senses, the desire to become, and the desire to not exist. We are all familiar with the desire to please the senses. The multibillion-dollar advertising industry thrives on this desire. As surgeons, we have a significant desire to "become," to get where we are: first a doctor, then surgeon, perhaps further to be a surgical specialist or leader, as well as a spouse, parent, or any number of other roles we play in our communities. This urge motivates us to do the arduous work necessary to succeed in these various roles.

While talked about the least, we can all recognize the desire for annihilation, too. Those days when we just want to curl up in bed and pull the covers over our head or let our mind go blank in front of the TV and pretend life isn't waiting for us on the other side. "Stop the world; I want to get off," is a fleeting desire for most of us at some point. At unhealthier levels, occurring more frequently in combination with other factors, the desire for annihilation can manifest as addiction to alcohol, gambling, narcotics, and so on. At its unhealthiest, it can turn into self-harm and suicide.

When my friend and colleague died by suicide last year, it motivated me to dig deeply into the scientific literature on suicide. This was partly the habitual surgeon-leader response to convert tragedy into concrete action—to learn what steps I could take to prevent this happening again and teach others as well.

It was also partly to resolve my own confusion and channel my grief—an attempt to understand what could push someone so talented, intelligent, and kind to take that terrible last step. In the aftermath of suicide, those of us left behind oscillate between grief and anger. Understanding why someone who was well-loved could make this decision is beyond the scope of most of us, and we search for answers in different ways.

Dig Deeper for Real Causes

Through my research, I learned that most of us carry biases and assumptions about who is at risk for suicide and why. In the weeks after my friend's suicide, I heard speculation about introversion versus extroversion, being single versus married, living far from family, working too hard or for too long, burnout, the pandemic, and a whole host of variables that are probably tangentially related; yet none of these factors had compelling evidence to suggest a causal link.

Conversely, the most well-established risk factors in the psychiatric literature—with the best evidence to support causality—were rarely mentioned: substance abuse, major depression, and prior suicide attempts. If we hope to identify who among our friends, family, and colleagues are at risk of suicide and help them before it is too late, we need to turn our attention away from the superficial and dig deeper for signs of depression, substance abuse, and suicidal ideation. Making active efforts to look for hints of these is sometimes uncomfortable, though it is likely the most important thing we can do. Obviously, a healthy, supportive work and home environment are important, and finding ways to reduce the real stress of the pandemic and other life struggles that affect

National Suicide Prevention Awareness Month

SEPTEMBER

many surgeons are worthy of our efforts; however, it would behoove us to not lose sight of the biggest identified risk factors amid the many other topics.

Gone in a Flash

I was surprised to learn that suicide is an impulsive act. The common belief that someone who wants to commit suicide will find a way to do it—that it is the culmination of a longstanding desire, carefully planned and executed—is completely wrong. While struggles with substance abuse and depression can be longstanding, the actual impulse to commit suicide usually lasts less than 20 minutes and can be as short as 5 minutes.

Impulsivity is a particular hallmark of suicide attempts in children and young adults; however, it remains a characteristic across the age and gender spectrum. Having a firearm in the house, living or working in a high-rise building, and access to lethal medication, are major risk factors for completed suicide for this reason. If access to these and other tools are unavailable during that fleeting period, the person's life might be saved. Conversely, ensuring that someone who is at risk does not have easy access to lethal means during their brief period of heightened risk can buy enough time to get help and treat the underlying psychiatric illnesses that have brought them to this point.

Get Educated

Surgeons, like other physicians, are at greater risk for suicide than the general population. It would be wise for each of us to spend some time becoming a little more familiar with the topic, if only so we recognize the signs and reach out a little sooner. The American Psychiatric Association has valuable resources to explore this topic further at *psychiatry.org/patients-families/suicide-prevention*.

If you, or someone you care about is contemplating suicide right now, contact the National Suicide Hotline at 988. ♦

DR. SHARMILA DISSANAIKE is the Peter C. Canizaro Chair and University Distinguished Professor of Surgery, Texas Tech University Health Sciences Center, Lubbock TX, and an ACS Governor.

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Franklin Martin, MD, FACS,
Founder of the American College of Surgeons

From the Archives:

'Sorrow, Uncomplicated, Sometimes Kills Outright'

by Robert E. Bulander, MD, PhD

In September 1878, a young Arkansas surgeon named Edward Tandy Easley, MD, became ill in Memphis, TN. A graduate of the Louisville Medical College in Kentucky and Civil War veteran, Dr. Easley left his practice in Little Rock, AR, to volunteer in the city during a yellow fever epidemic. Overwhelmed by the sick and dying, in a "state of utter desolation," he wrote a letter to a friend, stating, "The facts are worse than the newspaper accounts" and that quarantines were needed to keep the epidemic from spreading further.*

Dr. Easley succumbed to yellow fever on September 30, cutting short a meteoric surgical career that, in less than 4 years, had seen him elected secretary of the American Medical Association surgical section and author of 18 publications. His posthumous final paper addressed a topic of significant concern—shock. To the 19th century surgeon, shock was an ever-present yet elusive foe. In a time when diseases were largely understood by the pathologic changes they left in tissues, shock—a functional rather than structural disorder—defied attempts at characterization.

His contemporaries saw shock as a bottom-up phenomenon—an injury to the body that disrupted the central nervous system, leading the heart to fail—whereas Easley took a more top-down approach. While allowing for shock from injury, Easley's model also gave thoughts, perceptions, and emotions the same power to harm as the force of a bullet. "That joy, grief, and terror may produce every degree of mental or nervous shock, is a fact both rational and well attested," he noted.† The mind created bodily reality. It could not only slow or stop the heart, but it also had sufficient power to degrade the blood, poisoning its character and rendering it incapable of sustaining life. If emotion were of sufficient intensity, Dr. Easley argued that there were "many authentic cases recorded" of the rupture of the heart itself, "consequent on tremendous mental agony" and terminating in fatal shock.†

During an era when surgery began looking to statistics for proof, Dr. Easley was an anachronism. While he saw value in numerical data, Easley also relied on metaphor, rhetoric, and literature.‡ He wrote that the "genius of Shakespeare" was revealed in his description of how shock produced Lear's madness; he cited the biblical gospels as evidence that mental anguish alone could lead to death. "Sorrow, uncomplicated, sometimes kills outright," he noted, adding, "[It] so paralyzes the functions of the brain and heart that the sufferer can no longer live."†

Dr. Easley's writing came at a time when surgeons were trying to understand diseases, such as shock, without access to the physiologic language and concepts we use today. It remains a useful case study in how the profession approaches problems that do not fit well into its existing theoretical models. ♦

DR. ROBERT BULANDER is assistant professor of surgery, University of Minnesota, Minneapolis.

*Jennings RG. *Transactions of the American Medical Association,* Vol. 30. Philadelphia, PA: Collins;1879:813-816.

†Easley ET. A study of shock. *Richmond and Louisville Medical Journal.* 1878;26:424.

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Dr. Mark Malangoni to Receive Distinguished Service Award

Clinical Congress is steeped in tradition and ceremony. From the welcoming of initiates—including 3 years of new Fellows in 2022—to the swearing in of new leaders, the event is unforgettable.

Since 1957, an annual highlight has been when the ACS bestows the Distinguished Service Award—its highest honor—to one eminently qualified surgeon. The award is in recognition of exceptional and continuous service as an ACS Fellow, as well as a career distinguished by devotion to patient care and the principles and ideals that guide all surgeons in their professional practice.

When the Congress convenes next month, that honor will go to Mark A. Malangoni, MD, FACS, a former member of the ACS Board of Regents (B/R) and Board of Governors (B/G).

"I cannot think of someone who exemplifies what this award and the American College of Surgeons exemplifies more than Dr. Malangoni," said Lewis Flint, MD, FACS, who served with Dr. Malangoni at the University of Louisville School of Medicine, Kentucky, for nearly a decade and remembers his patient-first philosophy. "In every stage of his career, Dr. Malangoni made surgeons better by instilling in them the philosophy that how the patient fares is the most important thing in all of surgery. He has always known and stressed that better surgeons come from better patient outcomes."

A recently retired general surgeon who lives in Lyndhurst, OH, Dr. Malangoni has been an ACS Fellow since 1983. In addition to serving on the B/R, he chaired both the B/G and Advisory Council for General Surgery, as well as serving on multiple other committees for the College. He also is a past president of the Ohio Chapter of the ACS and received the Chapter's Distinguished Service Award in 2005.

"I consider this award to be the greatest honor of my career," Dr. Malangoni said. "Since my induction, the College has provided opportunities to work with a multitude of talented surgeons, as well as the wonderfully resourceful American College of Surgeons' staff. I'm grateful to have had the opportunity to work with colleagues on various governance bodies, and I am grateful to the College for contributing to my professional growth. I stand in awe of the many ACS contributions to advance patient care."

As Dr. Flint reflected on his time with Dr. Malangoni, he remembered the philosophy that guided them at the University of Louisville.

"We were instructed to track the outcome of every patient; if there was something learned, we were to write it down and, if possible, publish it," Dr. Flint said. "Dr. Malangoni never refused a chance to teach others about lessons he learned in the profession."

In fact, Dr. Malangoni has authored or coauthored more than 200 peer-reviewed articles and 50 book chapters. He is a member or former member of the editorial boards for the *American Journal of Surgery, Annals of Surgery, Journal of the American College of Surgeons, Surgery, Surgical Infections,* and *World Journal of Emergency Surgery.*

A former adjunct professor of surgery at the University of Pennsylvania School of Medicine in Philadelphia, Dr. Malangoni served for more than 20 years as a professor of surgery at the Case Western Reserve University School of Medicine. He served as chair

"I cannot think of someone who exemplifies what this award and the American College of Surgeons exemplifies more than Dr. Malangoni."

—Lewis Flint, MD, FACS

of the department of surgery and as surgeon-in-chief at MetroHealth Medical Center, both in Cleveland, Ohio, during those same 20 years.

He is a past-president of the Central Surgical Association, the Surgical Infection Society, and the Cleveland Surgical Society. Dr. Malangoni served as vice-president of the American Surgical Association and the American Association for the Surgery of Trauma. He is a senior director and past chair of the American Board of Surgery and has held leadership roles for the American Board of Emergency Medicine. He also served as vice-chair of the Residency Review Committee for Surgery for the Accreditation Council for Graduate Medical Education. Dr. Malangoni was the associate executive director of the American Board of Surgery 2011–2019. A full list of DSA recipients is available at *facs.org/about-acs/governance/acs-committees/honors-committee/distinguished-service-recipients*, or scan the QR code for details. ♦

Official Notice:

Annual Business Meeting of ACS Members during Clinical Congress

In accordance with Article I, Section 6, of the *Bylaws,* the Annual Business Meeting of Members of the American College of Surgeons (ACS) is called for 4:15 pm on the afternoon of Wednesday, October 19, 2022, in Room 20A of the San Diego Convention Center in CA.

This session constitutes the Annual Business Meeting of Members, at which time the ACS Officers, Regents, and Governors will be elected and reports from Officials will be presented. Items of general interest to the Members also will be presented. Fellows are respectfully urged to attend.

If you haven't already registered for Clinical Congress, you can do so at *facs.org/clincon2022.* ♦

Tyler G. Hughes, MD, FACS
Secretary
American College of Surgeons
September 1, 2022

TQIP ANNUAL CONFERENCE

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Surgeons Sowing **Hope**

Surgical Metrics Project Returns to Clinical Congress

You can contribute to the growing demand for data sharing, data integration, and quality improvement by participating in the Surgical Metrics Project at Clinical Congress 2022 in San Diego, CA.

First offered at Clinical Congress 2019, the Surgical Metrics Project gives attendees the opportunity to use wearable technology to digitize their surgical actions and decisions and then compare their approaches to those included in a database of master surgeons.

The Surgical Metrics Project is a collaboration between the ACS and the American Board of Surgery and will take place Monday, October 17, through Wednesday, October 19, in the Exhibit Hall of the San Diego Convention Center.

Under the leadership of Carla M. Pugh, MD, PhD, FACS, professor of surgery and director of the Technology Enabled Clinical Improvement Center (TECI) at Stanford University, CA, the 2022 Surgical Metrics Project will feature a newly developed, comparative performance process that will enable Clinical Congress attendees to easily visualize the risks of their step-by-step decisions during a laparoscopic hernia repair.

"The results from the 2019 meeting served as a critical building block for the comparative performance and risk-assessment process we will share with the 2022 participants," Dr. Pugh said. "We discovered that mapping the technical decisions of experienced surgeons allows the creation of a risk-assessment map that provides great insight into the efficiency and potential risks of certain actions and decisions." The 2019 results were presented at the recent American Surgical Association annual meeting and published in the *Annals of Surgery*.

How to Participate

Active practice and retired surgeons who have experience in performing minimally invasive hernia repairs are invited to take part. Ten operating room stations will be available during exhibit hours, so everyone who is interested should be able to participate in the 30-minute exercise. No appointment is necessary.

Based on results from a TECI Center pilot completed in July, most surgeons will be able to complete the entire exercise in less than 30 minutes, Dr. Pugh said.

The simulated patient will have a realistic abdominal wall and hernia that can be repaired laparoscopically. Each station will have a surgical assistant and all the tools and equipment necessary to completing the procedure.

Each participant will be equipped with magnetic motion tracking technology that is small enough to fit under surgical gloves without hindering movement. Motion tracking data will be synchronized with external and laparoscopic video, as well as audio data. Video capture will offer a moment-to-moment account of each step and decision that a surgeon makes while operating, while the magnetic motion tracking technology will measure time and flow efficiency.

Dr. Pugh said the motion data can give participants an efficient, accurate summary of their operative decisions and preferences compared to a mastery database. The results also allow measurement of common factors that may be second nature to surgeons but can have a significant impact on efficiency and efficacy.

"This year, we will be able to deliver a snapshot report card

Participants from the Surgical Simulation Event at Clinical Congress 2019

to participants immediately after they complete the procedure," Dr. Pugh said. "It will show how their results compare with other surgeons, including the quality of their hernia repair."

Surgical Metrics: The Foundation of Surgical Mastery

After Clinical Congress, Dr. Pugh and her colleagues will perform a large-scale, deep dive into the data and draw some conclusions that can be used for feedback, quality improvement, operative efficiency, and patient safety. The purpose is to generate an ongoing conversation about the steps surgeons can take to share tips and tricks, develop evidence-based approaches, and improve outcomes. The larger the pool of participants from different institutions and with different levels of mastery, the more useful the findings will be.

The digital database will be used to answer a variety of questions, including:

- What decisions do surgeons make when faced with a surgical task?
- How do their decisions and technical approaches affect outcomes/hernia repair quality?
- Can this database serve as a benchmarking resource for trainees?
- Is there an expert strategy or evidence-based approach that can be discovered in the data and shared with participants?
- Can this database serve as a platform to discuss the possibility of longitudinal, personal assessment where participants track their own performance throughout their career?

If you haven't registered yet for Clinical Congress, there's still time. Go to *facs.org/clincon2022* or use the QR code for details.

Dr. Pugh also will deliver the I. S. Ravdin Lecture in Basic and Surgical Sciences on Monday, October 17, during Clinical Congress. She will speak on Wearable Technology and the Quantified Surgeon: The Forefront of Precision Surgery. ♦

ACS Initiates New Academic Global Surgery Fellowship

Hawassa University Hospital, where the new Academic Global Surgery Fellowship will address surgical disparities and accelerate research

To meet the challenges posed by the critical global health issue of lack of access to surgical care, the American College of Surgeons has partnered with three academic health systems to develop a new Academic Global Surgery Fellowship to address surgical disparities in underserved populations.

The ACS Operation Giving Back (OGB) program, together with the University of Utah Center for Global Surgery in Salt Lake City, Program for Global Surgery at Virginia Commonwealth University (VCU) in Richmond, and Hawassa University College of Medicine and Health Sciences in Ethiopia, will commit their distinctive capabilities to launch and support the fellowship program.

"This fellowship program will provide the next generation of surgeons with the opportunity to directly engage in research and quality improvement work at one of our leading training hubs in Hawassa, Ethiopia," said ACS OGB Director Girma Tefera, MD, FACS. "Fellows will conduct robust research in support of our long-term mission to reduce health disparities and improve the continuum of care for surgical patients."

The fellowship program, which began this summer, will build upon the efforts of an existing training program

"This fellowship program will provide the next generation of surgeons with the opportunity to directly engage in research and quality improvement work at one of our leading training hubs in Hawassa, Ethiopia."

—Girma Tefera, MD, FACS

established between the ACS OGB program and Hawassa University located in the east, central, and southern Africa regions. Since 2018, that program has focused on building surgical services, clinical care, quality improvement programs, and research at Hawassa University Hospital, a 480-bed referral hospital in Hawassa, Ethiopia, that serves a population of more than 18 million people.

During the COVID-19 pandemic, the research workgroup for the "Hawassa Hub"—one of ACS OGB's training programs consisting of Hawassa University faculty members and members of US consortia schools—organized virtual training activities and discussions on ways to improve surgical research in Hawassa. The Academic Global Surgery Fellowship program will accelerate all efforts by fostering interdisciplinary and multidisciplinary collaborations centered on surgical training, research, and education.

Improving Access, Quality, and Research

Each year, fellows will be selected from either the University of Utah or VCU for a 1-year appointment. Fellows will facilitate research, conduct educational and quality improvement programs, disseminate results and data, create a mentoring relationship, and increase academic output at Hawassa University Hospital. To build lasting partnerships and produce impactful research, fellows will travel to Hawassa for 3 to 6 months over the course of the fellowship, and they also will be invited to participate in advocacy campaigns. Their research will be presented at related conferences and will be documented in a final year-end report.

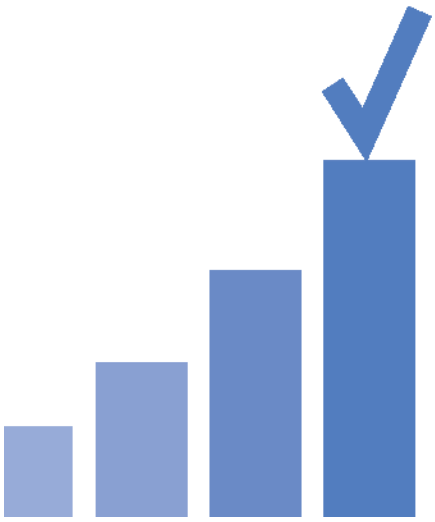
Anteneh Gadisa, MD, FCS-ECSA, FACS, chief executive director, Hawassa University College of Medicine and Health Sciences, noted that the program will add meaningful depth to an already productive collaboration. "It will create an opportunity both for the fellow and Hawassa faculty to learn from each other and work on selected projects, thereby helping to bring the intended changes in the clinical, academic, and research activities at Hawassa University," he said.

By understanding the challenges in surgical education and clinical care in Ethiopia and collectively developing, implementing, and analyzing actions, the program will "produce measurable and sustainable impact in healthcare," added Edgar Bruck Rodas, MD, FACS, an associate professor in the division of acute care surgical services at VCU and director of the VCU Program for Global Surgery.

Sudha P. Jayaraman, MD, MSc, FACS, a professor of surgery and director of the University of Utah Center for Global Surgery, has witnessed firsthand how research and effective programming can help reduce global health disparities. Her work on trauma epidemiology and systems development in East Africa has focused on addressing disparities in trauma mortality. For Dr. Jayaraman, the fellowship program fills an acute need in reducing global health surgical disparities and offers fellows an important stepping stone in their careers as surgeons.

"We look forward to helping participants learn the fundamentals of surgical systems across resource settings, providing strong mentorship across institutions, and preparing them to develop impactful careers in academic global surgery," she said.

For more information about the fellowship and related programs, visit the ACS Operation Giving Back web page at *facs.org/ogb*. ♦



Apply for 2023–2025 ACS Clinical Scholar in Residence Positions by October 31

The ACS is now accepting applications for the 2023–2025 Clinical Scholar in Residence positions. Applications are due Monday, **October 31, 2022**.

This 2-year, onsite fellowship affords the selected ACS Clinical Scholars the opportunity to get involved in surgical outcomes research, health services research, healthcare policy, diversity, equity and inclusion, and quality improvement. The Scholar will work in multiple areas within the ACS Division of Research and Optimal Patient Care (DROPC) to advance the quality improvement initiatives of the ACS and to perform research relevant to projects within the ACS.

Five fellowship spots are available for July 1, 2023–June 30, 2025, with a focus in Cancer, Trauma, and other areas of surgery. The spots include one position with the ACS Cancer Programs, one position with the ACS Committee on Trauma, and three positions with ACS general surgery programs.

Continuing Your Education

The goal of the ACS Clinical Scholar in Residence Program is to help prepare a surgical resident for a career in academic surgery through a unique, practical research and health policy experience at the ACS. The program includes the opportunity to earn a masters of science in clinical investigation (MSCI), health services and outcomes research, or healthcare quality and patient safety through Northwestern University's Schools of Medicine, Public Health, and the Institute for Healthcare Studies.

In addition, the scholar will be able to participate in resident educational activities through the Northwestern University Department of Surgery. The ACS offers a variety of educational programs, such as the Outcomes Research and Clinical Trials Courses that the Scholar will be able to complete. The scholar also will interact and be mentored by various surgeons affiliated with the ACS and DROPC from across the country and be supported by ACS staff statisticians and project analysts.

Applicants must have completed 2 years of clinical training, be a US citizen, and obtain approval from their home institution to be considered. Interviews will be scheduled over video conference in October.

Visit the Clinical Scholars in Residence web page at *bit.ly/3AP2auY* or scan the QR code for more information on specific positions and application requirements, as well as a list of mentors and other scholars. For more information, email cscholars@facs.org. ♦

ACS QUALITY and SAFETY CONFERENCE
July 15–18, 2022 | Chicago, IL

2022 ACS QSC Focuses on Enhancing Surgical Quality Improvement

Matthew Fox, MSHC

For the first time since 2019, the ACS Quality and Safety Conference was an in-person event, July 15–18 in Chicago, IL. The approximately 1,000 in-person attendees and more than 400 virtual attendees participated in a wealth of learning opportunities—from deep dives on the new ACS Quality Verification Program (QVP) to tips on standardization, addressing planetary health in surgery, leadership pearls, and achieving quality through health equity.

The live program also offered attendees the opportunity to meet old friends and network with new colleagues, providing content and activities of interest to all members of the surgical quality and patient safety team.

The on-demand platform for the Quality and Safety Conference will remain open until **October 15, 2022.** You can access the 31 online sessions at *eventscribe.net/2022/ACSQSC*.

This article summarizes a small selection of sessions offered this year; sessions available to view on-demand are indicated with an asterisk (*).

See more on-demand offerings in the sidebar on page 61.

Opening Session

At the conference's opening session, Clifford Y. Ko, MD, MS, MSHS, FACS, FASCRS, Director, ACS Division of Research and Optimal Patient Care, spoke about the three-part quality and safety paradigm that would inform the conference's varied sessions. This paradigm requires the surgical team to:

- Always provide the best patient care possible
- Evaluate data and metrics to learn where care is already good, but also where it is not at the level you want it to be
- Use evidence-based, effective models to improve

"If you want to have useful, sustained quality improvement, you need to conduct improvement well," Dr. Ko said. "If we don't conduct improvement well, we won't improve, and we won't change."

Dr. Clifford Ko

Big Problems in Cancer panel, from left: Dr. Mullett, Megan Burns, and Dr. Rachel Joung

Workshop attendees

How Can Quality Improvement Projects Address Big Problems in Cancer?

As most quality improvement (QI) projects focus on finding long-term solutions to existing issues, QI initiatives are a natural for addressing the big issues in cancer care. Timothy Mullett, MD, FACS, Chair, ACS Commission on Cancer, spoke on creation of a new process to evaluate and monitor tobacco in cancer patients in Kentucky, which leads the US in many cancers and risk factors. Dr. Mullett and his colleagues developed a PDSA (plan-do-study-act) process to study rates of smoking at diagnosis versus smoking at follow-up by focusing on a simple step—making sure care teams are asking their newly diagnosed cancer patients if they smoke.

"We were surprised by how few patients were being asked this question, which has significant implications for patient interactions, smoking cessation initiatives, and treatment right from the beginning," Dr. Mullett said.

The COVID-19 pandemic also presented novel challenges in cancer care, which Richard Bleicher, MD, professor of surgical oncology at Fox Chase Cancer Center in Philadelphia, PA, and colleagues examined in the context of Patient-Reported Observations on Medical Procedure Timeliness. Dr. Bleicher's ongoing study sought to understand the patient perspective on the timeliness of breast cancer diagnosis and first treatment during the pandemic using surveys and interviews.

Rachel Joung, MD, MS, FACS, a resident at Northwestern University in Chicago, provided an update on the ACS's nationwide return to cancer screening study and PDSA intervention, which is aimed at bringing screening back to pre-pandemic levels. Most facilities had deficits, she said, but through improving communication within communities, increasing provider delivery capabilities, and increasing community access to screenings, most participating sites reached target goals within 6 months—and some even increased screening rates.

Other cancer care organizations are continuing to work on improving quality, as Megan Burns, program manager of national health systems and organizations at the American Cancer Society, discussed. Specifically, she spoke on how the "two ACSs" are using evidence-based interventions (EBIs) to increase the likelihood of successful cancer screening initiatives and improve their value, noting that the previously discussed return to cancer screening initiative was a successful EBI.

What You Need to Know about the ACS QVP*

The development and implementation of the ACS QVP was one of the thematic foci of the conference, and several program experts shared their thoughts on the key elements of the comprehensive QI program.

As discussed by Chelsea Cardell, MD, MS, clinical scholar and resident at Loyola University Medical Center in Maywood, IL, the 12 standards of QVP create a universal framework for ongoing QI in a hospital by using the programmatic standards grouped into four domains: leadership, care, evaluation, and improvement. Leadership focuses on engaging surgical quality and safety staff and creating a culture based on patient safety and high reliability; the care domain standardizes team-based processes in the five phases of care (preoperative, immediate preoperative, intraoperative, postoperative, and postdischarge); the evaluation phase looks at data collection, surveillance, and case and surgeon review; the improvement phase focuses on continuous

"The ACS QVP socializes quality across surgical specialties and across health systems" by providing easily communicated data.

—James W. Fleshman Jr., MD, FACS, FASCRS

quality improvement using data and compliance measures.

But what are the specific advantages of participating in the ACS QVP, especially when a hospital may already be participating in other ACS Quality Programs? ACS Regent James W. Fleshman Jr., MD, FACS, FASCRS, chair of surgery, Baylor University Medical Center, Dallas, TX, explained how participating in a QVP pilot site review helped his large health system improve even further.

The initial review revealed "significant opportunities for improvement," Dr. Fleshman said, noting that, because of the QVP, Baylor was able to construct a mission, vision, values, and strategy for a culture of safety; incorporate residents into the five phases of care touched by continuous QI; get targeted ACS NSQIP (National Surgical Quality Improvement Program) data to surgeons; create a health system science review process; and more. Importantly, Dr. Fleshman noted, "the ACS QVP socializes quality across surgical specialties and across health systems" by providing easily communicated data.

A QI program as comprehensive and thorough as the QVP cannot succeed without buy-in from all necessary parties, ranging from nurses to hospital

NOTABLE QUALITY AND SAFETY CONFERENCE SESSIONS AVAILABLE ON-DEMAND

Surgical Quality: Fact Versus Fiction

SQOs and hospital leaders from around the country in both academic and community hospitals settings share their insights after they dug deep to find out how quality is defined, practiced, and implemented across different surgical departments in their hospital.

Current Affairs in the Children's Surgery Program

This session provides an update on the Children's Surgery Verification (CSV) program and overview of the CSV Consultation program. Viewers will hear from a newly verified center that participated in the Consultation Pilot and from a newly verified Level II center, as well as receive advice and direction on preparing for a successful CSV site visit.

Making the Transition from ACS NSQIP to the ACS NSQIP Quality Verification Program

Surgeons leading quality within NSQIP hospitals discuss their experiences in their roles as the Surgeon Champion and SQO within the context of the new ACS NSQIP QVP.

Quality Care Is Equitable Care: A Call to Action to Link Quality to Achieving Health Equity

This session focuses on how health equity is linked to quality patient outcomes; the economics of achieving health equity within a health system; and how to develop and implement a health equity framework within organizations for institutions and local providers to ensure the equity is included as a component of a quality.

100 Years of Quality

The ACS COT and ACS Cancer Programs are celebrating their 100-year anniversaries in 2022. Speakers share the most important findings these programs have brought to light and discuss their impact on patient lives nationally and globally.

Leadership Pearls panel, from left: Drs. Patricia Turner, Vivian Gahtan, Caroline Reinke, and Feibi Zheng

executive staff, according to Robert J. Winchell, MD, FACS, professor of surgery and chief of trauma, burn, acute and critical care, Weill Cornell Medicine, New York, NY. To get buy-in, Dr. Winchell advised to "start with your core team—the people with the responsibility to pull the initiative off," including the surgical quality officer (SQO) or QI leader, chair of surgery, or NSQIP champion. The team must be intimately familiar with the QVP and be able to communicate why it is important to a broad range of stakeholders who might not have strong commitments to the ACS or QI. Dr. Winchell summarized how to approach "strong supporters," "lukewarm defenders," and even "enemies" who might actively resist the program so that consensus can be reached, and the QI transformation can begin.

Leadership Pearls*

One highlight of the conference was the Leadership Pearls General Session and panel discussion, moderated by Patricia L. Turner, MD, MBA, FACS, ACS Executive Director. In their talks, the three panelists described their leadership philosophies and provided tips on successfully navigating high-level surgical careers.

Vivian Gahtan, MD, FACS, chair, department of surgery, Loyola Medicine, Maywood, IL, noted the importance of leading with the team in mind. "Real success is team success," Dr. Gahtan said. "You need to be a leader who is focused on that—creating good conditions to have your people realize their capacity and power."

To be that leader, Dr. Gahtan suggested preparing by gaining information about the role and the team, setting goals, developing leadership strategies, and setting aside time to develop skills, education, and a portfolio.

Even in difficult team situations, it should be a priority for leaders to keep its members working together. "You do not all need to agree on everything, but everyone should feel like they are being heard," said Caroline Reinke, MD, FACS, associate professor and quality officer, Atrium Health, Charlotte, NC.

Dr. Reinke suggested that leaders need to balance trust and transparency with their teams and manage conflicting priorities, which can be difficult among the team's varying responsibilities. However, what does not change is the importance of always making sure to support the team. "No matter what, it's critical to protect the team, always," she said.

An important part of becoming a leader is honing your negotiation skills, according to Feibi Zheng, MD, MBA, FACS, assistant professor of surgery at Baylor College of Medicine in Houston, TX. "In your negotiations, listen actively and be genuinely curious about what your partner is saying," Dr. Zheng said.

In situations where emotions can flare, "make sure to acknowledge that emotion and not ignore it." By approaching your counterpart in a spirit of cooperation, Dr. Zheng said that all parties are better equipped to get what they want.

After their talks, Dr. Turner led a Q&A in which she asked the panelists how they generate team buy-in with high-level organizational decisions that they may not be happy with, navigating culture change when one is relatively new at an institution, and the importance of wellness, resilience, and team cohesiveness.

Improving Quality, Access, and Equity with Telehealth*

The pandemic changed many facets of healthcare in the US, including the use and proliferation of telehealth services

Workshop group breakout session

Conference attendees

within surgery—and it is helping to improve quality, access, and equity, panelists suggested.

Telehealth has the potential to improve availability of care in all surgical specialties, including trauma, according to John Kirby, MD, FACS, a trauma surgeon at Washington University School of Medicine in St. Louis, MO. He specifically discussed how the advent of the electronic intensive care unit (EICU) has the potential to change the practice of trauma care. The EICU introduces a suite of digital tools, including cameras throughout the ICU, digital workstations for surgeons, and communication technology to help surgeons visit and interact with patients and staff from a remote location. Dr. Kirby explained that a trauma surgeon can operate cameras to look around the room and see necessary vitals and view patients up close to guide decision-making, all of which improves communications with onsite staff and patients alike. And patients will benefit from more equitable access to skilled surgeons and caretakers when physical presence of the practitioner is less of a concern, Dr. Kirby suggested.

One of the most touted benefits of telehealth is how its availability increases access to preoperative and follow-up care, and Jyortirmay Sharma, MD, FACS, FACE, Chair, ACS Board of Governors Telehealth Workgroup, suggested that this has proven true within surgery. Dr. Sharma spoke about how telehealth fits into the digital health paradigm, providing videoconferencing, imaging transfer, remote monitoring of vitals, and nursing call centers to offer ever-expanding options for patients in surgery access to health care.

There are several "pros" for telehealth in surgery, such as decreased readmissions after surgery, decreased duplication of services among support staff, and robust photo tracking for wound care. And ultimately, Dr. Sharma noted, there are many definitions of healthcare quality, but "meeting customer expectations" is always important—and telehealth is helping surgeons to do just that.

While there have been concerns that telehealth may prove to be a "flash in the pan" technology for surgery, "it is here to stay," said Andrew Watson, MLitt, MD, FACS, medical director, telemedicine, University of Pittsburgh Medical Center, PA. Early evidence has suggested that telehealth can aid in the provision of safe and high-quality care, Dr. Watson said, adding that "cultural change should help us to lean into telemedicine." He discussed major consumer electronics companies, such as Google and Apple, as "driving forces in telehealth" adoption, which have changed public perception about accepting health information digitally.

In healthcare specifically, telehealth has positive implications for all levels of healthcare, he said, noting that patients have improved access to care, better care coordination, and lessened travel expenses, while physicians have improved access to data and education, as well as improved clinic efficiency and more.

Things You May Not Know, but Wish You Did*

In this session, speakers provided an overview of three hot topics in surgical quality and patient safety.

The multidisciplinary nature of cancer care and surgical oncology means that many healthcare professionals get involved with treating a patient—and all those hands being involved means there is a lot of room for variability, which is suboptimal for improving quality of care. But checklist-based synoptic operative reports help to standardize care through standardizing patient

"Planetary health is a realization that for our patients to be healthy, they need clean air, clean soil, clean food—they need an environment they can survive in."

—Husein Moloo, MD, FACS

medical reports, according to Heidi Nelson, MD, FACS, Chair, ACS Cancer Programs.

"Operative reporting, as I've come to understand it, is more than just a record," Dr. Nelson said. "It is a source of communication, and communication is so important in how we deliver team-based care." The checklist approach of synoptic reporting offers clear team communication through standardized terminology, a familiar format, and discrete data capture that is easier to read and disseminate than narrative reporting. "When you do an operation the right way, following best practices, you get the best result," Dr. Nelson said, suggesting that synoptic reporting provides a way to replicate best practices by providing actionable, replicable data to other professionals.

One of the baseline requirements for lasting QI, in synoptic reporting and other initiatives discussed at the conference, is having a leader to initiate, coordinate, and monitor projects, and that role is most effectively filled by an SQO. Elizabeth Wick, MD, FACS, vice-chair of quality and safety, University of California, San Francisco (UCSF) Center for Colorectal Surgery, discussed the role of SQOs in QI.

To support her point, Dr. Wick described her experience at UCSF as a part of a QI initiative to reduce the incidence of retained wound sponges in 2017. She noted that an initial project did reduce the rate of retained sponges, but the number increased again in 2020.

"Clearly, we needed a lasting change," Dr. Wick said. She broke down how UCSF worked on this issue and described how an SQO helped facilitate some of the necessary relationships among disparate groups, such as the director of perioperative informatics and so-called ancillary positions. The work of the SQO helped to develop a Quality and Safety Council, the members of which helped to guide an ongoing QI initiative by engaging members of their respective areas.

All surgical QI projects are worthwhile, necessary endeavors for improving patient safety and outcomes. But according to Husein Moloo, MD, FACS, program director, colorectal surgery, University of Ottawa, ON, there is now a need to look beyond the operating room and into the environment itself to find some of the most significant opportunities for improving both patient health and planetary health.

"Planetary health is a realization that for our patients to be healthy, they need clean air, clean soil, clean food—they need an environment they can survive in," Dr. Moloo said, explaining that he and his department began to look at larger societal issues that impact surgical health to make the biggest impact. And, he explained, QI can play a significant role in improving planetary health by addressing the outsized carbon footprint that surgery has in the healthcare system. Healthcare accounts for 10% of greenhouse gas emission in the US, he said, and surgery contributes a major part of those admissions through use of tools and anesthesia.

Dr. Moloo discussed how an overarching theme of his department has become decreasing their carbon footprint and that reducing inappropriate care will save both money and resources, such as single-use plastics. The ACS and its Quality Programs are well-positioned to move this work ahead in the US, he said.

Why Is Standardization So Difficult?*

The difficulty of standardization is an enduring challenge of implementing successful, long-lasting surgical QI, but

Standardization panel, from left: Session moderator Amalia Stefanou, MD, FACS, FASCRS, Drs. Lillian Kao, Kristen Ban, and Mark Katlic

it is a challenge that needs to be confronted, according to Lillian S. Kao, MD, MS, professor of surgery, McGovern Medical School, The University of Texas Health, Houston. Standardization decreases variance and increases quality and cost-effectiveness.

When looking at the existing clinical practice guidelines (CPGs) for potential adoption at a hospital—the CPGs that are evidence-based, promote stakeholder engagement, and are based on external review—the SQO and surgical quality team must take their institutions' unique needs into account. "Not only can you select a guideline that fits your criteria, including your local ones, you can and should adapt it," Dr. Kao said. Within a local context, a hospital's CPG implementation strategies must balance effectiveness and feasibility to be successful and, therefore, valued as a standardization template.

Kristen Ban, MD, MS, FACS, a colorectal surgeon at the Cleveland Clinic, OH, discussed the ACS Agency for Healthcare Research Quality Safety Program for Improving Surgical Care and Recovery (ISCR). The program's first cohort, 341 unique hospitals, took up processes to standardize the implementation of enhanced recovery pathways (ERPs) for more than 50,000 colorectal surgery cases. ERPs improve outcomes and decrease healthcare utilization by reducing variation in care, Dr. Ban explained.

Participating hospitals worked to build consensus for the ISCR pathway, held multidisciplinary meetings, and partnered with senior leaders; however, "many hospitals were unable to achieve high compliance with the ERP," Dr. Ban said, noting that only 20% had full adherence. "That is a problem, because we know that full adherence is associated with significantly lower rates of negative clinical outcomes except venous thromboembolism." The primary lesson learned was that data needed to be shared with frontline workers to promote uptake of ERPs in the work process from the bottom up.

The need to standardize care that accounts for frailty for geriatric surgery patients is particularly acute. However, the sheer volume of existing standards makes the process difficult, said Mark Katlic, MD, MMM, FACS, surgeon-in-chief, Sinai Hospital, Baltimore, MD. "Frailty predicts survival for this population," he said, and "so many frailty standards exist, but most are too complex for daily care."

Dr. Katlic discussed some of the frailty assessments in use today and explained that Sinai Hospital sought to create a simple preoperative tool to assess geriatric frailty risk. The Sinai Abbreviated Geriatric Evaluation (SAGE) uses only a few key points, including gait speed and ability to perform activities necessary for daily living, and has been an effective tool, he explained. The SAGE assessment was made possible through the work of the ACS Geriatric Surgery Verification (GSV) Program and meets the specific standards for the GSV vulnerability screens. As Dr. Katlic noted, "Something practical is better than something perfect that is never used."

The next ACS Quality and Safety Conference will take place July 10–13, 2023, in Minneapolis, MN. ♦

MATTHEW FOX is Digital Managing Editor, Division of Integrated Communications, Chicago IL.

The Operative Word

New from the *Journal of the American College of Surgeons*

The Operative Word is a new podcast during which, hosts Jamie Coleman, MD, FACS, and Dante Yeh, MD, FACS, speak with recently published authors about the motivation behind their latest research and the clinical implications it has for the practicing surgeon.

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ACS AMERICAN COLLEGE OF SURGEONS

Report on ACSPA/ACS Activities, June 2022

by Danielle Saunders Walsh, MD, FACS, FAAP

The Board of Directors of the American College of Surgeons Professional Association (ACSPA) and the ACS Board of Regents (B/R) met June 10–11, 2022, at the College's headquarters in Chicago, IL. The following is a summary of key activities discussed. The information provided was current as of the date of the meeting.

ACSPA

As of May 20, during the 2022 election cycle (January 1, 2021–December 31, 2022), the ACSPA Political Action Committee (ACSPA-SurgeonsPAC) had raised more than $480,000 from more than 770 College members and staff and disbursed $429,000 to more than 105 congressional candidates, political campaigns, and other PACs. SurgeonsPAC continues to prioritize a balanced, nonpartisan disbursement strategy, including support for Democrats and Republicans. Distribution of funds is focused on health professionals, key congressional leaders, and members who serve on important US House and Senate committees with jurisdiction over various healthcare policies and procedures, including ACS-supported legislative priorities.

ACS

The Board of Regents accepted resignations from 11 Fellows and changed the status from Active or Senior to Retired for 149 Fellows. The Regents also approved the formation of the Bahrain Chapter.

Division of Education

A strategic analysis of the Division of Education programs was conducted to review the status of activities, including an overview of the structure and staff, programs, attendance, and measurements of success, and identify strategies to increase users of ACS education programs and document the programs' value proposition.

Reviewed initiatives included:

- Programs aimed primarily at practicing surgeons and surgery faculty
- Programs aimed primarily at medical students, surgery residents, surgical teams, and patients and caregivers
- Accreditation, verification, validation, and recognition programs
- Research, scholarship, innovation, and mentoring programs

Workgroup recommendations presented and discussed included:

- Exploring the expansion of the iconic programs, nationally and internationally
- Leveraging technology in the development and delivery of educational programs
- Segmenting and surveying potential users of educational programs
- Establishing new databases, mining existing databases, and establishing new collaboration opportunities
- Increasing focus on multispecialty education, interdisciplinary education, and teamwork
- Documenting the value proposition of current and new educational programs
- Appointing a Regental Advisory Committee for the Division of Education

Division of Information Technology

The Division of Information Technology (IT) continues to support improvements for the membership's experience via better applications and the management, analysis,

and security associated with these applications.

In collaboration with the Division of Integrated Communications (IC), IT worked with external vendors and internal stakeholders to launch a new ACS website, ensuring information can be quickly found in an intuitive, contemporary design. IT ensured the website is seamlessly and securely integrated with the College's membership data and third-party vendors to advance usability. A new e-commerce solution will be launching to provide a smooth and predictive commerce experience. The e-commerce solution will allow members and guests to maintain credit cards securely on file to purchase products, conduct registration, and obtain online learning without the need to reentering card information.

IT continues to work with the Division of Education to meet the technological challenges of a hybrid model for Clinical Congress 2022.

Division of Research and Optimal Patient Care

The Division of Research and Optimal Patient Care (DROPC) encompasses the areas of Continuous Quality Improvement (CQI), including ACS research and the accreditation programs.

Quality and Safety Conference

The 2022 Quality and Safety Conference (QSC) was held July 15–18 in Chicago. Highlights included sessions on Improving Surgical Outcomes for Older Adults, Leadership Pearls, Quality Care Is Equitable Care, and Why Is Standardization So Difficult? 100-year anniversary celebrations also continued for the ACS Committee on Trauma and ACS Commission on Cancer.

ACS Quality Improvement Course: The Basics

The ACS Quality Improvement Course: The Basics, launched in November 2021 and is intended for surgeons and other quality improvement (QI) staff interested in improving quality at their hospitals. The self-paced online course consists of six modules and an exam. Each module includes text, videos, interactive e-learning components, knowledge check questions, and workbook activities. After completing the course, participants should understand the basic principles of surgical quality and safety. Currently, more than 75 people have successfully passed the course. A single-day workshop highlighting the course content was held each day at the 2022 QSC.

Optimal Resources for Surgical Quality and Safety

In 2017, the College released the *Optimal Resources for Surgical Quality and Safety* manual, also called the "Red Book." More than 10,000 manuals have been distributed since its release. The manual served as source material to develop new standards and an adjunctive verification program, the ACS Quality Verification Program (ACS QVP). The ACS QVP formally launched in July 2021, and multiple participation options are now available to interested hospitals, with additional participation options for hospital systems and ACS National Surgical Quality Improvement Program (ACS NSQIP®) participants available in the future. The ACS QVP offers a proven, standardized method for establishing, measuring, and improving a hospital's quality infrastructure across all surgical departments. The College announced the first 25 QVP hospitals that have met the standards at the 2022 QSC.

ACS NSQIP

A total of 860 hospitals participate in the College's ACS NSQIP—707 in the adult option. The pediatric option represents

18% of overall participation. At present, 155 hospitals outside of the US participate in ACS NSQIP.

MBSAQIP

In April, the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) released a revised version of the MBSAQIP Standards, *Optimal Resources for Metabolic and Bariatric Surgery 2019*. The revisions provided clarification regarding adolescent surgery guidelines for metabolic and bariatric surgery within the context of a MBSAQIP-Accredited Center, clarification around metabolic and bariatric surgery credentialing guidelines, and the requirements for adverse event review in the event of patient mortality within 90 days of surgery.

Children's Surgery Verification Program

The Children's Surgery Verification (CSV) Quality Improvement Program launched in 2017 with the goal of ensuring that pediatric surgery patients have access to quality care. A total of 153 centers participate in CSV. Approximately 35 of these centers are in various stages of verification; 45 of the active sites are fully verified as Level I children's surgery centers. All 153 centers participate in ACS NSQIP Pediatric.

Geriatric Surgery Verification Program

The Geriatric Surgery Verification (GSV) Quality Improvement Program launched in 2019 to ensure that older surgical patients have access to high-quality care. At present, 52 hospitals have applied for one of the three levels of participation: Level 1 verification—Comprehensive Excellence; Level 2 verification—Focused Excellence; and Commitment Level. Hospitals seeking Level 1 or Level 2 verification must demonstrate all 30 GSV Program standards are in place through a comprehensive site visit. These visits confirm hospitals comply with the required structure, processes, and standards of care as outlined by the program. To date, three hospitals have successfully completed virtual site visits and achieved Level 1 verification—Comprehensive Excellence.

ISCR Program

The Agency for Healthcare Research and Quality (AHRQ) Improving Surgical Care and Recovery (ISCR) Program, a collaborative effort between the ACS and The Johns Hopkins Armstrong Institute for Patient Safety and Quality in Baltimore, MD, continues to attract hospitals interested in implementing enhanced recovery practices. Hospitals participating in ISCR receive a ready-to-use pathway, access to education materials on implementing the pathway, access to experts in performance improvement and education to help with troubleshooting, and inclusion in a community of professionals rolling out the same pathway. Approximately 60% of enrolled hospitals participate in ACS NSQIP. More than 350 hospitals have participated in the program. Enrollment in ISCR is now closed to new sites, but the program will continue until December 2022.

Strong for Surgery

Strong for Surgery (S4S), a joint program of the ACS and the University of Washington in Seattle, is a quality initiative aimed at identifying and evaluating evidence-based practices to optimize the health of patients before surgery. The program empowers hospitals and clinics to integrate checklists into the preoperative phase of clinical practice for elective

operations. Since its release in 2017, S4S has more than 700 participating sites. The goal is to move the patient-facing version to an online platform for patients to complete before meeting with their surgeon.

SSR

The Surgeon Specific Registry (SSR™) allows surgeons to track their cases, measure outcomes, and comply with changing regulatory requirements. The SSR can be used to meet the requirements of the Centers for Medicare & Medicaid's Quality Payment Program Merit-based Incentive Payment System, as well as the American Board of Surgery's Continuous Certification Program requirements. The SSR has an active user base of approximately 7,250 surgeons, and more than 12.6 million case records have been entered in the SSR system since its release in 2017. The SSR is now offering the "SSR Practice Improvement Initiative (SSR PII) 2022—Quality Case Data Review and Reflection 2022" to allow surgeons to perform quality data assessment and CME. The first 2022 PII cycle had 147 surgeon participants, and the next cycle will run between July through December.

ACS COVID-19 Registry

The ACS COVID-19 Registry launched in April 2020 to respond to the requests of ACS NSQIP-participating sites to track COVID-19 patients. The ACS COVID-19 Registry is free for any hospital and was created in Research Electronic Data Capture (REDCap). Hospitals participating in the ACS COVID-19 Registry enter data variables covering demographics, severity predictors, admission information, hospitalization information, therapies used, and discharge information. Participating hospitals capture data on all patients ages 18 and older and are tracked from hospital admission through discharge. Approximately 70 hospitals participate and have submitted more than 20,000 cases. Participating sites can download their data at any time to look for trends or areas for quality improvement.

Trauma Programs

The Committee on Trauma's (COT) Diversity, Equity, and Inclusion (DEI) Workgroup is collaborating with several societies on efforts to ensure broad representation in nominees for opportunities such as membership in the COT and participation in the Future Trauma Leaders Program. The COT also is partnering with other trauma organizations to address DEI issues such as improving pathways to a career in trauma surgery.

The 2021 *National Field Triage Guideline* is now available. The Spring 2022 TQIP (Trauma Quality Improvement Program) Benchmark Reports were released earlier this year for Adult, Pediatric, Level III, and Collaborative product lines. The TQIP Mortality Reporting System has four case studies and is expected to be published soon. Trauma Quality Program Best Practice Guidelines in the areas of Mental Health and Substance Abuse, and Geriatrics are in development.

A new brochure, *Gun Safety and Your Health: A Proactive Guide to Protect You and Those Around You,* offers tips for patients and the public on how to keep families and communities safe from firearm injuries and death. Healthcare providers are encouraged to share the brochure and engage in discussions around firearm injury prevention and safety.

The MyATLS App redesign project is under way and expected to be completed in early 2023. The ATLS 11th Edition Revision project launched in July 2022.

Anticipated changes include the organization of the Core Content of the Student Manual, a redesign of the mATLS online modules, and a re-examination of business and distribution plans to manage scalability and sustainability for the future.

Shelbie Kirkendoll, MD, has been selected as the 2022–2024 ACS COT Firearm Injury Prevention Clinical Scholar.

The 2022 TQIP Annual Conference, December 11–13 in Phoenix, AZ, will bring together trauma medical directors, program managers, coordinators, principal investigator clinicians, and registrars from participating and prospective TQIP hospitals and provide attendees the opportunity to network with key leaders from trauma centers around the country. Stephen Trzeciak, MD, MPH, an intensivist, clinical researcher, and author of the books *Compassionomics* and *Wonder Drug: 7 Scientifically Proven Ways that Serving Others Is the Best Medicine for Yourself,* will serve as the keynote speaker.

The STOP THE BLEED® (STB) program continues to focus on empowering, educating, and informing individuals in bleeding control techniques. The STB program provides training, both virtually and in-person, on the importance of learning the lifesaving skills to deploy in a bleeding emergency. The STB program continues to promulgate the initiative globally, creating awareness throughout communities worldwide. The STB program has trained 1.9 million individuals with 100,000 global instructors. A robust social media campaign to raise awareness was held in May to promote National Stop the Bleed Month. In April, the instructor categories for the STB program were expanded to include non-healthcare professionals. The STB program will hold in-person courses at Clinical Congress 2022.

Office of Diversity, Equity, and Inclusion

The Office of DEI continues to develop its infrastructure and strategic framework. Major activities, include working with the 10 research teams who received the ACS Regental Innovative Grant for Diversity, Equity, Inclusion and Anti-Racism to ensure alignment of the research project with ACS strategic priorities, provide resources for a midyear status report from each research team, and include the grant recipients in other relevant ACS DEI initiatives.

The ACS DEI Educational and Alignment (E&A) Collaborative was launched in May to offer educational workshops for members and staff who are vested in developing and distributing DEI efforts. The E&A Collaborative provides a continuum of learning opportunities on the fundamentals of DEI presented by subject matter experts. The E&A Collaborative will serve as a DEI think tank by engaging participants in interactive workshops, understanding the core tenets of DEI, and connecting the DEI work to ACS organizational values and objectives.

ACS Foundation

The ACS Foundation remains focused on securing and growing financial support for the College's charitable, educational, and patient-focused initiatives. Through May 24, the Foundation had raised $1,992,733 in donations and grant support. Individual donations totaling $894,762 were secured, a 6-year high, $287,223 supporting Greatest Needs with those monies being directed toward scholarships.

Programs, projects, and initiatives received $1,705,510. Corporate support reached

$236,187, focusing on support of educational surgical programs at Clinical Congress 2022.

Operation Giving Back, STB training in rural communities, international scholarship travel awards, and fellowship research awards, as well as the ACS Greatest Needs Fund continue to be supported by generous philanthropic gifts from Fellows.

The FTL100 Campaign, launched to celebrate the centennial of the COT and to provide long-term support for the FTL Program, concluded and surpassed its donation goal of $1,000,000, with a total of more than $1,265,000. The funds will be used to provide leadership training and mentoring opportunities to young trauma surgeons. ♦

DR. DANIELLE SAUNDERS WALSH is professor of surgery at the University of Kentucky in Lexington, and chief medical officer of Pirate Surgery in Greenville, NC. She is the Chair, ACS Board of Governors.

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