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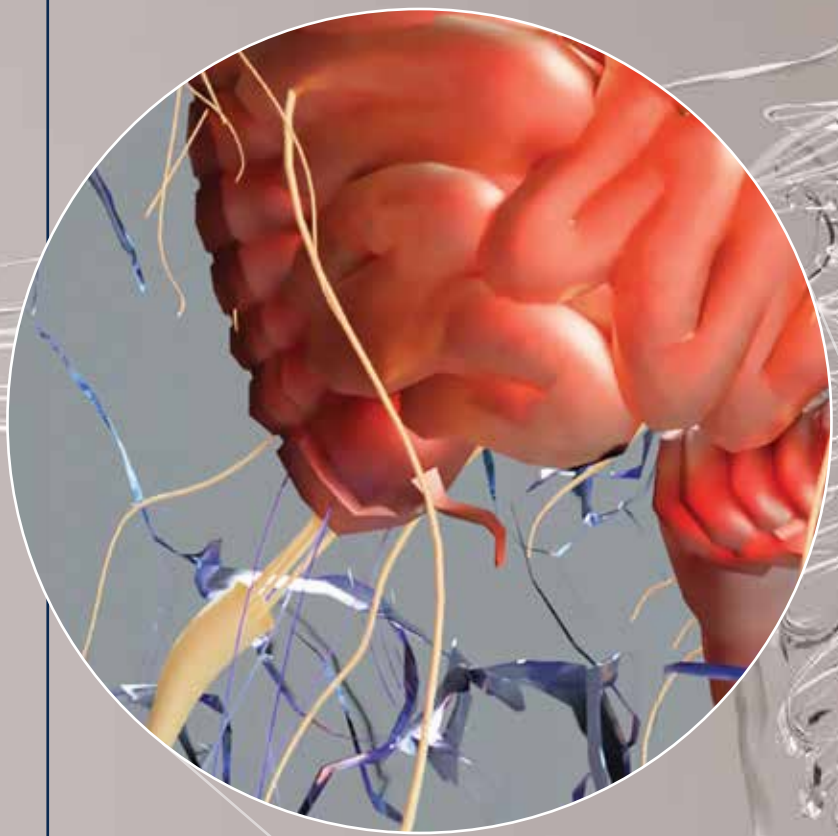
ACS Bulletin

AMERICAN COLLEGE OF SURGEONS



Are Antibiotics the Answer to Treating Appendicitis?

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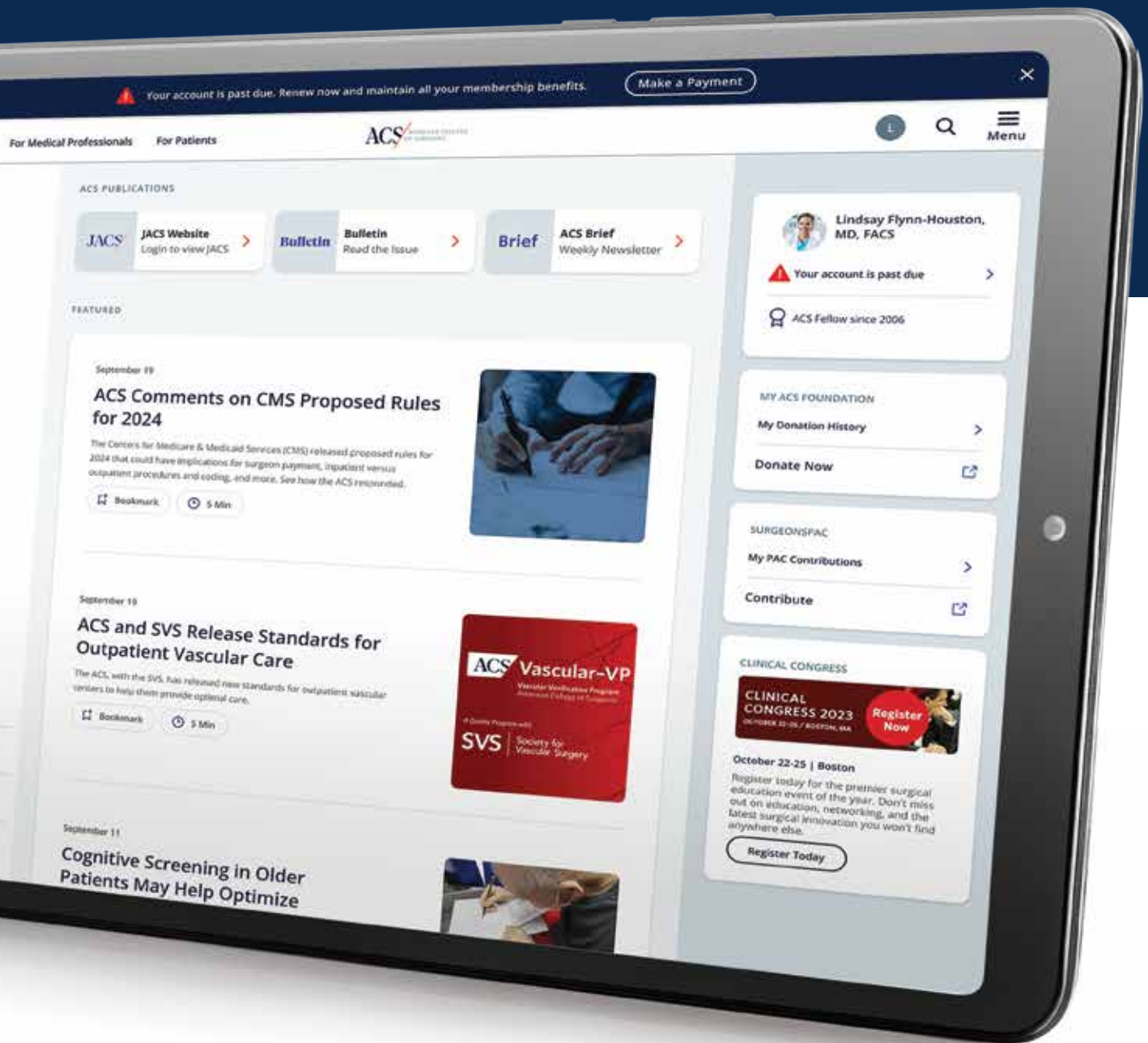

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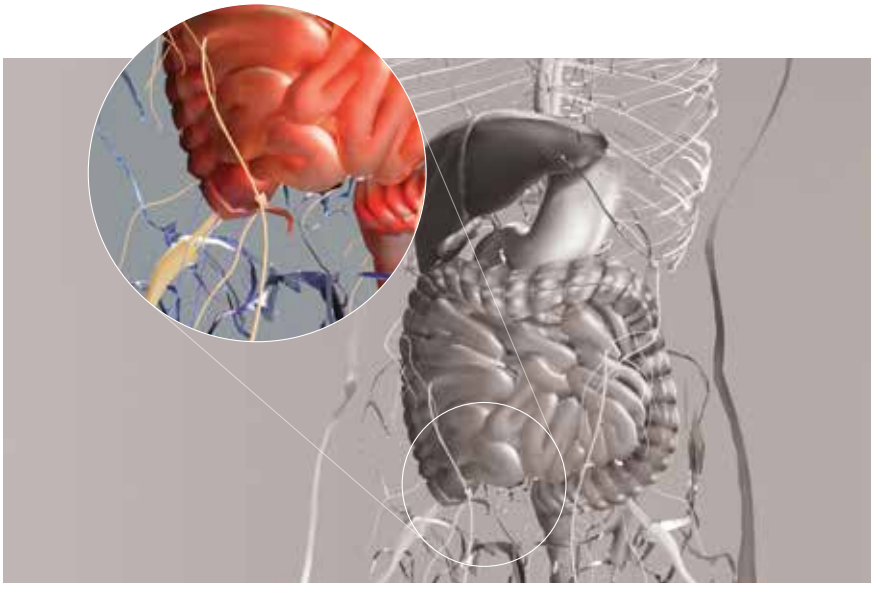
Cover Story



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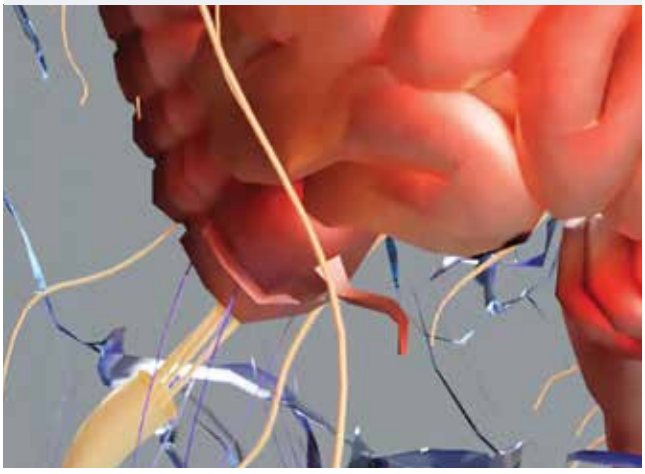

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ACS's Advocacy Achievements

Patricia L. Turner, MD, MBA, FACS
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EVERY APRIL, the ACS gathers hundreds of surgeons in Washington, DC, for our Leadership & Advocacy Summit. This conference helps surgeons learn how to advocate for legislative and regulatory changes on federal and state levels. Following the summit, groups of surgeons of all specialties attend in-person meetings with Members of Congress and their staff on Capitol Hill to speak about issues critical to our practices and our patients.

Through their engagement, we continue the work begun 50 years ago. In 1974, the ACS established the Department of Surgical Practice in response to legal changes to Medicaid, Medicare, and private insurance that affected surgeons. With a Chicago-based team and a "listening post" in Washington, DC, this department strove to give voice to surgeons' perspectives on healthcare payment and practice regulations, often via outreach to elected officials and Congressional testimony.

We have pursued advocacy aggressively ever since. The Department of Surgical Practice evolved into the Socioeconomic Affairs Department in 1985, with a strong focus on representing surgeons' interests on Medicaid and Medicare payment changes. At the turn of the millennium, the ACS organized the current Division of Advocacy and Health Policy, which spearheads a portfolio of legislative and regulatory advocacy efforts. Recognizing a political action committee would enhance our effectiveness on Capitol Hill, the ACS established a free-standing organization, the ACS Professional Association (ACSPA), in 2002. It engages in legislative and regulatory changes today as ACSPA-SurgeonsPAC.

All advocates now face an unusual environment; Congress passed fewer than 30 laws in 2023, a relatively low number. Nonetheless, our advocacy efforts have borne fruit consistently, including in the past year. Here are results of some of our recent actions.

2018

In February 2018, Congress passed MISSION ZERO legislation, which enables collaborations between military and civilian trauma surgeons to ensure troop readiness and advance trauma care quality. The legislation stemmed from a June 2016 National Academy of Medicine report on national trauma care system development that the ACS co-sponsored.

2019

In May 2019, the ACS led a Congressional briefing called "How to Protect Patients

from Surprise Medical Bills: The Physicians' Perspective." It was part of our multiyear effort to improve the No Surprises Act, which regulates billing for out-of-network medical expenses. That Act was eventually signed into law as part of the Consolidated Appropriations Act, 2021; it took effect January 1, 2022.

In August 2019, the President signed the Emergency Medical Services for Children Reauthorization bill into law. For the ACS, it was the culmination of years of advocating for reauthorization of Emergency Medical Services for Children, the only federal program dedicated to improving pediatric emergency care. The program has led to landmark improvements in care quality nationwide. The ACS is currently supporting reauthorization of this critical law (H.R. 6960 and S. 3765).

2020

In March 2020, our advocates celebrated their successful contribution to the passage of the Removing Barriers to Colorectal Cancer Screening Act as part of the Omnibus Appropriations and Emergency Coronavirus Relief Act. This law prevents billing for polyp removal during colonoscopies covered by insurance as preventive care.

The ACS has advocated for many years against Medicare payment reductions, and in December 2020, this resulted in the Consolidated Appropriations Act, 2021 including a 3.75% Medicare payment adjustment to offset conversion factor reductions for 2021.

In the same Act, our advocacy efforts helped ensure inclusion of funding for 1,000 more graduate medical education residency seats. This increase will help ease physician shortages affecting surgery and other specialties.

2021

In January 2021, the ACS saw success in its work pressing for the repeal of the McCarran-Ferguson antitrust exemption for health insurance companies, via the passage of the Competitive Health Insurance Reform Act. The repeal prevents harmful anticompetitive conduct in health insurance markets.

Also, 2021 was the first of 3 consecutive years of ACS advocacy helping to deliver federal firearm research funding to the US Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH).

2022

FY2022 was the first year that appropriations were made to fund MISSION ZERO. (Appropriations were also made in FY2023 and are pending for FY2024.)

2023

In 2023, the ACS helped advocate successfully for Congress to increase funding in FY2023 over FY2022 for the NIH (5.6%), National Cancer Institute (5.9%), and CDC (increases to every cancer program).

In addition, the ACS helped ensure extended funding for the Children's Health Insurance Program (CHIP), as well as continuous eligibility for children under Medicaid and CHIP. The FY2023 omnibus extended CHIP funding through 2029 and provides 1 year of continuous eligibility for children under Medicaid and CHIP, effective January 1, 2024.

2024

Our work continued. In 2022, the Dr. Lorna Breen Health Care Provider Protection Act became law, improving mental health care access for clinicians. As part of our work on surgeons' well-being, the ACS is currently supporting legislation (H.R. 7153/S. 3679) to reauthorize this law.

In addition, Congress passed government funding that included language mitigating cuts in Medicare physician payment. This occured in part because more than 700 ACS members contacted their elected officials to press for this change. We will continue to vigorously advance novel and creative proposals that address overall Medicare payment reform.

Engage with ACS Advocacy

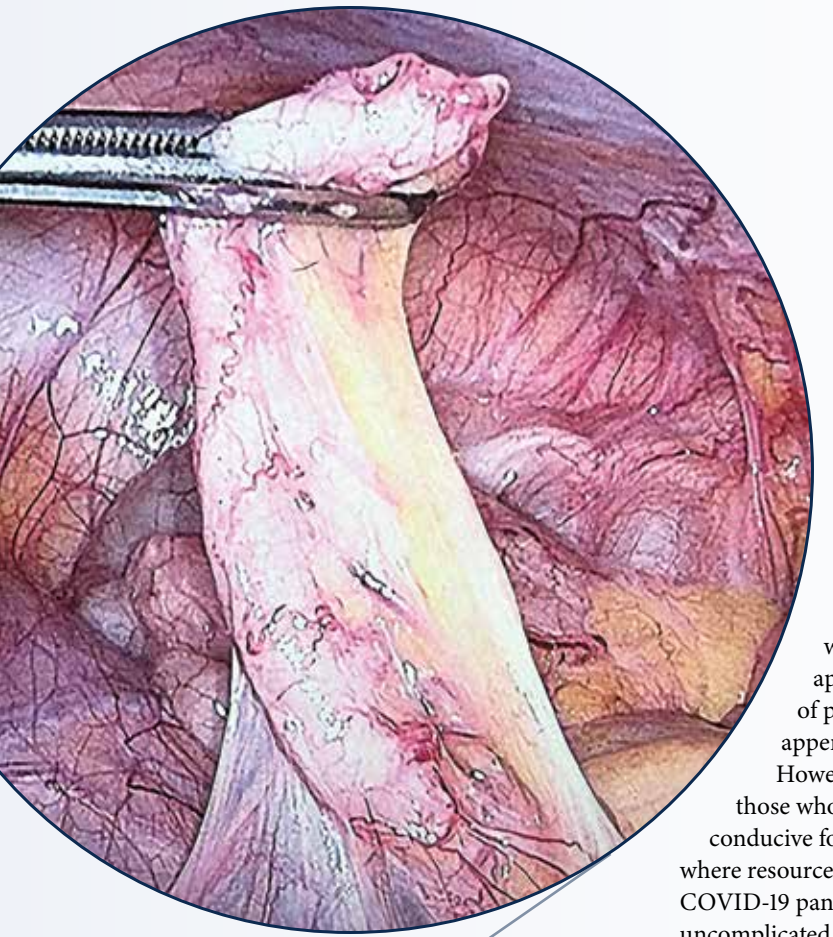
Please join us in this work. I invite all US-based surgeons to engage with us about laws and regulations important to our careers and patient outcomes. Please visit SurgeonsVoice, our advocacy center, to learn more and take action: *facs.org/surgeonsvoice.*

Dr. Patricia Turner *is the Executive Director & CEO of the American College of Surgeons. Contact her at* executivedirector@facs.org.

Are Antibiotics the Answer to Treating Appendicitis?

Tony Peregrin

Managing uncomplicated acute appendicitis can involve two treatment pathways—surgery or antibiotics—and is a clinical decision that has been rigorously debated in recent years, driven by data from several prominent clinical trials.



SURGICAL APPENDECTOMY has been the first-line option for treating uncomplicated appendicitis for more than 120 years,[1] although nonoperative management may be a safe alternative for a select patient population. Notably, in the US, only 6% of patients are treated with antibiotics for uncomplicated appendicitis, while the vast majority of patients are managed by laparoscopic appendectomy.[2]

However, for some patients, particularly those who are not in a physical state that is conducive for surgery or are located in settings where resources are limited, such as during the COVID-19 pandemic, nonoperative management for uncomplicated appendicitis is a viable alternative.[3]

Before engaging in any patient-centered decision-making regarding treatment options, it is important to identify if the appendicitis is uncomplicated or complicated, as each disease presents varying degrees of severity.[2] Radiologic assessments, primarily a computed tomography (CT) scan, can quite reliably rule out complicated acute appendicitis and confirm that the patient's appendix doesn't have an appendicolith, abscess, or perforation and is, therefore, most likely the uncomplicated form of the disease.

"I was taught to operate on every single patient who was suspected of having acute appendicitis. At that time, we did not use imaging," said Paulina Salminen, MD, PhD, FACS(Hon), professor of surgery at the University of Turku and Turku University Hospital in Finland. "So, we ended up having 30% to 40% negative appendectomies, especially in young female patients."

Opposite: Dr. Paulina Salminen performs a laparoscopic appendectomy.

While the APPAC and CODA trials demonstrated that it is likely safe to treat the first episode of uncomplicated appendicitis with antibiotics, clinicians are advised to have honest and straightforward conversations with patients about potential recurrence rates.

Access related video content online.

Dr. Salminen also is the lead investigator of the Appendicitis Acuta (APPAC) randomized trials, which focus on the treatment of uncomplicated acute appendicitis.

"The main point I want everybody to internalize is the fact that we are talking about two very different diseases," explained Dr. Salminen. "After you decide that the patient has acute appendicitis, you have to figure out whether it's the milder form, which is approximately 60% to 70% of cases, or if it is the more difficult form." She said a primary goal of the inclusion criteria for the APPAC trials (and also clinically) was to rule out patients with complicated acute appendicitis.

Evidence for Antibiotics

The three APPAC trials function as a continuation of research stemming from the initial trial that compared nonoperative management with appendectomy in adults with CT-verified uncomplicated acute appendicitis.

The 5-year follow-up of the first trial (November 2009 to June 2012 in Finland) was completed in September 2017. Among the 530 patients who were selected for the randomized clinical trial, 257 individuals were in the antibiotics group. At the 1-year mark, 70 patients in the antibiotics group received an appendectomy, with 30 additional patients requiring the procedure between 1 and 5 years.[4] The cumulative recurrence rate evaluated by appendectomy mandated by the study protocol for suspected recurrence was 34% at 2 years, 35.2% at 3 years, 37.1% at 4 years, and 39.1% at 5 years.[2]

"Surgery is always a big deal, and everything we do carries risk," said Drew Gunnells Jr., MD, FACS, assistant professor in the Division of Gastrointestinal Surgery at The University of Alabama at Birmingham. "Although an appendectomy is one of the more straightforward procedures we do, there's still risk associated with it. And, so, can we avoid surgical intervention for a disease that for a long time has been treated with surgery?"

According to Dr. Gunnells, as long as the chance for the patient with uncomplicated appendicitis requiring an operation in the future is minimal, treatment with antibiotics may be a safe option. "I think, based on the Comparison of Outcomes of Antibiotic Drugs and Appendectomy (CODA) trials and the APPAC trials, you're not putting the patients at risk of undue harm by treating them with antibiotics. The question in my mind is: What's the recurrence rate of appendicitis, and are those patients going to need surgery in the future?"

CODA, a large, randomized clinical trial of antibiotics for appendicitis, was conducted at 25 US medical centers. From May 2016 to February 2020, 1,552 adults with appendicitis were randomly assigned to receive either antibiotics or appendectomies. According to findings presented at ACS Clinical Congress 2020 and published simultaneously in *The New England Journal of Medicine*, approximately half of the patients in the trial did not require an appendectomy up to 4 years after receiving antibiotics.[5]

Despite these findings, clinicians are encouraged to review the data with a critical eye. "We need to have an evidence-based approach to treating uncomplicated appendicitis and not an eminence-based approach," suggested Dr. Salminen, underscoring the importance of carefully assessing new and existing research in this area.

Risk of Recurrence

Benjamin H. Stone, MD, MBA, FACS, a general surgeon at The University of Kansas in Kansas City, also suggested focusing on the success and failure rates for both treatment options.

"We've had 100+ years of operative therapy for acute appendicitis—so we have a good track record to benchmark other management modalities,"

Dr. Stone said. "Surgical therapy is at least 96% effective for this disease. We need to be candid and open about the fact that these results are not the same for nonoperative management. Most of the best studies, when we look at long-term data, have about a 25% failure rate compared to maybe a 1% to 4% failure rate for operative therapy."

For example, the long-term data for the CODA trial revealed that 40% of patients who were prescribed antibiotics underwent subsequent appendectomy at 1 year and 46% received the procedure at 2 years, rising to 49% at 3 and 4 years.[5]

"If you look at the patients with an appendicolith on their initial presentation in the CODA trial who ended up getting an appendectomy, it was about 50% in 2 years," added Dr. Gunnells. "That number is fairly high in my mind, and those patients probably just need to have their appendices out to decrease their risk of recurrence in the future."

While the APPAC and CODA trials demonstrated that it is likely safe to treat the first episode of uncomplicated appendicitis with antibiotics, clinicians are advised to have honest and straightforward conversations with patients about potential recurrence rates.

"The more data we accrue long-term, we find that the recurrence rates continue to go up," added Dr. Stone. "Those early benchmarks for near equivalence or noninferiority don't seem to hold up over time. I also think it's important to keep in mind that patients don't read these studies in depth, if at all, and there are exclusion criteria that need to be considered."

Exclusion criteria for nonoperative management could include comorbid conditions and other concomitant acute presentations, chronic conditions such as Crohn's disease, patients taking immunosuppressants or undergoing chemotherapy,

Nonoperative management of uncomplicated acute appendicitis typically begins with intravenous antibiotics.

> "Something that is not always discussed when we're comparing these studies are the resources that are required as far as money, personnel, and time, especially considering all the follow-up that is required for nonoperative management. Not everyone practices under those circumstances."
>
> Dr. Benjamin Stone

as well as patients who are pregnant.

"We're not trying to omit appendectomy," explained Dr. Salminen. "We're just trying to select the patients who would be best off with surgery and others who actually could do without surgery. The majority of recurrences happened during the first year and a half—and that's quick. If you want to do nonoperative treatment with antibiotics, you need to inform the patients that if they have a recurrence or experience similar symptoms, they need to inform their next surgeon that they've already had one round of antibiotics to successfully treat the disease."

Paradigm Shifts: Past and Future

Over the last century, a couple of key paradigm shifts regarding the management of appendicitis have happened. After Reginald Herber Fitz published a study on appendicitis in 1886, where he officially named the procedure, Charles McBurney proposed an innovative muscle-splitting operation in 1893.[6]

At that time, it was thought that all patients with appendicitis required an appendectomy. "We know that is not true. That realization was the first paradigm shift," Dr. Salminen said, referring to nonoperative treatment.

The second major paradigm that could occur in the future—exploring whether antibiotics can be omitted for uncomplicated acute appendicitis—would result from the findings of the APPAC IV trial, which is currently underway.

"What we're trying to prove now with APPAC IV is whether or not we even need antibiotics," said Dr. Salminen, noting that an optimized nonoperative treatment does not currently exist. Typically, nonoperative management begins with intravenous antibiotics followed by as many as 7 days or more of oral antibiotics.[7]

"If symptomatic treatment is sufficient with results similar to antibiotics—this really will change the field because then we have a disease that for some patients actually resolves by itself without any specific treatment. So, if you don't even need antibiotics, you really cannot justify operating on all the patients. That's not good, evidenced-based medicine," she said.

Another key component of the APPAC IV trial that could drive a major paradigm shift is the fact that researchers, led by Dr. Salminen, are conducting intravenous antibiotic therapy in the outpatient setting. The majority of patients in the trial will be discharged directly from the ER, which will help determine whether hospitalization can be avoided, saving resources and cutting costs.

Comparing Costs

Studies comparing the costs associated with nonoperative versus operative treatment are somewhat limited at this point. However, one study demonstrated higher medical costs for surgical treatment of uncomplicated appendicitis with a difference of $1,067 per patient.[2,8]

Costs also were discovered to be higher for patients treated operatively in the APPAC trial, at both the 1- and 5-year follow-ups, where the costs were reportedly 1.6 and 1.4 times higher, respectively.[2] These costs included factors related to hospital length of stay and sick time as it correlated to productivity loss.

"This difference in costs to both the service providers and society overall strongly encourages further evaluation of antibiotic therapy as the first-line treatment for uncomplicated acute appendicitis," noted Dr. Salminen and coauthors in a 2017 article published in the *British Journal of Surgery* that provided an economic evaluation of both treatment modalities in the APPAC trial.[9]

Other clinicians assert that the appendectomy, considered the gold standard treatment, is the least expensive option because of its success rate.

"The reason that it's the cheapest is because often

it's very effective," said Dr. Stone. "I think it's the single most effective way of dealing with acute appendicitis as the lowest failure rate. We don't yet have the long-term follow-up that we need with nonoperative therapy to make certain these people aren't recurring, and we know they are, with up to 30% and 40% relapse rates."

Dr. Stone, who currently practices in a community hospital setting, also highlighted the relevance of some other cost factors that are not routinely discussed in these economic evaluations.

"Something that is not always discussed when we're comparing these studies are the resources that are required as far as money, personnel, and time, especially considering all the follow-up that is required for nonoperative management. Not everyone practices under those circumstances," he said, emphasizing the need for more detailed cost analysis of both treatment modalities.

While managing uncomplicated appendicitis with antibiotics is a safe, cost-effective alternative with potentially fewer complications than surgical treatment, appendectomies have a higher efficacy rate. Clinicians are encouraged to stay current on new research findings and have frank and open discussions with patients regarding the realities of each treatment option. B

Tony Peregrin *is the Managing Editor of Special Projects in the ACS Division of Integrated Communications in Chicago, IL.*

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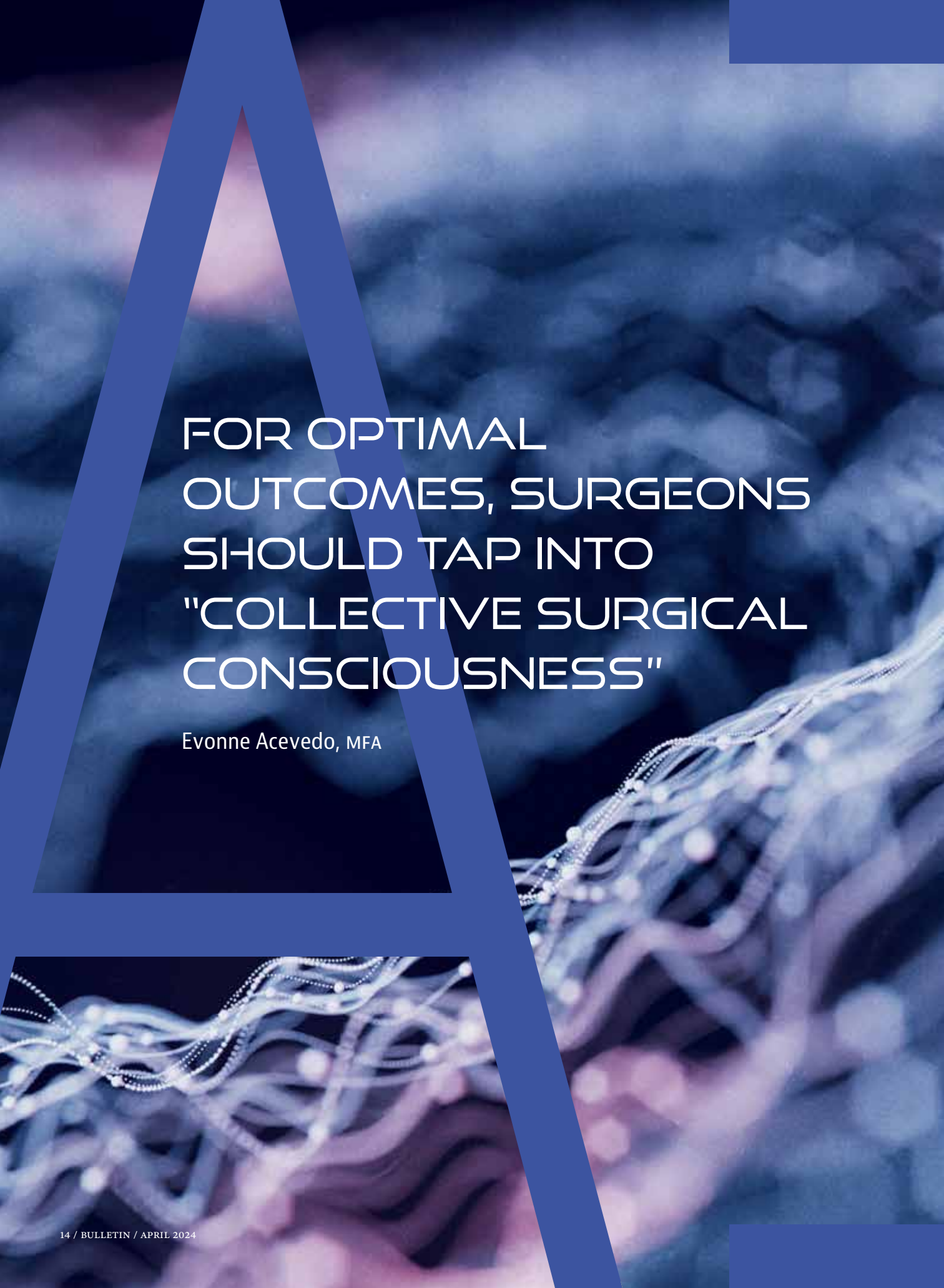

FOR OPTIMAL OUTCOMES, SURGEONS SHOULD TAP INTO "COLLECTIVE SURGICAL CONSCIOUSNESS"

Evonne Acevedo, MFA

In an arena where the smallest bit of data can change the course of an operation—and ultimately have a huge impact on patient outcomes—surgeons are taking a cue from medical imaging's advancements in artificial intelligence (AI) to glean all the information they can get.

KERI A. SEYMOUR, DO, MHS, FACS, FASMBS, a general and bariatric surgeon at Duke University Medical Center in Durham, North Carolina, saw an opportunity to optimize her patients' success when she teamed up with a Duke radiologist who's studying body composition and analysis from abdominal computed tomography (CT) scans.

Dr. Seymour, an associate professor of surgery at Duke University and director of research in the Division of Minimally Invasive Surgery, has conducted multiple studies on how metabolic factors affect patient outcomes, examining variables that influence the success of an operation and the patient's postoperative progress.

"Treatments for obesity tend to focus on body mass index (BMI) as a way to standardize our evaluation of patients," said Dr. Seymour, who also is President of the North Carolina Chapter of the ACS. "But that doesn't really describe their body composition, and distribution of adipose tissue and muscle as well. Patients can have a significant amount of muscle and still have increased weight and a higher BMI."

Bioelectrical impedance testing provides more comprehensive information, especially for measuring changes in body composition over time. "There is an interplay in patients' metabolism and their pre- and post-op states," she explained. "Visualizing that relationship is key to understanding their progress. What I've come to appreciate is that we can use medical imaging to evaluate their fat mass—to see if patients are losing not just fat but also muscle."

Enter Kirti Magudia, MD, PhD, an assistant professor of radiology at Duke University investigating high-level applications of machine learning in radiology.

Drs. Magudia and Seymour are currently working on a study of how CT-based body composition analysis could help optimize the selection and management of bariatric surgery patients. Preliminary results suggest that bariatric surgery patients with low or very low food security have less skeletal muscle and higher subcutaneous fat compared with those who have food security. "Despite these differences, bariatric surgery

outcomes were similar across both groups, suggesting its effectiveness in improving the health of patients with obesity, including those facing food insecurity," they observed.

The two physicians soon learned that their individual collections of data, including routine CT scans, could be combined and mined for important insights on an individual patient, even beyond Dr. Magudia's passion for CT-based body composition. "For example, hepatic arterial anatomy can have many vascular variants," Dr. Magudia said. "I keep drilling into our radiology trainees that they need to report it. You never know when it's going to be needed, even for routine surgeries, like cholecystectomy."

AI tools could also aid in the identification of patients in the emergency department who need the most urgent imaging and surgical intervention, Dr. Magudia said. She further noted that she and Dr. Seymour had both been on call during the prior weekend shift. "Our goal was to find those CT scans that Dr. Seymour needs to know about, so that they could be acted upon—and were not buried under all the other radiology exams for patients with less urgent issues. That way, they could get to the OR as quickly as possible."

That also means making sure patients get the right kind of imaging, giving the surgeon the most useful information. Deep learning models can help prefill recommendations for appropriate imaging tests, giving providers both a heads-up and a head start.

An Israeli study presented at the 2023 annual meeting of the Radiological Society of North America (RSNA), for example, found that ChatGPT can deliver recommendations[1] for appropriate imaging tests that might be as reliable as the recommendations of the European Society of Radiology (ESR) iGuide. In their presentation, Mor Saban, PhD, and Shani Rosen, MSc, demonstrated that when ChatGPT is presented with clinical data about patient symptoms, it can generate suggestions to help clinicians select the imaging modality—X-ray, CT, ultrasound, magnetic resonance imaging, and beyond—that an experienced radiologist might recommend.

In that study, human experts evaluated the ChatGPT suggestions and found that up to 87% of them were medically accurate, when compared with those compiled in the ESR iGuide. And, as the authors noted, ChatGPT isn't even specifically designed for medical tasks.

Fear Not—It's Just an Algorithm

To the uninitiated, statements like "AI can recommend medical imaging tests" might seem like the unsettling prelude to a scenario where physicians could be replaced by machines that lack the nuance of human insight. But understanding how tools like ChatGPT are trained—on the collective knowledge of humans—can shine light on the possibilities for maximizing human potential.

For example, ChatGPT is fed chunks of text—called tokens—that come from websites, books, articles, and other publicly available sources. By building a dataset from these tokens, the model learns to predict the words or phrases human experts would be likely to use given a particular context.[1]

In a clinical setting, having auto-filled suggestions could take some of the legwork out of initial evaluation—and even encourage more thorough documentation. In a scenario such as Dr. Magudia's example, in which being aware of unusual hepatic arterial anatomy could be vital to perioperative planning, an AI tool could help ensure that information is documented, whether the radiologist in the previous clinical case thought it relevant to note or not.

Elizabeth Burnside, MD, MPH, a professor in the Department of Radiology at the University of Wisconsin-Madison, explained during an RSNA 2023 plenary session the differences between

"We work on predicting what is happening in the next couple of seconds, or the next phase of an operation, in order to anticipate surgical risk."

Dr. Jennifer Eckhoff

discriminative AI models and generative AI models, offering digestible analogies for what each can accomplish. While discriminative models are primarily used to classify existing data into predetermined outcomes of interest, generative models use algorithms to craft content, incorporating text and images based on the data that trained them.

As an example, a discriminative model could be trained on millions of images of cats and dogs to learn their differences and, when presented with a new image, accurately label it as a cat or dog, Dr. Burnside said. Generative models train on similar data, but in this context, they would then be tasked with generating an image of a new cat or dog.

In a radiology setting, discriminative AI tasks could include identifying cancer on a mammogram or finding a bleed on a neuroimaging study—or determining whether pneumonia seen on a chest X-ray is related to COVID-19 infection. A generative model might be employed to create a radiology report based on the images it receives, simulate disease progression in a body system, or create summaries for patients in lay language.

The accuracy and the generalizability of an algorithm is dependent not only on the amount of information it's given, but also on the composition and diversity—including patient and surgeon characteristics—of the training data, said Jennifer A. Eckhoff, MD, from Massachusetts General Hospital in Boston.

Dr. Eckhoff, a senior resident at University Hospital Cologne in Germany, interrupted her residency in 2021 to start a postdoctoral fellowship at Mass General's Surgical Artificial Intelligence and Innovation Laboratory (SAIIL). She's now harnessing AI's predictive qualities to assess risk from interoperative events.

"My research focus is on computer vision-based analysis of surgical video data—specifically intra-abdominal minimally invasive surgical data," Dr. Eckhoff explained. "We work on predicting what is happening in the next couple of seconds, or the next phase of an operation, in order to anticipate surgical risk."

Using video analysis, Dr. Eckhoff's team examines the spatial and temporal relationships of the actions and tools that compose surgical workflow, using them to predict a surgeon's next move. They train AI models to identify procedural steps on a granular level, down to tissue-to-tool interaction.

The next step is to integrate quantitative data from these video analyses alongside perioperative data to help predict patient-specific complications, readmissions, and oncological outcomes. One of SAIIL's current projects, coincidentally, focuses on patients undergoing laparoscopic cholecystectomy.

Most AI applications in surgery are currently based on supervised machine learning models, which involve training an algorithm on labeled data, Dr. Eckhoff explained. "So an algorithm is provided with a certain video dataset, which might be labeled with respect to the critical view of safety and its three subcomponents," she said, referring to visual criteria in a laparoscopic image—also known as Strasberg's criteria—that let a surgeon know it's safe to proceed with removing the gallbladder.

A challenge for AI-augmented surgery is building models that adequately integrate human knowledge and understanding. Dr. Eckhoff and her colleagues have proposed a novel approach to training the networks: incorporating a knowledge graph into the video analysis, to identify an algorithm's "understanding" of surgical notions and its ability to acquire conceptual knowledge as it applies to the data.

Their research demonstrated that AI models are able to learn tasks such as verification of the critical view of safety, apply the Parkland grading scale, and recognize instrument-action-tissue triplets.[2]

> "We're going to be building our shared knowledge to create what we call a shared surgical consciousness, one that holds more knowledge than any single surgeon can acquire."
>
> Dr. Ozanan Meireles

Meanwhile, Back at Duke

The principal investigator on the SAIIL project, Ozanan R. Meireles, MD, FACS, has assumed a new role as the Duke University Department of Surgery's inaugural vice-chair for innovation. Dr. Meireles joined Duke in January, bringing with him the collaborative efforts of SAIIL and the Massachusetts Institute of Technology Computer Science and Artificial Intelligence Lab.

"By using the interaction between the surgeon and the machine to improve operational efficiency, the machines will get better over time," Dr. Meireles said. "We're going to be building our shared knowledge to create what we call a shared surgical consciousness, one that holds more knowledge than any single surgeon can acquire. That collective surgical consciousness can guide us away from complications and truly improve patient care."

Drs. Meireles and Eckhoff both expressed their excitement about the Critical View of Safety (CVS) Challenge, endorsed by the Society of American Gastrointestinal and Endoscopic Surgeons. It's a global initiative to generate a large, diverse, annotated dataset for assessing the CVS, and it encourages researchers to compete in developing AI algorithms for real-time CVS detection, enhancing surgical safety and potentially easing surgeons' workloads.

"In our work, we very much focus on governance of surgical video data and AI as it is applied to surgery," Dr. Eckhoff added. "We're composing a framework for interdisciplinary and international collaboration, which is essential for assembling large datasets, with respect to internationally varying privacy and data management regulations."

As Dr. Meireles explained, the CVS Challenge platform is designed to automatically de-identify all videos that contributors submit. "When you upload a video, you do it through a secure account, and there's a data-sharing agreement explaining that the video will be de-identified. The platform strips all the metadata, and, if the camera comes out of the abdomen and there are images taken outside the body, it blurs them."

He adds that, while privacy regulations vary in different parts of the world and there are special considerations for certain rare cases, this process for anonymizing data has been well received by participants across the globe who recognize that the ability to share surgical knowledge is essential for actionable research.

More Like GPS than a Self-Driving Car

An analogy that's often used in comparing AI versus human decision-making is that it's akin to a self-driving car versus a human driver—the former hasn't quite mastered complicated driving that benefits from the nuances of human experience. Dr. Meireles likens AI-assisted surgery to a human driver using GPS. He noted that drivers are more likely to follow a suggestion from a GPS—which mines collective data to predict the most efficient route—than they are from a human passenger.

Still, "if you're using a navigation tool and it tells you to turn right or left, you could ignore it and just keep driving," he said.

Which raises questions about accountability and communication: "As we're going through this cultural transformation era through artificial intelligence, patients should understand that AI agents might be helping their physician make a decision—or even that their physician could be disagreeing with the AI. How are we going to be explaining that, and what's the patient's role in this?" Dr. Meireles asked.

Best Outcomes Take a Village

If incorporating these steps into surgical workflow seems daunting, Dr. Magudia has a reminder for clinicians. "Around 30 years ago, most radiology exams were on physical film, and it took a lot of work and effort among vendors and clinical radiologists

to get to where we are today with PACS (picture archiving and communication systems) and the DICOM (digital imaging and communications in medicine) standard imaging format. This has revolutionized the way radiology is practiced and allowed us to advance further."

Dr. Seymour has begun conversations with other clinicians in her role as chief quality officer about using accessible data to reveal additional factors that contribute to a surgery's success. "We've talked about surgical site infection management, looking at the information we already have in the operating room—anesthesia, patient temperature, the timing of antibiotics—all the things we can record and review to see if they'll be predictive of patient outcomes."

And incorporating those factors into an automated system can help surgeons better anticipate the course of their workflow. One of Dr. Meireles's recent projects—again in laparoscopic cholecystectomies—involved an AI model that was trained to grade intraoperative difficulty via the Parkland grading scale from an initial view of the gallbladder.

The AI's performance was comparable to that of a human surgeon in identifying the degree of gallbladder inflammation, which is predictive of intraoperative course.[3] By quickly predicting how difficult a cholecystectomy will be—and how long it will take a surgeon to complete—this automated assessment could be useful for optimizing workflow in the operating room, the researchers stated.

The model also could help develop personalized feedback for surgeons and trainees, offering opportunities for them to perfect their technique.

Harnessing the potential of AI will naturally come with regulatory and data management responsibilities, Dr. Eckhoff noted. "That also entails involving different stakeholders, including patients, other operating room staff, computer scientists, industry representatives, and other medical specialties."

Medical specialties like radiology and pathology have embraced AI at a particularly impressive pace, explained Dr. Eckhoff. Indeed, the RSNA annual meeting in November boasted nearly 400 sessions covering AI topics alone, and not just for clinical decision support. Presenters explored applications from opportunistic screening to patient-centered practice to creating a more egalitarian process for leadership selection.

"The impact that clinical societies have is unmatched, especially in the United States," she said. "And we have a great opportunity to shape the perception of AI among clinicians in the future, demonstrating that we can use it as a tool, and how the umbrella term 'AI' can be divided into many different subsections and subdisciplines."

Dr. Eckhoff said she is excited to see how AI will impact outcomes. "Each tool needs to be tested for clinical validity, but we're not far from seeing how AI can really change the concept of surgical safety."

Evonne Acevedo *is a freelance writer.*

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New Technologies, Approaches Help Surgeons Maximize Use of Transplant Organs

Jim McCartney

New techniques and technology to recover, preserve, and rehabilitate donor organs are optimizing the use of transplant organs and helping close the chronic gap between the supply and demand for transplant organs.

Overleaf: Dr. Zoe Stewart works with the surgical oncology team to successfully complete a portal vein reconstruction at the UH Cleveland Medical Center in Ohio.

WHILE THERE HAS BEEN a recent increase in the number of donors, this uptick has been unable to match the growing need for transplant organs.

In the US alone, although a record 46,632 transplants were performed in 2023 (up 8.7% from the previous year),[1] 103,000 people are still waiting for organ transplants; 17 of them die each day (see Figure, page 23).[2]

"The greatest gap is in kidneys," said Zoe Stewart Lewis, MD, PhD, MPH, FACS, chief of the Division of Transplant and Hepatobiliary Surgery at the University Hospitals (UH) Cleveland Medical Center in Ohio and director of the UH Transplant Institute, adding that the main causes of kidney failure are hypertension, obesity, and diabetes—all of which are rampant in the US.

In 2022, 808,000 Americans were living with end-stage kidney disease, and nearly 90,000 people are on the waiting list for kidneys—more than three times the record 25,000 transplants performed in 2022.[3]

In addition, organs were historically matched with recipients in a small local area, and despite a federal regulation stating that geography should not determine an individual's chance of being a transplant candidate, a significant geographical variation remains across transplant centers in the US. This resulted in geographic inequity in terms of access to a transplant.[4]

"There has now been a push to create an allocation system with broader sharing of potential donors so that patients who live in areas where donation rates are lower still have equal access to transplants," Dr. Stewart said.

Likewise, there are ethnic disparities, in part because diseases are more prevalent in some ethnic populations. One of four pillars of the Association of Organ Procurement Organizations' campaign, "50K Organ Transplants in 2026," is to reduce health inequities to improve accessibility to organ transplants in minority communities.[5]

"What we used to call fatty liver disease tends to be more present in areas where there is a high Hispanic population," said Amit K. Mathur, MD, MS, FACS, a transplant and hepato-pancreato-biliary surgeon and surgical director of liver transplantation at the Mayo Clinic in Phoenix, Arizona. "Not enough donors in a particular area can exacerbate the mortality risk there."

Organ Supply and Demand Are Out of Balance

Like any supply-and-demand scenario, the solution to the transplant organ imbalance is to increase the supply of organs or decrease demand for them.

Aside from efforts to increase organ donation by better educating potential donors and their families, Dr. Stewart said that more could be done to encourage living donors who may donate one of their two kidneys or part of their liver, as receiving organs from living donors often results in the smoothest recoveries and best long-term outcomes.

Of the 46,000 transplants performed in 2023, approximately

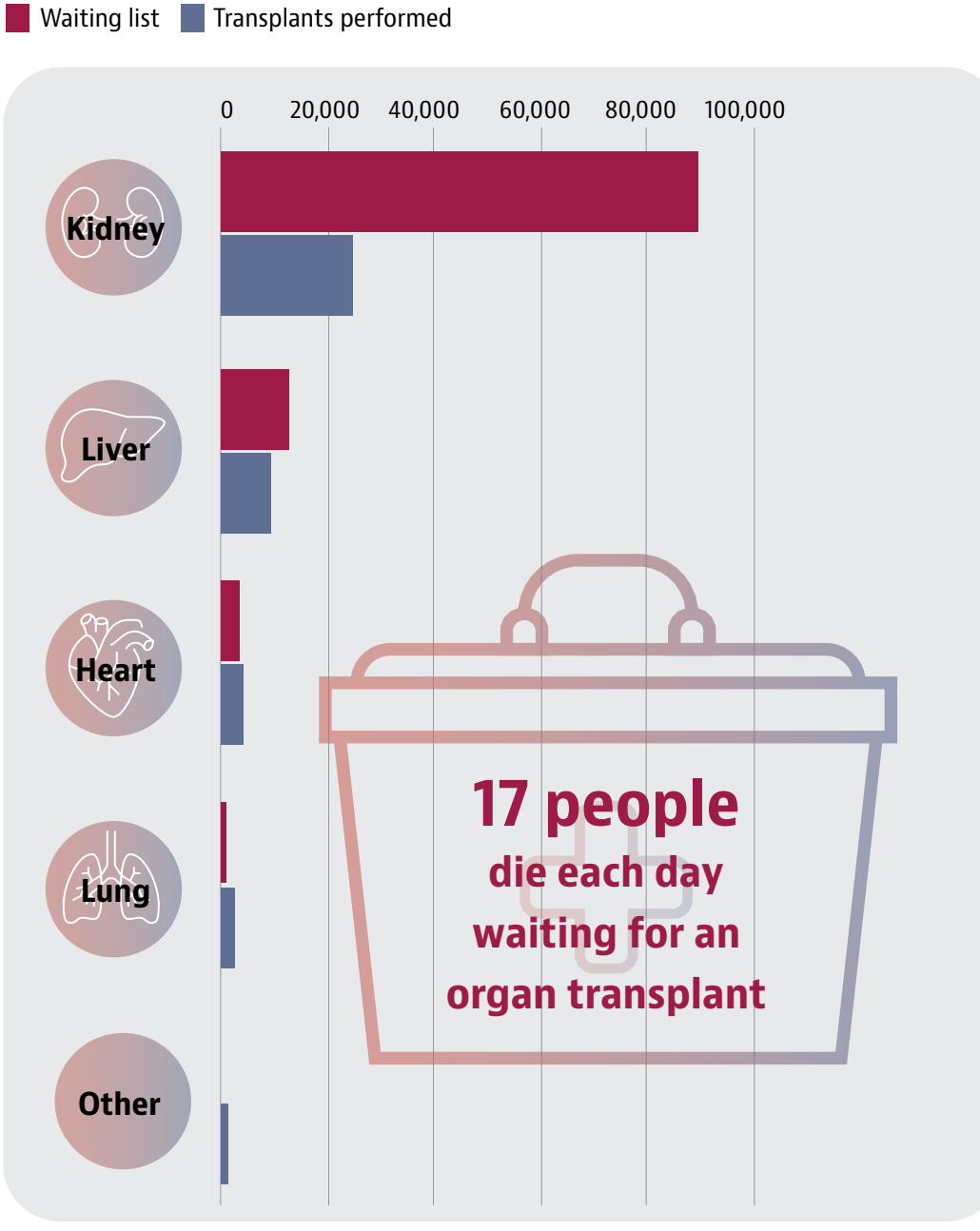
39,000 were from deceased donors, and 7,000 were from living donors.[6] According to Dr. Stewart, efforts to increase living donors include educating the public about the safety of the procedure and reducing barriers to undergoing the procedure. For example, although living donors are often reimbursed for their travel costs, they are not fully reimbursed for other costs, such as time away from work and childcare.

Another cause of the supply and demand imbalance is the rising demand for organ transplants. End-stage kidney disease has become so prevalent in the US population due to rapid increases in hypertension, obesity, and diabetes, Dr. Stewart said. These conditions could be reduced through disease prevention strategies, including better diet and lifestyle practices and improved access to healthcare.

"If we could take a fraction of the resources and energy we spend supporting patients on dialysis or through transplants and invest it in prevention and primary care, we could reduce a lot of kidney disease in this country," she said.

Figure. The Organ Shortage Crisis in the US

Number of patients on the waiting list vs. patients who have received transplants in 2021, by organ



Available Organs Go Unused

Aside from too little supply and too great a demand, the process can be inefficient. Available organs are not always being used effectively or at all.

In 2022, 19.14% of all organs successfully recovered from donors were not transplanted into a recipient.[7] Organs recovered by organ procurement organizations and not used for transplant has doubled in the last 5 years.[8]

The organ distribution system does not always get donor organs to the right recipients in a timely, efficient, and fair manner. Aside from the traditional challenges of transporting and preserving the organ, the duration of the process of offering transplant organs can sometimes exceed the time the organ is viable. Last year, as part of a broader modernization effort intended to shorten wait times, address inequities, and reduce the number of patients who die while waiting for transplant, the Biden administration proposed breaking up the United Network for Organ Sharing—the network that has long run the nation's organ transplant system.[9]

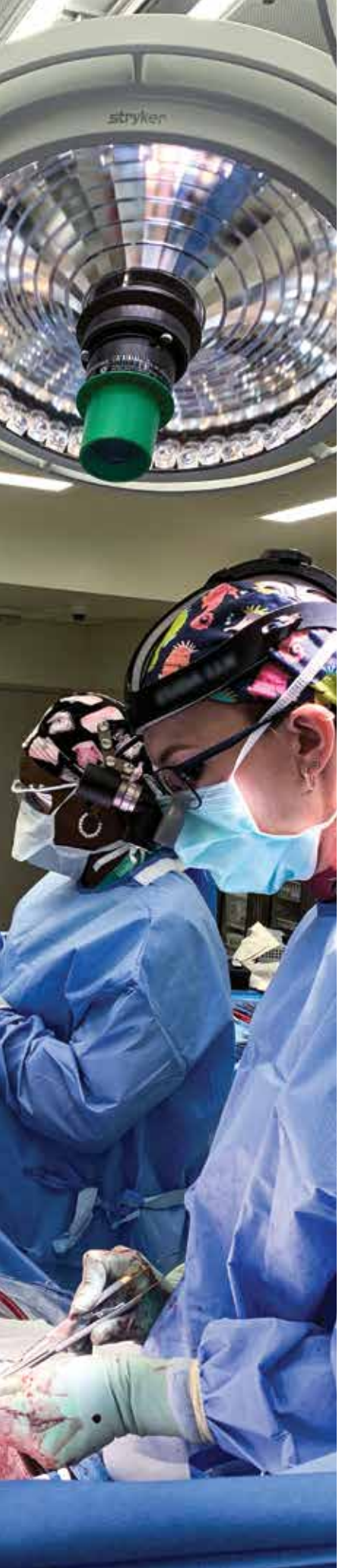
Nevertheless, improvements have been made. One is to shorten the amount of time transplant centers have to review an organ offer and respond. Another process enhancement is the ability for transplant centers to access detailed data about what types of organs they will choose. This information helps centers identify their criteria for the organs they will choose, allowing them to filter out organ offers they are unlikely to accept and quickly send that offer to the next recipient on the list.

"As an example, if a transplant center has never transplanted a kidney from anybody over the age of 65, then it can set its organ offer filters to automatically code out any donor over the age of 65," Dr. Stewart said. Other filtering criteria include donor's last creatinine value, biopsy values, and how long the kidney has been in cold storage.

Still, viable organs go unused. "Probably once or twice a week, I will hear an offer that I would have accepted and transplanted but I am unable to get the kidney here in time as it's across the country with 20 hours of cold time already," Dr. Stewart explained. She estimates that hundreds of organs a year in the US are "lost opportunities."

Another reason that viable organs go unused is that many transplant centers are reluctant to take the time to adequately assess and receive organs from older and more complex donors. Reasons include a conservative approach to choosing transplant organs, the lack of infrastructure to take care of complex patients posttransplant, and the fear of poor outcomes and associated risks with using "marginal" organs. As a result, the US is behind Europe in using medically complex organs. For example, 62% of kidneys recovered and not utilized in the US would have been transplanted in France.[10]

Dr. Stewart said she is surprised that some transplant programs won't consider a kidney that has been more than 24 hours on ice. Her transplant center will accept organs that have been cold for up to 40 hours.



At the University of Colorado in Denver, Dr. Jordan Hoffman—the surgical director of heart and lung transplantation—walks Alison Mungo, MD, a cardiac surgical fellow, through a heart transplant operation.

Refining Organ Use and Surgeons' Role in the Process

Efforts to maximize organ use include increasing the pool of potential donor organs through closer evaluation of donation after circulatory death (DCD) organs and advancements in organ preservation, as well as expanding donor criteria and applying new technologies to better recover, rehabilitate, and preserve organs.

Willingness to take on higher-risk donors and recipients

Due to the existing gap between organ supply and demand, marginal organs are increasingly being considered. But this approach requires transplant centers to be willing to take on more risk.

"Being more aggressive with donor offers and looking at marginal donors can help get people organs more quickly and reduce death on the waitlist," said Jordan Hoffman, MD, FACS, surgical director of heart and lung transplantation at the University of Colorado in Denver.

Large transplant centers tend to take more of an aggressive approach than smaller centers because they have the resources and infrastructure to provide individualized and intensive patient care before and after transplant, Dr. Stewart said. Nevertheless, transplant centers should more closely assess organs and be willing to stretch their acceptance criteria.

"Give every organ a chance," Dr. Stewart said.

Reduce risk to reward innovation

Transplant centers are more likely to take on marginal donors if the outcome metrics by which they are measured are less strict, according to Dr. Stewart, who said that transplant centers are expected to maintain outcomes of 96% or more for 1-year grafts and patient survivals. "If you deviate from those high regulatory metrics, you face regulatory implications for your program," she said.

Although the US has one of the best organ donation and transplant systems in the world, it may be too stringent when it comes to outcomes monitoring policies, said Dr. Mathur. "That can stifle practice. We need to be more responsive to innovation."

Reducing risks of regulatory discipline for transplant centers could lower the risk of patients dying on the waiting list.

"We need to take a more holistic approach to risk management," Dr. Stewart said. "People on the transplant waiting list shouldn't die because transplant centers are too choosy about what organs they accept."

DCD organ use has grown significantly

DCD organs may be compromised by hypoxic-ischemic brain injury because they cannot be removed until the donor has been declared dead, which in the US, usually happens after the donor has been pulseless for 5 minutes.[11] For years, when compared with donation after brain death (DBD) organs, DCD provided a lower yield of transplantable organs, decreased patient and graft survival rates, had higher complication rates, and increased delayed graft function.

In 2010, about 85% of transplant organs were DBD organs, while 15% were DCD, Dr. Stewart said.

Since then, advances in perfusion technology have made DCD organs a more viable option. DCD hearts have increased the donor heart pool by about 20% to 30%, and complication rates have decreased to the point that DCD organs are on par with DBD organs.

"We use a modified pump to perfuse the organs that we want to use for transplant," said Dr. Hoffman. "While we're doing this, we're also examining the function and physiology of those organs."

In addition, transplant teams are able to travel to a donor site and perfuse the organ. This normothermic regional perfusion (NRP) technique has outcomes equivalent to ex vivo perfusion, according to Dr. Hoffman, who called NRP a "game changer" for hearts, lungs, livers, and kidneys.

At Dr. Stewart's clinic, 50% of livers have been DCD organs in the past 6 months, compared to 0% in the year prior.

Unfortunately, DCD lungs have not grown in use as fast as other organs. Since lung recipients typically have a limited life span (medial survival of approximately 6 years or so), surgeons want to ensure that the donor lungs are in the best possible condition and do not lead to complications.

The main limitation to perfusion is expense, which means transplant programs need to find ways to recoup costs. Notably, NRP is more financially viable than any other procurement technique, including ex vivo perfusion, according to Dr. Hoffman.

Expanding the donor pool

The definition of viable organs has expanded over the years. In many cases, organs from older donors or donors who smoke or drink alcohol are not automatically eliminated.

Indications for using transplant to treat liver disease already are

Along with a full transplant team, Dr. Zoe Stewart performs a kidney transplantation on a patient with end-stage kidney disease.

expanding beyond chronic liver disease, as donor livers may be used to treat diverse types of cancers, Dr. Mathur added.

Newer preservation methods, including targeted perfusion solutions and advanced machine perfusion methods, also may provide opportunities to treat, maintain, and assess marginal organs and improve transplant outcomes. New therapies in perfusion fluids hold promise to lessen tissue injury, inhibit immune responses, and maintain cellular homeostasis. Machine perfusion advancements offer means of functional maintenance, restoration, and assessment while reducing damage associated with static cold storage.[12]

Artificial intelligence (AI) also has the potential to transform transplantation through improved allocation algorithms, smart donor-recipient matching, and dynamic adaptation of immunosuppression to automated analysis of transplant pathology.[13]

Mayo Clinic researchers have suggested that AI will be able to eliminate the need for a transplant by detecting organ failure earlier; increase organs usable for transplant by identifying which organs would benefit from perfusion systems; prevent organ rejection and decrease posttransplant complications; and improve posttransplant care by gauging how a patient's body reacts to immunosuppressants.[14]

The ability to transplant organs is one of the great achievements of modern medicine. Increasing the supply of organs, decreasing the need for transplants, streamlining and advancing the organ allocation process, and employing more efficient and effective use of donor organs will help create a more robust system that ultimately will help even more patients.

Jim McCartney *is a freelance writer.*

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Physician Workforce Data Suggest Epochal Change

M. Sophia Newman, MPH

IN LATE JANUARY, THE ASSOCIATION OF AMERICAN Medical Colleges (AAMC) released the 2023 US Physician Workforce Data Dashboard,[1] the organization's latest dataset on the medical workforce. The dashboard provides detailed data, current to December 31, 2022, on active physicians in all practice specialties with more than 2,500 active physicians..

As with previous AAMC reports, this data release combines US Census and AAMC information with the American Medical Association Physician Professional Data™—a historical database of the education and professional certifications of more than 1.4 million physicians. Uniquely among AAMC reports, however, the new dashboard is an interactive display that allows users to generate bar graphs and maps on physicians in specified specialties, geographic locations, and demographic groups.

The dashboard is the one of the first physician workforce datasets released by the AAMC since its 2021 report, *The Complexities of Physician Supply and Demand: Projections from 2019 to 2034.*[2] The two reports are not directly comparable, as the dashboard provides current granular data on subsets of physicians while the 2021 report used data modeling to predict future workforce numbers. But combining the 2021 predictions with the current dashboard, additional data from the AAMC, ACS data, and other information, enables examining the surgical workforce today and generate insights into current and future surgeon supply, demand, and distribution in the US.

Losing Ground

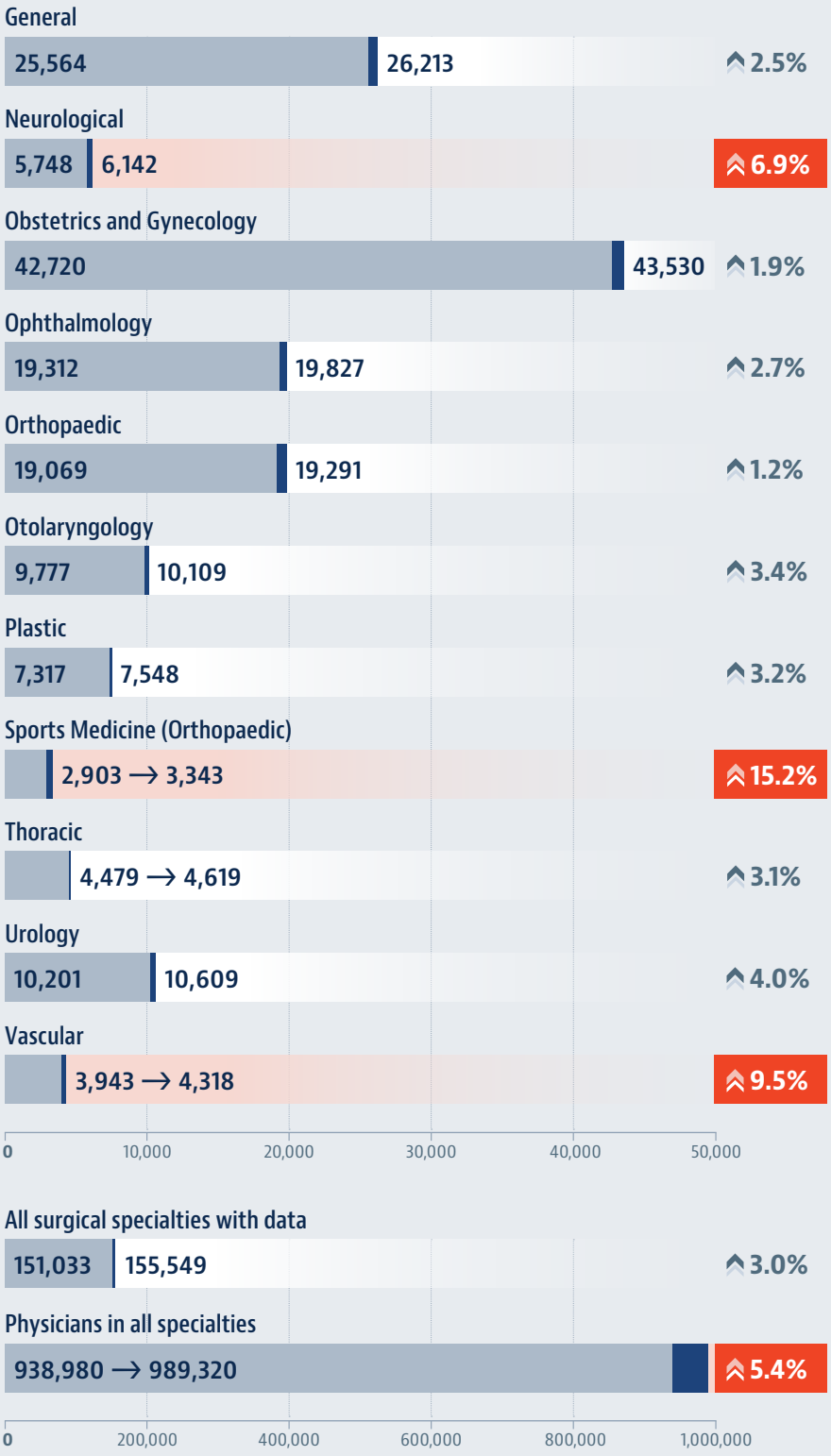
In its 2021 report, the AAMC quantified the supply of surgeons across all surgical disciplines in 2019 at 152,700. It also projected a shortage by 2034 of 15,800 to 30,200 surgeons relative to demand, a large part of a shortfall of 37,800 to 124,000 physicians overall in the same period. In a just-released 2024 report,[3] the AAMC updated the total projected shortage to 13,500 to 86,000 physicians by 2036, including a predicted shortfall of 10,000 to 19,900 surgeons (in other words, as much as 74% of the total).

In the shorter term, the 2021 and 2024 reports both projected that in 2024, the US public would need the services of approximately 160,000 surgeons, an increase of approximately 4.8% over the number in 2019, provided the status quo (of various aspects of the surgical workforce, including retirement age) was maintained. Other scenarios mapped the workforce in conditions other than the status quo, all of which resulted in a similar approximate level of demand in 2024.

The just-released AAMC dashboard can be compared with separate AAMC data[4] published in 2019, providing the number of surgeons in various specialties as of December 31, 2018—the timeliest match to the 2019 estimates in the 2021 report. In other words, the recent predictions of surgeon supply[2,3] can be roughly compared with the current reality.[4] Has surgeon workforce growth, per the new dashboard, kept up with projected demand?

The news is not encouraging. Per the AAMC data,[1,4] the number of surgeons in a range of surgical specialties grew by an average of 3.0% between late 2018 and late 2022 (see Figure 1, page 29), while physicians in all medical specialties (surgical and nonsurgical) grew by 5.4% in the same period.

Figure 1.* Number of Physicians in Surgical Specialties by Year[1,3]



Number of surgeons as of:

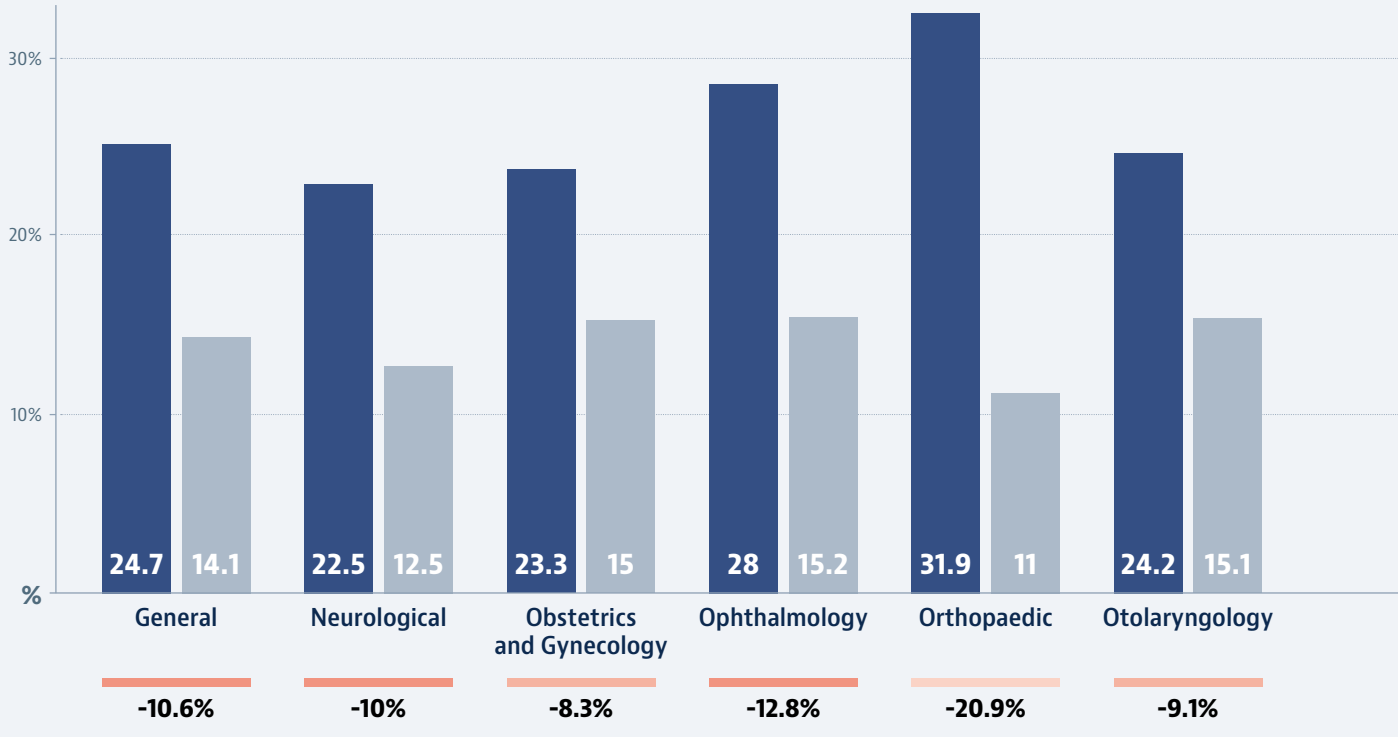
- December 31, 2018
- December 31, 2022

The AAMC datasets do not include separate entries for cardiac, colorectal, oral and maxillofacial, and pediatric surgeons.

*The difference between the 152,700 surgeons the AAMC counted in 2019[2] and the smaller number in these 2019 AAMC data[3] may be attributable to surgeons in specialties with fewer than 2,500 active physicians, who are captured[3] as a single, undifferentiated group and thus omitted here.

In 2024, the US public will need the services of approximately 160,000 surgeons, an increase of **approximately 4.8% over the number in 2019.**

Figure 2. Percentages of Surgeons in Select Specialties by Age Group[1,4]



This suggests that surgeons are experiencing larger-than-average shortfalls at present.

Notably, several surgical specialties are growing at large rates, particularly sports medicine-orthopaedic surgery, which increased its workforce by 15.2% since 2019. Vascular surgery (9.5%) and neurological surgery (6.9%) also gained surgeons in larger proportions than the overall physician and surgeon workforces did. All other specialties, however, gained less than 4.6% in this 4-year span, including one (orthopaedic surgery, a category listed separately from sports medicine-orthopaedic surgery) with an increase of just 1.2%. Although the total number of surgeons in late 2022 was 155,549—not very far from the projected demand[2,3] of approximately 160,000—these data suggest that much of surgery is currently losing ground relative to growing population needs.

Aging into a Surgeon Shortage

Of course, a period of 4 years is too brief to show the full manifestation of a long-term workforce shortage. While the declines to this point may be disheartening, the full extent of the predicted shift likely has not yet arrived.

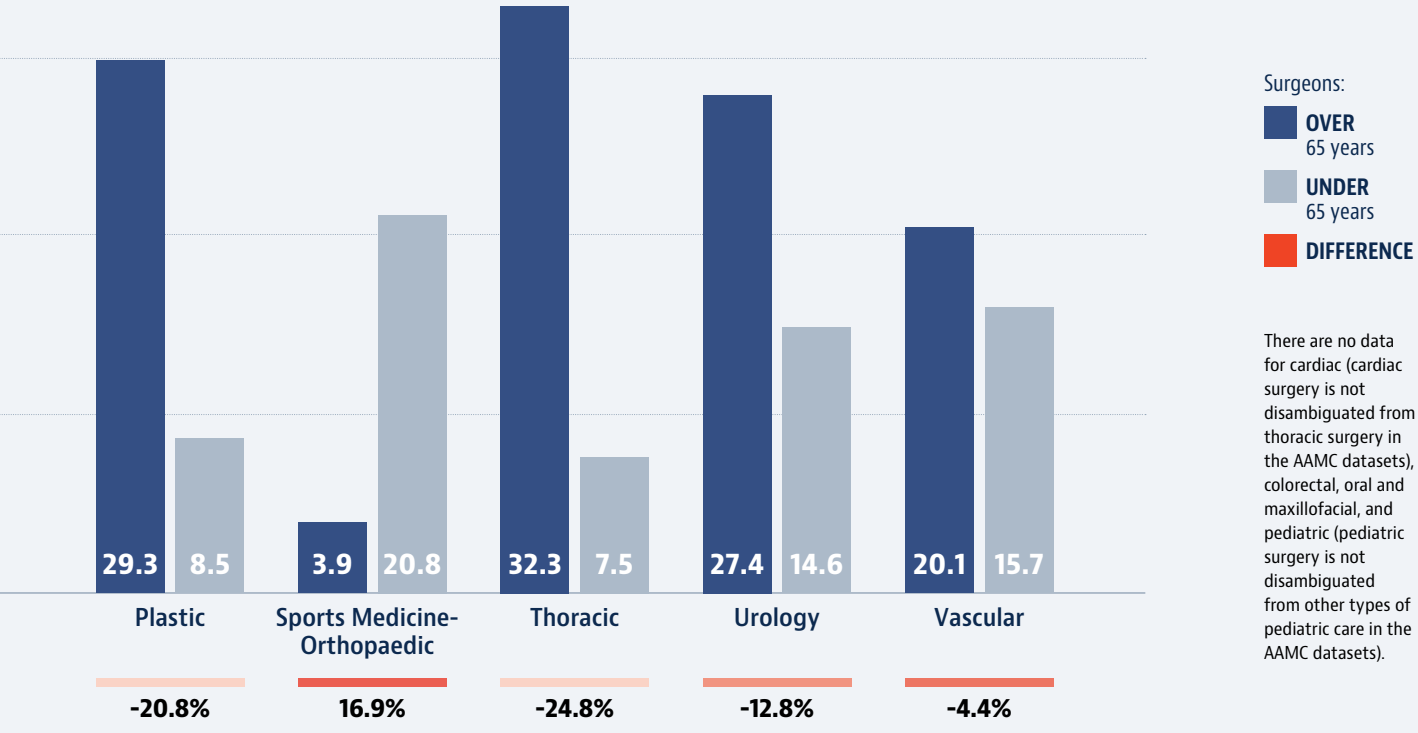
Indeed, population pressures point to intriguing issues that will affect surgery greatly—despite their origination far beyond the field.

The US, like much of the world, is facing a rapidly aging population, with the percentage of elderly people increasing relative to the full population. The US is not yet facing a decline in population size, thanks to lengthening lifespans and net gains from immigration. Nonetheless, every available statistic on population growth shows flat or declining rates.[5] The US joins the two-thirds of the global population in experiencing a national fertility rate below the threshold population replacement rate;[6] the US birth rate has been below replacement since 2007.[5] In sum, the workforce is aging overall, with many people approaching retirement, relatively few younger people replacing them, and an expectation that the pattern will only increase in intensity in the future. This shift is slowing labor pool growth throughout much of the world.

Amid this global sea change, US surgeons face a triple burden of aging.

First, the population of physicians is more aged than that of the country overall. Per the AAMC

The surgeon shortage means that, as surgeons over age 65 retire, surgery likely will face widespread workload challenges.



There are no data for cardiac (cardiac surgery is not disambiguated from thoracic surgery in the AAMC datasets), colorectal, oral and maxillofacial, and pediatric (pediatric surgery is not disambiguated from other types of pediatric care in the AAMC datasets).

dashboard, by the end of 2022, 23.2% of active physicians were age 65 or older,[7] a percentage nearly 40% greater than that of the same age group in the full US population (16.8%).[8] Among surgeons alone, the AAMC dashboard showed that 39,759 of 155,549, or 25.6%, were older than 65 years. For five surgical specialties (ophthalmology, orthopaedic, plastic, thoracic, and urology), the percentage older than 65 years is even higher (see Figure 2, this page). Just one specialty (sports medicine-orthopaedic) has a percentage of surgeons under age 40 that is larger than the percentage over age 65. All other surgical specialties have smaller populations in the younger generation than the older generation.

Statistical tests suggest the growth in surgeon specialties between late 2018 and late 2022 is partly attributable to the ability of a specialty to retain surgeons younger than 40. The Spearman ranked correlation coefficient between the percentage of surgeons older than 65 years and the growth in surgeon population is -0.64—a moderately strong negative correlation. Similarly, the percentage difference between surgeons older than 65 and those younger than 40 is negatively correlated with surgeon population growth (correlation coefficient, -0.55). Most growth, in other words, is coming from recruiting surgeons under 40; only this statistic had a positive association with change in surgeon population (correlation coefficient, 0.45).

The surgeon shortage means that, as surgeons over age 65 retire, surgery likely will face widespread workload challenges. The decline may have already begun, and it will certainly speed up over the next 5 to 10 years.

Meanwhile, population-wide aging will further complicate the balance of workers. The 2021 AAMC projections suggest offsetting a surgeon shortage by increasing the number of other surgical team members, such as nurse practitioners. But the aging of the broader workforce[9] means this may prove challenging, as workers may simply not be present for recruitment.

Finally, many surgical specialties will face a higher workload as surgical needs increase with age across the entire population. The smaller workforce won't face today's surgical demands, in other words, but rather, in many specialties, significantly increased needs.

Some have espoused that the problem is simply not about shortage at all, but rather maldistribution of surgeons across the US.

The 2021 AAMC report projects small shifts in surgeon shortages based on the retirement age of the existing surgical workforce. Factoring in a pattern of retirement 2 years earlier or later than the current typical age (65 years) contributes to the range in their estimated shortfall of 10,000 to 19,900 surgeons by 2036. The current dashboard, helpful in illuminating the overall issue, offers no further insight into these possible changes over time.

How Many, How Old, and Where?

Belying the AAMC workforce predictions, some have espoused that the problem is simply not about shortage at all, but rather maldistribution of surgeons across the US. The idea is that surgeons may favor living and working in urban areas, not least of all because they tend to attend surgical residencies clustered within one of several US cities. Some surgeons have posited that this is why surgeons in rural areas are often in critically short supply. Read more about this issue in the March 2024 *Bulletin*.

Can the new AAMC dashboard shed more light on the maldistribution and shortage as the primary surgical workforce issues?

The dashboard offers state-level maps of surgeon distributions, which show dramatic differences between some rural and urban places. Take New Hampshire, one of the most rural states in the US, versus Washington, DC, for instance. Washington, DC, with an entirely urban population of 689,545, has 167 general surgeons, or 24.1 for every 100,000 people. New Hampshire, with a population of 1,402,054 (41.7% of them rural), has 136 general surgeons, or 10.0 per 100,000 population—less than half the amount in the District of Columbia (see more data in Figure 3, pages 34–35).

But the pattern is not absolute. Some states are both largely urban *and* relatively underserved. California, with a population of 39.37 million people (just 5.8% of whom are rural) and 2,923 general surgeons,[1] has 7.1 general surgeons per 100,000 people—notably fewer than much more rural New Hampshire.

The real difference in rural versus urban areas may lie in surgical demand, rather than supply. This is because some rural populations have a notably higher median age than the national population, and increased age often correlates with increased surgical needs. Comparing states by their percentages of rural population and population older than 65 through non-AAMC data[10-12] shows a correlation coefficient of 0.27—indicating a weak-to-moderate connection between dwelling in a rural area and being in this older age group.

Comparing these population-level data with a 2021 AAMC state-by-state physician workforce report[13] reveals similar correlations between the percentage of a state dwelling in rural areas and general surgeons per 100,000 people (correlation coefficient, 0.25) or the elderly percentage of the population and the number of general surgeons (correlation coefficient, 0.36).

In other words, surgeons are neither systematically avoiding more rural states (which would yield a negative correlation coefficient) nor gravitating toward them (a larger positive correlation coefficient than the correlation of rurality and old age). A maldistribution of surgeons in urban versus rural areas may not be discoverable via state-level data. Nonetheless, these data suggest surgeons may not be selecting a state for practice based on the elderly population of that state.

What the AAMC Data Can and Cannot Tell Us

Examining the AAMC data makes it clear that the full pattern of surgeon supply and demand across geographic locations, surgical specialties, and age groups is complex, challenging, and in the midst of pivotal change.

The long-term outlook for surgery appears to include large-scale workforce changes for most surgical specialties. As most of the world faces a generational shift in the labor pool, the US must consider how best to meet the needs of more patients with fewer surgeons. This may include advocating for more surgeons to practice in rural areas where patient needs are particularly strong—an effort the ACS is already spearheading through its Division of Advocacy and Health Policy. Read more on those efforts in the February 2022 *Bulletin* article, "Data Reveal the Details about the Surgeon Workforce Shortage."

Key Facts

4.8% Approximate projected necessary increase in surgeon workforce between 2018 and 2022

3% Actual increase in surgeon workforce in that time frame

16.8% Percentage of the US population over 65 years

25.6% Percentage of active surgeons in the US age 65 or older

-0.64 Correlation coefficient between growth in surgeon workforce and percentage of surgeons over 65 years

0.25 Correlation coefficient of rural population percentage and number of general surgeons per 100,000 population

What is less clear is what this epochal change may mean for ensuring optimal care for surgical patients. This is in part because dynamic, complex changes will affect surgical workforce needs as technological innovation, shifting lifestyles, international migration (including of international medical graduates), and other factors reshape epidemiology and the surgical workforce, potentially altering how many surgeons a population needs and how surgeons work. B

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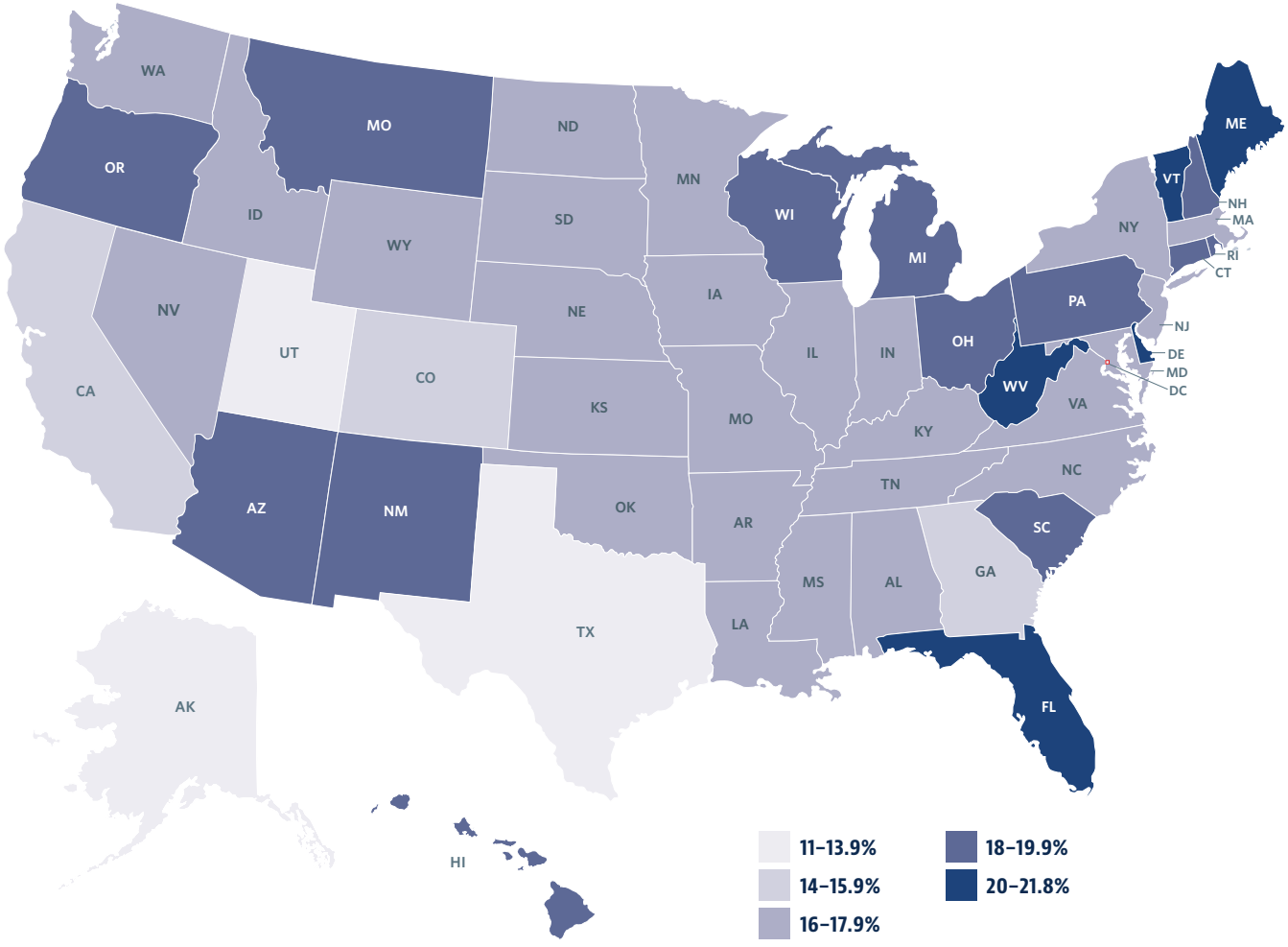
Figure 3. States by Percentages of Rural Populations and General Surgeons[10-13]

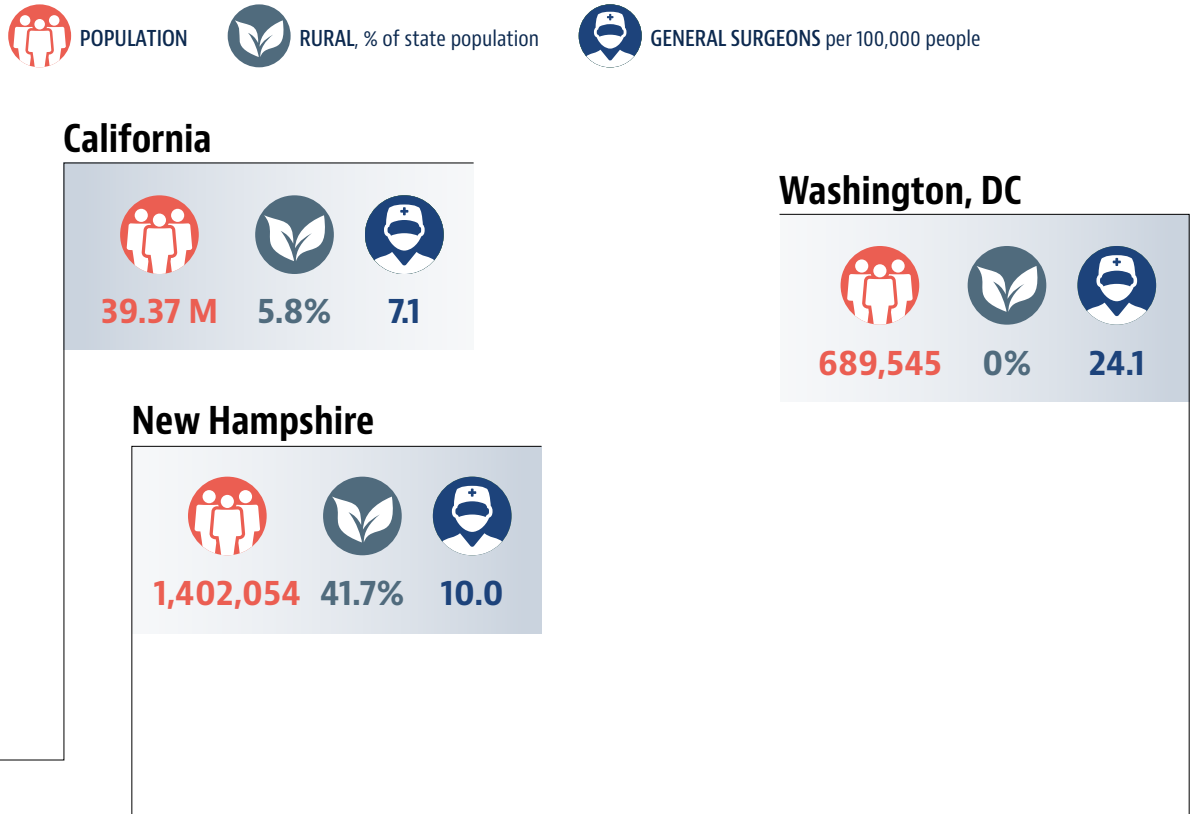
Percentage of state population age 65 years and older[9,10]



AL	AK	AZ	AR	CA	CO	CT	DE	FL	GA	HI	ID	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO
RURAL, % of state population[11]																								
42.3	35.1	10.7	44.5	5.8	14	13.7	17.4	8.5	25.9	13.9	30.8	13.1	28.8	36.8	27.7	41.3	28.5	61.4	14.4	8.7	26.5	28.1	53.7	30.5
GENERAL SURGEONS per 100,000 people[12]																								
7.7	9.4	6.9	7.2	7.1	8	8.5	7.4	7	6.9	9.3	5.5	7.1	6.5	7.4	7.2	8.1	8.9	11.9	9.2	9.5	7.7	7.4	7	7

Some states are both largely urban and relatively underserved.

California, with a population of 39.37 million people (just 5.8% of whom are rural) and 2,923 general surgeons, has 7.1 general surgeons per 100,000 people—notably fewer than much more rural New Hampshire.



	MT	NE	NV	NH	NJ	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VT	VA	WA	DC	WV	WI	WY
RURAL, % of state population[11]	46.6	27	5.9	41.7	6.2	25.5	12.6	33.3	39	23.7	35.4	19.5	23.5	8.9	32.1	42.8	33.8	16.3	10.2	64.9	24.4	16.6	0	55.4	32.9	38
GENERAL SURGEONS per 100,000 people[12]	10.1	7.3	5.7	10	7.4	7.6	10.1	7.1	10.4	8.2	5.8	9.5	8.5	9.9	7.1	9	8.1	6.2	5.8	11.5	7.2	7	24.1	10.1	8	9.8

Dr. James Elsey

Artificial Intelligence: The Future Is Now

James K. Elsey, MD, FACS

It is impossible for even the most casually engaged citizen to avoid being fascinated as well as concerned over the future societal and scientific impact that the current artificial intelligence (AI) revolution will have on the world around us.

THE LAY GOVERNMENTAL and scientific press are filled with daily exposés on its transformative power as well as its inherent dangers. Most relevant to our profession, in his recent book, *The Coming Wave,* Mustafa Suleyman proclaimed AI and genetic engineering will completely change the way medicine is taught, practiced, and studied in the future.

The exponential speed of AI development (currently making a mockery of Moore's Law), as well as its remarkable ability to self-learn, positions this technology to be a real Darwinian force of societal, political, and scientific evolution. The positive effects of this in the field of medicine are inestimable. The instant availability of big data, the useful power of its ever-evolving algorithms, and its access to anyone with a smartphone will have positive and transformative value in the way we learn our art, treat our patients, carry out research, engage our medical deserts, reduce medical disparities, and improve societal health.

Similarly, it is reasonable to predict that current and future evolutions in genome understanding and genetic engineering will soon become mainstream disease treatment modalities, rapidly making much of our current traditional care obsolete. Breakthrough genetic-based treatments of sickle cell disease (recently approved by the U.S. Food and Drug Administration),[1] cystic fibrosis, HIV, and many cancers are evolving every day. I frequently tell my medical students that the future of medicine is in the genes. I believe that will be proven correct.

Inherent in these positive attributes is an equally dystopian side to this ever-evolving technology. Malevolent and sinister forces can easily harness these powerful, influencing information sources to create destabilizing scientific, political, and societal harm on a grand scale. Gordon Crovitz, a co-chief executive of NewsGuard, was recently quoted in a *New York Times* article saying that AI "is going to be the most powerful tool for spreading misinformation that has ever been on the Internet" and that "Crafting a new false narrative can now be done at a dramatic scale."[2]

Similarly concerning, a recent report from Georgetown University's Center for Security and Emerging Technology stated that new AI systems called generative language models have made progress in Chatbot self-generation of increasingly credible and persuasive misinformation.[3]

It is not too much of a futuristic stretch to see how these uncontrolled forces can lead us into a *1984* Orwellian world of multiple "ministries," creating confusion, mistrust, and chaos. This could have a devastatingly damaging effect on the practice of medicine. Significant adverse effects could include loss of patient confidence, mistreatment, avoidance of therapy, contamination of research, degradation of data, and—through cyberattacks—complete disruption of the Health Insurance Portability and Accountability Act sanctity of personal medical information. These and other unforeseen effects could ultimately destroy the preeminent foundational characteristic upon which the entire practice of medicine depends—trust. Without trust, our system collapses.

I recently spotted a bumper sticker that said, "Let's Make Orwell Fiction Again." Hopefully,

that is more comedic relief than a prescient warning of things to come. Similarly, the rapid development, progressively reduced costs, and widespread availability of DNA sequencing pose a significant danger to society in the wrong hands. It may be possible for rogue forces to synthesize DNA capable of creating dangerous and possibly destabilizing ultra-transmissible superbugs and powerful diseases.

Like atomic energy, we have created forces that can serve or damage us greatly. We may very well be at a true Oppenheimer moment. How we as a society and a profession hedge against the possible malevolent risks of these powerful technologies without throttling their enormous benefits is one of the sentinel questions of our times. Unfortunately, this conundrum is complicated by the fact that only some of the current developers of these systems completely understand or can predict their future capabilities.

What should be clear to all of us, however, is that a watch-and-see, laissez-faire, or—worse—a dismissive approach to these technologies exposes our profession as well as our society to potential catastrophic damage from well-intention but sophomoric mistakes of both omission as well as commission.

The proper adoption as well as risk mitigation of these technologies will be an ongoing Herculean intellectual, physical, and monetary effort. Multiple governmental, academic, and technological professional agencies and societies will have to rapidly become facile and dedicated to this task. Partial engagement or maladroit approaches will not only result in missed opportunities but could harm our profession and society in general.

Fortunately for the profession of surgery, the ACS stands on the wall of truth as a vanguard against misinformation and malevolent interests. The foundational mission of our great College is ensuring the integrity of surgical data, the veracity of the resultant information, and wisdom in its application.

Consistent with this charge, through the visionary leadership over the last decade, the College has significantly invested in the massive accumulation of dependable data, world-renown talent, and internationally recognized quality and educational programs, making it the accepted world's imprimatur of surgical truth and professional standards. However, these technologies' current and rapidly evolving power could pose significant existential challenges as the College attempts to lead the surgical profession through these unchartered seas. The future quality and safety of our art will depend on the clarity of the ACS vision and the quality of its debates, as well as the courage of its leadership.

The College saved our great profession at its inception years ago from the chaos of misinformation and the ill effects of unscrupulous therapies. I believe it can and will do it again. Unfortunately, time is not on our side. We have no time to lose. The future is now!

Disclaimer

The thoughts and opinions expressed in this viewpoint article are solely those of the author and do not necessarily reflect those of the ACS.

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ACS AMERICAN COLLEGE OF SURGEONS

Vivek Singh

Dr. Daniel Hashimoto

Artificial Intelligence: The Future Is What We Make It

Vivek Singh
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AS MEMBERS OF THE ACS HEALTH Information Technology (HIT) Committee, we appreciate Dr. Elsey's insights and share his concerns regarding the potential risks associated with artificial intelligence (AI) in healthcare. The proper adoption and risk mitigation of these technologies will indeed require a concerted effort from multiple stakeholders, including governmental agencies, academic institutions, and professional societies like the ACS.

Partial engagement or poorly executed approaches could result in missed opportunities and potential harm to both the surgical profession and society. Trustworthiness of AI technologies, which relies on factors such as digital literacy and AI literacy among healthcare professionals and patients alike, is a key area of concern. The fear surrounding AI is reasonable, and this unease can be mitigated by educating surgeons on AI principles and fostering a deeper understanding of these technologies within our community.

Today, AI is often viewed as possessing seemingly limitless potential. AI advocates and skeptics highlight this in their discussions of the risks and benefits that may result from widespread AI adoption. However, expectations surrounding these risks and benefits may be tempered when one considers the significant limitations of current AI technologies.

"Enchanted determinism," a cognitive bias that arises when a lack of understanding of technical principles leads one to view the technology as magical, has certainly impacted perceptions of AI applications for healthcare.[1] Painting AI as limitless stimulates creativity around potential use cases but also risks distracting from immediate problems and issues that plague healthcare AI, such as lack of quality data, inequalities in access to healthcare that bias data, unequal access to datasets, and inappropriate or misleading use of metrics to measure algorithmic performance.[2] The "last mile" problem in healthcare AI will be difficult to overcome and will limit meaningful applications of AI unless clinicians, supported by our representative societies such as the ACS, become AI literate.[3]

Effective and safe implementation of AI technologies into clinical workflows will require tremendous effort among all stakeholders. The most successful translational advances in healthcare AI have combined the expertise of clinicians and computer scientists.[4] For these types of collaborations to occur, clinicians must possess the ability to engage in a meaningful dialogue with the developers of AI tools.

Like the wave of digital health technologies that came before it, AI demands its own unique set of competencies, termed AI literacy. Basic skills in areas such as statistics, data science, and computer science

The ACS also can serve as a forum to engage in a meaningful dialogue about the future development of surgical AI, including concerns surrounding trust, privacy, and equity. As research and commercial interest grow, AI will become more of a part of surgeons' daily lives.

are foundational to the ways AI tools function; however, clinicians have traditionally demonstrated low performance in these domains.[5-7] Moreover, AI literacy has never been objectively measured in clinicians.

Thus, there is an urgent need for educational efforts aimed at closing this AI literacy gap in clinicians. As Dr. Elsey alludes, there are risks associated with AI use in high-stakes settings. To mitigate these risks, surgeons must know, understand, evaluate, and contribute to the development of AI tools.

The ACS is uniquely suited to support the development of AI literacy initiatives among surgeons. The *Journal of the American College of Surgeons* has already published a great deal of scientific research on applications of AI in surgical settings, and the ACS has released an online course for surgeons to learn more about AI and data science.[8] In addition, the ACS has spent considerable effort gathering surgeon-scientists with expertise in AI to lead initiatives like the HIT Committee, which includes an AI subcommittee.

As AI begins to integrate itself into clinical workflows, the College can help develop AI literacy among surgeons in several ways. First, the ACS can function as an educational body and house materials related to foundational principles in AI, data science, statistics, and other domains. While AI itself is an expansive (and still rapidly expanding) field, applications in surgery are relatively nascent. As surgical AI methodology becomes more common in surgical research, it will become necessary for surgeons to understand the methods used in these papers to offer substantial critique.[2,9,10] Moreover, the current limitations of AI models are still widely misunderstood by the general public, perpetuating "enchanted determinism" and perceptions of AI's applications as limitless. Mitigating this bias will be crucial in the appraisal of AI research and technologies directed toward surgeons.

The ACS also can serve as a forum to engage in a meaningful dialogue about the future development of surgical AI, including concerns surrounding trust, privacy, and equity. As research and commercial interest grow, AI will become more of a part of surgeons' daily lives. Likewise, there should be ample opportunities for surgeons to share their experiences with AI technologies, whether positive or negative.

In the scientific literature, AI models are often evaluated by certain performance metrics that may or may not reflect the stated goals of their creators.[2] However, in clinical settings, models also will be evaluated by way of user experience. Whether surgeons find AI technologies acceptable for their stated uses will be a crucial component of their translational success. As such, user experience considerations should be

integrated into the process of model development using insights gained from surgeons.

Finally, the ACS can establish professional standards for the appropriate use of AI applications in surgical settings and communicate this to the public. The landscape surrounding AI is in a state of flux, but the College can continue its role in advocating for our patients by promoting laws and regulations that protect surgeons and patients while enabling the research and development necessary to drive surgical innovation.

Disclaimer

The thoughts and opinions expressed in this viewpoint article are solely those of the authors and do not necessarily reflect those of the ACS.

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Understanding Surgical CPT Coding Essentials Will Help Ensure Proper Reimbursement

Megan McNally, MD, FACS, Jayme Lieberman, MD, FACS, and Jan Nagle, MS

Numerous Current Procedural Terminology (CPT)* coding questions raised during ACS coding courses and received via the ACS Coding Hotline underscore the need to explain key coding concepts in order to ensure accurate coding.

THIS ARTICLE EXAMINES CRUCIAL CODING CONCEPTS through fictional cases that should be familiar to general surgeons and related surgical specialties.

Laparoscopic Liver Biopsy

Case: While performing a laparoscopic appendectomy for appendiceal carcinoma, the surgeon also performs a liver biopsy of a suspicious lesion. Reportable codes include the following: 44970, *Laparoscopy, surgical, appendectomy,* and 47379, *Unlisted laparoscopic procedure, liver.*

Concept: It would not be appropriate to report add-on code 47001, *Biopsy of liver, needle; when done for indicated purpose at time of other major procedure* (List separately in addition to code for primary procedure), for the biopsy procedure. The intent of code 47001 has always been for a liver biopsy at the time of an open procedure as discussed in the AMA CPT Assistant 1992 Code Update (Winter 1991) after code 47001 was established. Additional CPT Assistant articles have reinforced that 47001 may only be reported for a liver biopsy via an open approach. Therefore, code 47379 should be reported when a liver biopsy is performed via a laparoscopic approach in addition to a laparoscopic primary procedure and add-on code 47001 should be used as a "proxy" for charges. This information supersedes guidance that was provided in the October 2018 ACS *Bulletin* column "CPT Coding for Hepatobiliary Surgery."

Case: A patient with hepatocellular carcinoma underwent an exploratory laparoscopy to obtain a liver biopsy and assess the peritoneal cavity to exclude advance disease. The reportable code is 47379, *Unlisted laparoscopic procedure, liver.*

Concept: It would not be appropriate to report 49321, *Laparoscopy, surgical; with biopsy (single or multiple)* if the biopsy is the only laparoscopic procedure performed as this code is in the Abdomen, Peritoneum, and Omentum subsection of CPT and not the Liver subsection. For this clinical scenario, code 47379 should be reported and code 49321 should be used as a "proxy" for charges. This information supersedes guidance that was provided in the October 2018 ACS *Bulletin* column "CPT Coding for Hepatobiliary Surgery."

Laparoscopic Appendectomy for Perforation

Case: A patient undergoes a laparoscopic appendectomy for perforated appendicitis requiring significantly more work than a typical laparoscopic appendectomy. The reportable code is 44970, *Laparoscopy, surgical, appendectomy.*

Concept: Although there are separate codes to differentiate an open appendectomy without rupture (44950) and with rupture (44960), there is only one code for a laparoscopic appendectomy (44970), and it is used to report a laparoscopic appendectomy for either scenario; with rupture or without rupture. It would not be correct to report 44979, *Unlisted laparoscopy procedure, appendix for a laparoscopic appendectomy for perforation with abscess and peritonitis* and use the open code 44960, *Appendectomy; for ruptured appendix with abscess or generalized peritonitis* as a "proxy" for charges. However, depending on the amount of extra time and/or work effort required when compared to a laparoscopic appendectomy without rupture, it may be appropriate to append modifier 22, *Increased procedural services.* Documentation must support the substantial additional work and the reason for the additional work (i.e., increased intensity, time, technical difficulty of procedure, severity of patient's condition, physical and mental effort required).

Adjacent Tissue Transfer after Breast Surgery

Case: Immediately following a lumpectomy, the surgeon performs reconstructive tissue rearrangement including dissection through the breast parenchyma in order to create a pedicled flap of breast tissue that is then transposed into the defect to improve the contour of the breast. Reportable codes include the following: 19301, *Mastectomy, partial (e.g., lumpectomy, tylectomy, quadrantectomy, segmentectomy)* and code(s) for adjacent tissue transfer as appropriate (14000-14041, 14301-14302).

Concept: Reporting adjacent tissue transfer for immediate, partial breast reconstruction following lumpectomy is possible, although it requires the specific criteria for reporting adjacent tissue transfer.

In addition to a description of the defect, it requires full documentation of the incisions required to create the pedicled flap of breast tissue, preservation of vascularity, the dimensions of the tissue mobilized, and the technique for transfer of the tissue into the defect. Undermining of the breast tissue off the pectoralis major muscle alone or undermining tissue within the breast parenchyma to advance tissue for primary repair is not considered adjacent tissue transfer and is bundled with the partial mastectomy code and not separately reportable.

Endocrine Surgery

Case: A patient underwent a right thyroid lobectomy years ago. It is now necessary to go back and remove the rest of the right lobe and also remove the left lobe (previously untouched). Reportable codes include the following: 60260-RT, *Thyroidectomy, removal of all remaining thyroid tissue following previous removal of a portion of thyroid,* and 60220-LT-59, *Total thyroid lobectomy, unilateral; with or without isthmusectomy.*

Concept: This reporting is based on the fact that 60260 is considered a bilateral procedure and since the left lobe was previously untouched, it would be incorrect to report a code for removal of remaining tissue when a total lobectomy is performed.

Case: A patient had a left lobectomy on March 1. On March 14, the patient is taken back to surgery by the same surgeon for a right thyroid lobectomy after pathology showed a malignancy in the right thyroid lobe. Reportable code for the first operation: 60220-LT, *Total thyroid lobectomy, unilateral; with or without isthmusectomy.* Reportable code for the subsequent operation: 60220-RT-58.

Concept: Modifier 58 is appended to the second operation because it was a "staged or related procedure or service by the same physician or other qualified healthcare professional during the postoperative period."

Learn More

The ACS collaborates with KZA, Inc. on courses that provide the tools necessary to increase revenue and decrease compliance risk. These courses are an opportunity to sharpen your coding skills. You also will be provided online access to the KZA alumni website, where you will find additional resources and other FAQs about correct coding. Information about the courses can be accessed at *KZANow.com/national-conferences.*

In addition, as part of the College's ongoing efforts to help members and their practices submit clean claims and receive proper reimbursement, a coding consultation ervice—the ACS Coding Hotline—has been established for coding and billing questions. ACS members are offered five free consultation units (CUs) per calendar year. One CU is a period of up to 10 minutes of coding services time. Access the ACS Coding Hotline website at *prsnetwork.com/acshotline.* B

Dr. Megan McNally *is a surgical oncologist at Saint Luke's Health System in Kansas City, Missouri, and assistant clinical professor in the Department of Surgery at the University of Missouri-Kansas City School of Medicine. She also is a member of the ACS General Surgery Coding and Reimbursement Committee and an ACS advisor to the AMA CPT Editorial Panel.*

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ACS AMERICAN COLLEGE OF SURGEONS

ACS Cancer Conference Highlights Quality Efforts, Current Complexities in Cancer Care

Sheila Lai, MA

While deaths from cancer have dropped dramatically in the past 3 decades—by approximately one-third—cancer remains the second leading cause of death in the US, behind only heart disease, and an estimated 1 in 3 Americans will be diagnosed with cancer in their lifetime.[1,2]

NEW CANCER TREATMENTS ARE emerging at an increasingly rapid pace, but access to these treatments remains highly variable, and large gaps exist in understanding the complex needs of patients with cancer, who must often manage treatment-related complications years after their treatments end, as well as the distinct needs of their family members and caregivers.

Focused on understanding and addressing such complexities in cancer care—and on helping Commission on Cancer (CoC)-accredited sites provide quality care—this year's ACS Cancer Conference brought together nearly 500 surgeons, allied healthcare providers, program directors, oncology data specialists, and accreditation specialists to discuss the latest in cancer care and research. Registration increased by more than 30% compared with 2023.

Kicking off with a sold-out preconference workshop focused on quality improvement (QI), attendees heard from more than 50 moderators and panelists who provided updates on local and national QI projects and led thematic discussions on incorporating health equity into cancer care and raising surgeons' voices in advocacy at the state and national levels.

"The goal of this year's ACS Cancer Conference is to provide comprehensive, practical information about new standards, data collection, site visits, staging, and accreditation all in one setting," said Laurie J. Kirstein, MD, FACS, a breast surgical oncologist from Memorial Sloan Kettering Cancer Center in New York, New York, and the 2024 ACS Cancer Conference Chair. "We're trying to do all of this in one forum so that when you leave here, you can take this information, go back to your program, and take care of everything you need to for the rest of the year."

Improving Quality at the Local and National Levels

QI often can seem like a daunting concept, but never has it been more important than in cancer care, where access to treatment can depend on multiple factors, including where patients receive their care and if they're able to make the myriad appointments that come with a cancer diagnosis.

"Everybody in the hospital needs to be thinking about quality, and if you're going to do that, you can't have barriers for people to get involved,"

Opposite page: ACS Cancer Conference Chair Dr. Laurie Kirstein welcomes attendees to Austin, Texas, for the 2024 ACS Cancer Conference.

Panelists discuss past, present, and future QI efforts focused on enhancing cancer care, including the PROMPT study and Just ASK national QI project.

advised Daniel J. Boffa, MD, MBA, FACS, director of clinical affairs for the Thoracic Surgery Program at Yale Medicine in New Haven, Connecticut, and Chair of the CoC Quality Assurance and Data Committee.

Dr. Boffa moderated several sessions on quality where panelists highlighted the importance of engaging teams from the ground up. Describing best practice examples, presenters walked attendees through frameworks that worked in their local environments:

Show Value in Change, Don't Just Tell People to Be More Careful

"Telling people to be more careful is one of the weakest reduction strategies when it comes to human beings in complex environments, because all humans make errors," said Christine Garcia, MD, MPH, an assistant professor of medicine and director of quality and patient safety at Weill Cornell Medicine in New York, New York. Dr. Garcia described an initiative to reduce medication waste at an oncology infusion area in her hospital system, emphasizing that understanding the process from end to end and simplifying or automating processes when possible were key steps to helping her team develop a new practice clearance process to reduce medication waste.

Leverage Opportunities to Participate in National QI efforts

Several national QI projects led by the CoC and National Accreditation Program for Breast Centers (NAPBC) are also at the forefront of breaking down barriers to cancer care. One initiative—Patient Reported Observations on Medical Procedure Timeliness (PROMPT) for Breast Patients—is assessing various timeliness aspects of breast cancer, including time to treatment and patients' perceptions of timely care.

Shelby Murphy, BSN, RN, CPHQ, a clinical quality consultant at Presbyterian Cancer Care in Albuquerque, New Mexico, noted that participating in PROMPT helped her hospital system better understand the barriers that many women may face to screening, which is especially important given that New Mexico has one of the lowest up-to-date screening mammography rates in the nation.[3]

To encourage screening, her team spearheaded a QI initiative focused on telephoning eligible patients who were not up to date on their screening mammograms to provide education. "With a high number of patients who need a screening mammogram, access to timely appointments is vital to ensuring adequate care for these patients," she said.

Keynote Address: Improving Cancer Care for All

Offering a scoping national perspective on emerging cancer treatments and prevention efforts, James Gulley, MD, PhD, FACP, clinical director of the National Cancer Institute, described the need to improve cancer care throughout the continuum—opportunities to decrease cancer death exist through prevention, early detection, and better therapies.

Innovations such as vaccines, multicancer detection assays, and cell therapy are examples of emerging technologies that are rapidly changing how cancer is both prevented and treated. More progress, however, needs to be made to ensure equitable access to these treatments, he noted.

Dr. Gulley stressed that while overall survival rates of cancer have improved in recent decades, significant gaps remain in cancer care. The goal of the reignited Cancer Moonshot is to both reduce the US cancer death rate by 50% in the next 25 years (by

2047) and improve the lives of people and their families living with and surviving cancer. To achieve these goals, cancer death rates must decline faster, from the current rate of decline of approximately 2.3% per year to 2.7% per year.

Throughout his keynote, Dr. Gulley emphasized that preventive efforts through screening and vaccination, as well as improving access to emerging treatments, are equally important in cancer care. For example, increasing the global uptake of the human papillomavirus (HPV) vaccine can have profound implications for preventing cervical cancer and other cancers associated with HPV.

Screening for lung cancer—the nation's most lethal cancer—with a low-dose CT scan is remarkably effective at early detection of the disease but needs to reach far more people to have a greater impact, including at-risk Black and Hispanic patients; and while telehealth can improve healthcare access and quality, large-scale research in diverse clinical settings is needed to optimize its use in cancer care.

"If we can focus on prevention and early detection strategies and better treatment for patients with metastatic disease, and we also focus on the efficiency of the system using tools such as AI, we can improve clinical care for patients as well as clinical outcomes for patients and maybe decrease the rate of death," he said.

Elevating Cancer Care through Advocacy and Community Engagement

Improving cancer care also involves effectively engaging communities and promoting change through effective legislation.

In a session on advocacy efforts to improve cancer care, panelists highlighted the value medical expertise brings to shaping legislation aimed at improving cancer care. While the federal legislative process doesn't always work smoothly, there are opportunities to engage at each stage of the process.

"When you show up to talk to a legislator, you bring with you, much like your lived experiences, a very diverse picture that legislators need to understand," said Timothy W. Mullett, MD, MBA, FACS, medical director of the Markey Cancer Center Network with the University of Kentucky Healthcare in Lexington, and CoC Chair.

Dr. Mullett has been involved with several local and national efforts focused on improving cancer care and access to lung cancer screening. "I think it's imperative that our perspective as surgeons not be diluted. Many legislators will remember that there was someone in their office who has experience, is passionate, and has evidence that supports the direction you want to go in."

Advocacy also takes patience and understanding of the needs of the local community. In a session on incorporating health equity into caring for cancer patients, panelists described effective ways to build trust and break down existing barriers in cancer care.

Shayla Scarlett, MBA, MPA, DipACLM, assistant director of community outreach, engagement, and equity at George Washington Cancer Center in Washington, DC, described six pillars to address health equity: ensure accountability, mitigate bias, diversify leadership, develop workforce pipelines, purchase and invest locally, and address social needs.

Top left:
CoC Chair Dr. Timothy Mullett describes the preliminary results of Just ASK, a national QI project led by the CoC and NAPBC that aims to improve smoking cessation support in cancer care.

Top right:
Alexander Olawaiye, MD, FACS, Chair of the AJCC Education and Promotions Committee, and Carolyn Compton, MD, PhD, discuss updates from the AJCC.

Keynote speaker Dr. James Gulley presents on the theme of the Cancer Conference, "Improving Cancer Care for All."

Scarlett highlighted several projects, including Strengthening Community Reach and Equity by Engaging Neighborhoods (SCREEN), which focuses on increasing breast cancer screening and reducing cancer risk by directly engaging local communities in the greater DC area. The project is helping train community members to become neighborhood health ambassadors and provides community education and digital health support directly to at-risk populations, including Black and Hispanic women, who face barriers to mammogram screening and breast cancer care.

"Complex programs require ample time to fully implement," Scarlett said, noting that the SCREEN project was originally slated to be an 18-month project, but the team quickly realized that things take longer to lift off the ground. "In addition, community collaboration in every aspect of program design and implementation is important."

New Pediatric Accreditation Standards and Other Projects on the Horizon

Several sessions of the conference also highlighted new directions for the CoC and Cancer Research Program, as well as ongoing research initiatives.

Currently, only about 1% of CoC centers are accredited as a pediatric cancer program. Recognizing that children are one of the most vulnerable patient populations to experience cancer, the CoC revised its standards for pediatric specialty accreditation to encourage broader participation. Recent modifications also allow for a facility to be identified as both a CoC facility and pediatric cancer program.

"Children are not just small adults, especially for cancer care. They require very specific, nuanced care," said Richard Glick, MD, FACS, director of pediatric surgical oncology at Cohen Children's Medical Center in Queens, New York, and a member of the CoC Advocacy Committee.

Dr. Glick said that while less than 1% of cancer diagnoses per year are in children, cancer is a leading cause of death in children older than 5 years, and incidence has been slowly increasing. For every child who dies of cancer, 70 life years are lost compared with 14 life years lost in adults. In addition, children often face distinct malignancies, and most solid malignancies in children are treated with multimodalities, including surgery, chemotherapy, and radiation, that may impact their future health. New standards for pediatric accreditation are designed to be more relevant and comprehensive to the unique needs of children with

cancer, including addressing survivorship issues, rehabilitation services, and other measures.

Several other emerging initiatives focused on making quality cancer care more accessible include:

- New National Accreditation Program for Rectal Cancer standards updated to address all current treatment modalities for rectal cancer
- Upcoming release of American Joint Committee on Cancer (AJCC) Staging Online
- Health Equity Toolbox designed to provide education and resources for CoC-accredited programs to assist them in addressing financial toxicity and health literacy issues within their programs
- Changes to the Rapid Cancer Reporting System of the National Cancer Database that will allow cancer programs to receive more timely reports
- Several Cancer Research Program projects, including further refinement of a cancer survival calculator to serve as a comprehensive prognostic tool and understanding the scope of survivorship services offered at CoC sites

Reflecting on future directions, Ronald J. Weigel, MD, PhD, MBA, FACS, Medical Director of the ACS Cancer Programs, expressed gratitude to everyone on the front lines of seeking change in cancer care.

"I want to stress that so much of what we do is dependent upon you. I appreciate the fact that you devote so much of your time and effort to outstanding patient care for those who are having to deal with a cancer diagnosis," he said. "They and the ACS appreciate all the commitment that you have made to taking care of cancer patients."

Additional key insights and lessons learned from the conference, as well as new opportunities for clinical practice and what to expect this year and beyond from the ACS Cancer Programs were discussed by Drs. Weigel, Boffa, Kirstein, and Mullett in a recent episode of *The House of Surgery* podcast series. Visit *facs.org/houseofsurgery* for more information.

Mark your calendars

Next year's ACS Cancer Conference will be held in Phoenix, Arizona, March 12–15. B

Sheila Lai *is the Senior Public Information Specialist in the ACS Division of Integrated Communications in Chicago, Illinois.*

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2. Cancer Facts and the War on Cancer. National Cancer Institute. Available at: https://training.seer.cancer.gov/disease/war/. Accessed March 4, 2024.
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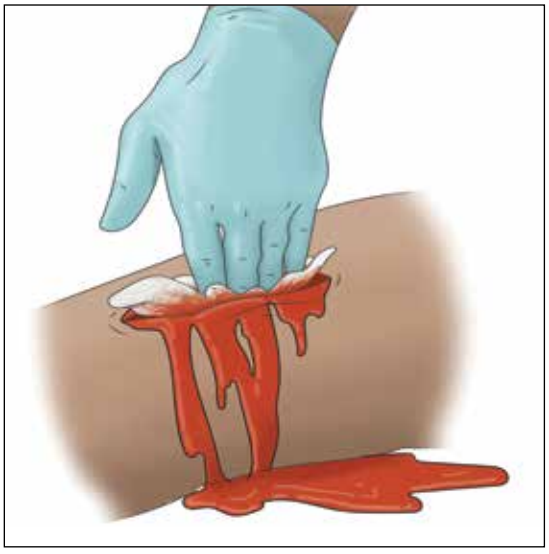
The approximately 500 attendees at this year's ACS Cancer Conference had the opportunity to interact with speakers and moderators during several Q&A sessions.

Trauma Meeting Spotlights New Image-Focused STOP THE BLEED Course

Tony Peregrin

ACS STOP THE BLEED®: Past, Present, and Future—a Special Session at the ACS Committee on Trauma (COT) 2024 Annual Meeting, March 6–9, in Chicago, Illinois—featured a sneak peek at an upcoming version of the STOP THE BLEED didactic (in-person and virtual) course and outlined opportunities for expanding the program.



These new illustrations from version 3 of STOP THE BLEED show how to use a tourniquet and how to pack a bleeding wound.

MORE THAN 550 MEMBERS OF the central and regional COT attended the meeting, which was open to COT members only. The meeting provided updates from the Advocacy, Quality, Injury Prevention, Systems, and Education Pillars, in addition to Spotlight Discussions, which are designed to enhance collaboration and networking opportunities while serving as a conduit for feedback on targeted topics.

Since the STOP THE BLEED initiative launched in 2017, the program, sometimes referred to informally as the "CPR of bleeding," has prepared more than 3.7 million individuals worldwide to control bleeding in an emergency. Ultimately, the goal of the program is to prepare every American in basic bleeding control techniques and install bleeding control kits in every public venue, including schools, community centers, and stadiums.

STOP THE BLEED Version 3

A multidisciplinary workgroup comprising 28 healthcare professionals, including representatives from emergency medical services, nursing, social work, group emergency medicine, and surgery, developed the updated didactic STOP THE BLEED course, which will be released at Clinical Congress 2024 in San Francisco, California.

"We adhered to three principles when discussing how we were going to change the slide set," said Kenji Inaba, MD, FACS, FRCSC, Chair of the ACS STOP THE BLEED Steering Committee:

- Emphasize pictures over words
- Explain basic physiology—how do pressure, packing, and a tourniquet stop bleeding?
- Create a course that could be tailored with inserts

"We went from version 2 of the STOP THE BLEED course with more than 400 independent English words to fewer than 60 in version 3," Dr. Inaba said. The ACS commissioned an award-winning medical illustrator, who has produced design work for the Smithsonian and other notable institutions, to help develop the images in the new version.

"We took the time to design different things that would apply to injuries that would occur not just here in Chicago, but in Ukraine, Tokyo, and all around the world," explained Dr. Inaba, noting that the STOP THE BLEED course is now available in more than 150 countries. "We're hoping that this pictures-over-words method of teaching will make it much easier for us to export this globally."

The second guiding principle—provide users with a brief anatomy lesson—involved adapting course FAQs into pictorial representations. "We can use these pictures to explain an injury to the abdomen or the thoracic cage or a junctional injury…and how those could be dealt with. We really wanted to use pictures to go over the physiology so that we know why we're doing what we're doing," Dr. Inaba said.

Create customizable PowerPoint presentations—the third guiding principle—gives instructors the flexibility to develop a presentation that is applicable to specific geographic locations or practice types.

A key component of the version 3 rollout this fall is a revitalized branding strategy, featuring a new STOP THE BLEED logo.

"I would suspect that virtually everybody in this room has received communication from

other competitors in the bleeding control space. And it is really important to distinguish ourselves from these other organizations… to highlight all of the work that's been done," Dr. Inaba said, noting that the finalized logo will be available in different colors and patterns.

Two STOP THE BLEED initiatives in development this summer include integrating the instructor slides into a main course that will replace the separate instructor module.

In addition, developing requirements for participation in the ACS Safe Communities and ACS Safe Organizations initiatives will help support equipment access, prevention efforts, as well as teaching and maintenance of competency.

Advocacy in Action

"We are accelerating our progress with meaningful state action for placement of bleeding control kits in schools and public spaces," said John Armstrong, MD, FACS, Chair of the COT Advocacy Pillar. A total of 14 states have passed bleeding control legislation since this initiative started 4 years ago. These laws outlined mandates to train school nurses and staff (Arkansas); require kits in new construction (California); establish a donation pool to purchase kits for a public safety agency (Indiana); purchase kits in state-owned buildings (New Hampshire); and more.

Dr. Armstrong highlighted the most recent legislative victory that occurred in March in the state of Washington with the passage of S.B. 5790, which will provide bleeding control kits in schools and support the training of bystanders.

"As our colleagues in Washington State know, the line for successful advocacy is often not linear," he said. "It often has many twists and curves, some of which occurred earlier this week. And thanks to quick action by our colleagues in Washington with our manager of state affairs and SurgeonsVoice, the message to overwhelm what was becoming a potential defeat occurred from well over 100 surgeons in the state of Washington."

In order to achieve support by the ACS, all proposed state legislation should include requirements for placing the kits in public places, specifications outlining kit contents, requirements related to kit use and maintenance, and immunity from civil liability.

At the federal level, there are two bleeding control bills: S. 2644: The American Law Enforcement Sustaining Aid and Vital Emergency Resources (SAVER) Act, which permits the purchase of kits and supplies from an existing US Department of Justice grant fund; and S. 1653 Prevent BLEEDing Act, which establishes bleeding control kits through the Office of the Assistant Secretary for Preparedness and Response within the US Department of Health and Human Services.

"What we have learned in Washington is there's likely no new money [to support STOP THE BLEED expansion], but we can suggest repurposing existing funds," explained Dr. Armstrong.

"I see STOP THE BLEED as a conversation starter with decision makers across our communities, local, state, and national," said Dr. Armstrong at the conclusion of his presentation. "The way to succeed is to collaborate with state chapters, medical associations, and hospitals and to demonstrate STOP THE BLEED with our elected officials."

STOP THE BLEED Champions

"'We Are the Champions' and 'Don't Stop Me Now' are two of the greatest songs by Queen," said trauma surgeon David S. Shapiro, MD, FACS, Organization STOP THE BLEED Project Lead. "If we are the champions, then we have to do the work to empower, inform, and educate others about the STOP THE BLEED program." He specifically called on COT state chairs and vice-chairs to take accountability for promoting local awareness of the initiative and to recruit, teach, and retain course instructors.

"What we have to do as the chairs and vice-chairs is make sure that the course is being taught properly with the new version," said Dr. Shapiro. "There will be some changes that are coming. The course is still providing the same information, but it's conveyed in a different way—and we have to make sure we're doing that together."

He also urged members of the COT to collaborate with other organizations that conduct STOP THE BLEED courses—such as the National Emergency Medical Services Information System, Society of Trauma Nurses,

Dr. Lenworth Jacobs (center)—joined by Jimm Dodd, Dr. Kenji Inaba, Dr. John Armstrong, and Dr. David Shapiro (left to right)—was honored for his contributions as Program Director of the STOP THE BLEED program.

Emergency Nurses Association—to make sure there is alignment regarding how version 3 is taught.

"Once you get the new version, read it thoroughly," suggested Dr. Shapiro. "Make sure folks understand it. Collaboration is important, not just across COT pillars but across organizations."

Honoring Dr. Jacobs

Lenworth M. Jacobs Jr., MD, MPH, FACS, who brought the STOP THE BLEED program to the ACS, underscored the value of credible data to achieve ongoing support for the initiative. He cited a 2023 article published by co-panelist Dr. Inaba in the *American Journal of Surgery* that outlines recent trends in mass shootings in the US, describing these events as a "worsening American epidemic of death."

Dr. Jacobs provided a high-level overview of some key program milestones that led to the successful implementation of the STOP THE BLEED program, including:

- Defining a clear vision
- Engaging multiple partners
- Obtaining a national directive
- Engaging public and multiple agencies for support
- Implementing bleeding control training
- Engaging in ongoing advocacy for national and international dissemination

In acknowledgment of Dr. Jacobs's contributions as Program Director of the STOP THE BLEED program—a role that concludes in May—he was presented with a commemorative shadow box featuring the following inscription: "Thank you for all you have done and all you continue to do on behalf of injured patients worldwide. Your visionary leadership has made the STOP THE BLEED program the overwhelming success that it is today." B

Tony Peregrin *is the Managing Editor of Special Projects in the ACS Division of Integrated Communications in Chicago, IL.*

ACS Statement Guides Surgeons in Telehealth Practices

TELEHEALTH IS AN INTEGRAL COMPONENT of modern surgical practice, and through the new "Statement on the Importance and Standards of Telehealth in Surgical Practice," the ACS acknowledges the transformative potential of this technology.

During its February meeting, the ACS Board of Regents approved the statement, prepared by the Board of Governors Telehealth & Informatics Workgroup, which details the importance of telehealth in surgical practice and establishes standards for its optimal use to benefit patients.

The statement called telehealth a "transformative tool in healthcare," while also emphasizing potential benefits of incorporating telehealth into surgical practice, including enhancing access, efficiency and convenience, patient-centered care, multidisciplinary collaboration, and cost efficiency.

According to the new statement, the ACS promotes the use of telehealth "only when it can provide the equal level of care as an in-person visit or when it is used as an adjunct to improve the overall care of the surgical patient," such as for consultations, preoperative assessments, and follow-up and monitoring.

The statement also offers best practices for surgeons using telehealth.

In addition, the ACS released a primer, "Unlocking the Potential of Telehealth in Surgery," that was developed by the workgroup. The primer is a comprehensive guide to help ensure ethical and effective use of telehealth.

The full statement and primer are available at *facs.org/statements.* B

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JACS JOURNAL OF THE AMERICAN COLLEGE OF SURGEONS

Highlights

The following articles appear in the April 2024 issue of the *Journal of the American College of Surgeons*. A complimentary online subscription to *JACS* is a benefit of ACS membership. See more articles at *facs.org/jacs*.

Impact of Prehospital Exsanguinating Airway-Breathing-Circulation Resuscitation Sequence on Patients with Severe Hemorrhage

Joseph Ritondale, BS, Mark Piehl, MD, Sydney Caputo, BS, and colleagues

Early prioritization of hemorrhage control and resuscitation with blood products after penetrating injury improves patient physiology and may prevent the need for immediate advance airway management. This is the first analysis to demonstrate a prehospital survival benefit from exsanguinating hemorrhage control airway-breathing-circulation in a subset of patients with severe injury and hemorrhagic shock.

Operating Room Supply Cost and Value of Care after Implementing a Sustainable Quality Intervention

Amanda C. Filiberto, MD, Tyler J. Loftus, MD, FACS, Cristina J. Crippen, RN, and colleagues

Surgical care accounts for nearly one-third of all US healthcare expenditures, with operating room (OR) costs constituting the second-most expensive part of surgical care after room and board. An automated, sustainable quality improvement intervention was implemented for 16 commonly performed procedures, including laparoscopic cholecystectomy, kidney transplant, and pediatric laparoscopic appendectomy. The authors found a decrease in OR supply cost and increased value of care, while patient outcomes were unchanged.

Home Is Not Always Where the Sleep Is: Effect of Home Call on Sleep, Burnout, and Surgeon Well-Being

Jamie J. Coleman, MD, FACS, Caitlin K. Robinson, MA, William von Hippel, PhD, and colleagues

Home call is commonly practiced across all surgical specialties. Over a 6-month study period, 171 acute care surgeons took 3,313 nights of home call, resulting in sleep disruption and increased feelings of burnout—even on nights during which the surgeon was never called. The authors write that the intensity and impact of home call should be taken into consideration when decisions are made both locally and nationally regarding call schedules and workforce needs.

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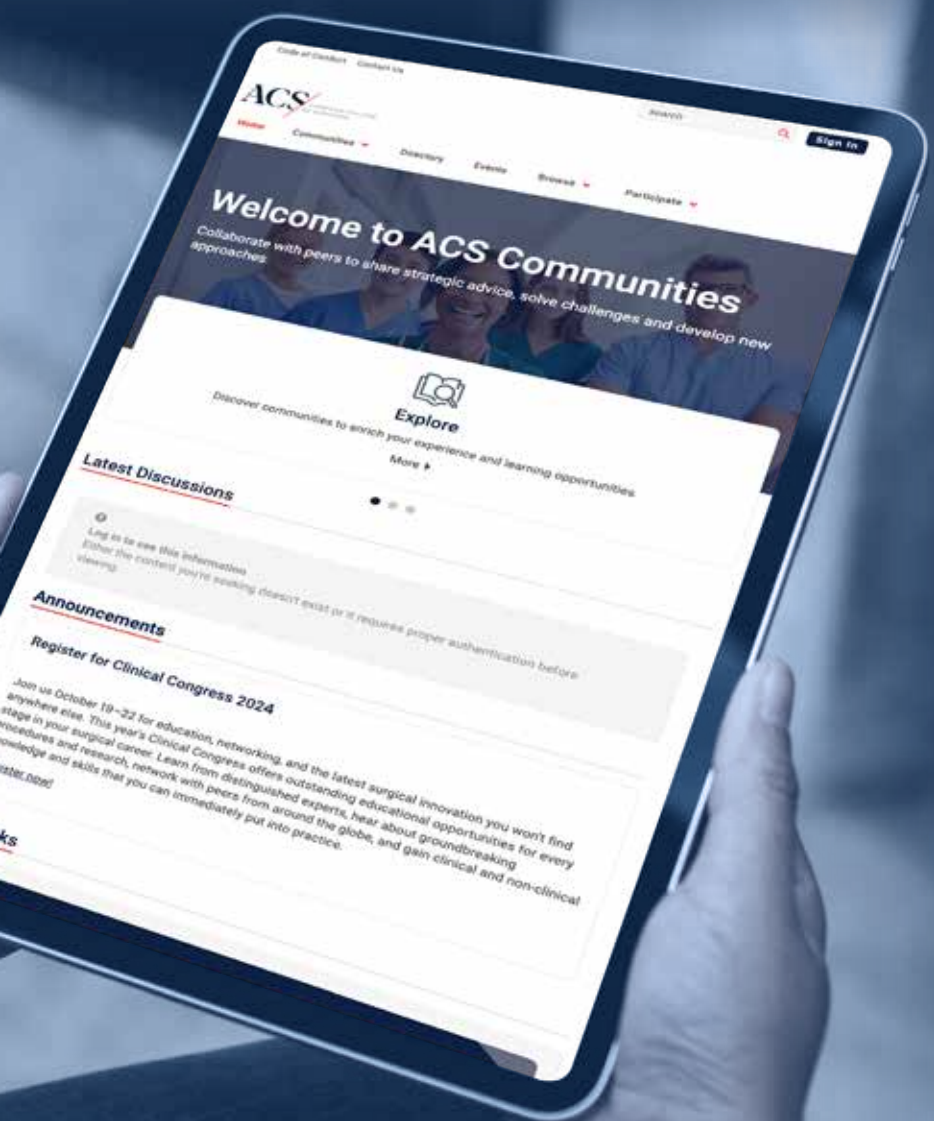

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ACS AMERICAN COLLEGE OF SURGEONS

Engineering Surgical Innovation Is a Joint Effort

Tony Peregrin

A collaborative gathering of surgeons and engineers met last month at ACS Headquarters in Chicago, Illinois, to discuss the development and use of leading-edge simulation technology with the goal of enhancing surgical education and, ultimately, patient care.

Opposite:
Attendees try out one of the simulation models presented at the Surgeons and Engineers meeting.

This page:
Ritika Pansare, from the Michigan Medicine 3D & Innovations Lab in Ann Arbor, won first place in the DIY simulator/model competition with her "Low-Cost Oocyte Retrieval Simulator."

NOW IN ITS FIFTH YEAR, the 2024 Annual Surgeons and Engineers: A Dialogue on Surgical Simulation meeting drew more than 100 clinicians, engineers/scientists, educators, and others in an effort to spark innovation and build connections within this multidisciplinary community.

"There is a real need for us to get these communities together to move the surgical field forward," said Ajit K. Sachdeva, MD, FACS, FRCSC, Director of the ACS Division of Education, in his opening remarks. "I think innovation will come from both the formal presentations and the informal discussions among the attendees."

Simulator Competition and Panel Enhance Engagement

The DIY simulator/model competition—a new addition to the meeting's programming this year—featured 20 participants who presented self-built simulation models. A panel of three expert judges from the ACS Division of Education's Surgeons and Engineers Committee evaluated each simulator/model, and meeting attendees had the opportunity to vote for their favorite entry.

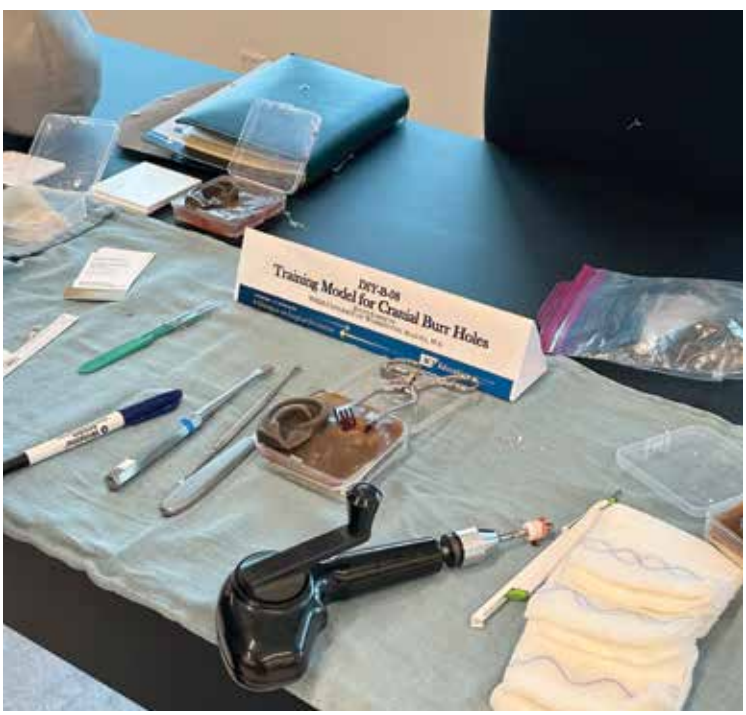
The first-place awardee was Ritika Pansare, from the Michigan Medicine 3D & Innovations Lab in Ann Arbor, for the "Low-Cost Oocyte Retrieval Simulator." Jenny Garnett, from the University of Washington Institute for Simulation in Healthcare in Seattle, received the "People's Choice" award for "Training Model for Cranial Burr Holes."

Dr. Cohen's presentation examined the current culture of innovation and entrepreneurship specifically through the lens of academic medicine and surgery, and provided models for how instructors can enhance the training of medical and surgical innovators in the future.

Another entry in the DIY simulator/model competition—"Training Model for Cranial Burr Holes"—received the "People's Choice" award.

(Competition participants were not required to be surgeons or engineers, and entries from simulator/model companies were not accepted.)

A Special Panel—"How to Build Better Surgical Simulations: Part 2"—functioned as a continuation of a panel presented at the 2023 meeting and featured perspectives of a surgeon educator, an academic engineer, and an industry engineer.



The panelists included John T. Paige, MD, FACS, professor of clinical surgery and director of wound care at Louisiana State University in New Orleans; Ganesh Sankaranarayanan, PhD, associate professor of surgery and biomedical engineering at The University of Texas Southwestern Medical Center in Dallas; and Henry Lin, PhD, a simulation learning architect at Intuitive Surgical.

Moderated by Gladys Fernandez, MD, panelists addressed queries tethered to specific "themes" or issues that emerged during last year's Surgeons and Engineers meeting, including improving surgical education, the importance of standardization, the significance of multiorganizational large-scale validation, and why scoring is both a science and an art.

Creating a Culture of Innovation and Entrepreneurship

The keynote address, "Developing an Ecosystem of Innovation and Entrepreneurship to Advance the Future of Surgery and Academic Medicine," was delivered by Mark S. Cohen, MD, FSSO, FACS, a surgical oncologist and endocrine surgeon. Dr. Cohen also is dean of the Carle Illinois College of Medicine in Urbana—the world's first engineering-based college of medicine, as well as a founding professor of bioengineering in The Grainger School of Engineering at the University of Illinois Urbana-Champaign and senior vice president and chief academic officer for Carle Health in Urbana, Illinois.

Dr. Mark Cohen, from Carle Illinois College of Medicine in Urbana, delivered the keynote address, "Developing an Ecosystem of Innovation and Entrepreneurship to Advance the Future of Surgery and Academic Medicine."

Dr. Cohen's presentation examined the current culture of innovation and entrepreneurship specifically through the lens of academic medicine and surgery, and provided models for how instructors can enhance the training of medical and surgical innovators in the future.

In 2022, Dr. Cohen partnered with the University of Michigan, University of Illinois, and University of Maryland to form the Center for Medical Innovations in Extended Reality (MIXR)—the first US National Science Foundation-funded center for medical innovation and extended reality (XR).

"The goal was to democratize how XR can be used to improve health and lead design development and deployment of these technologies," said Dr. Cohen. XR encompasses virtual reality, augmented reality, and mixed reality.

"But more importantly, our aim was to determine how to train the next generation—to build this workforce through medical XR," he said. MIXR training modules focus on fasciotomy, inhospital cardiac arrest care, intubation, and nursing skills all with the goal of making challenging procedures safer for the patient.

As dean of the Carle Illinois College of Medicine, Dr. Cohen recently has been involved in another landmark educational innovation. At the end of 2023, the institution was selected as the first medical school in the world to integrate an augmented reality-based hologram system for use in its education and clinical programs. With this technology, live ultrasound images are fused with the system's 3D holographic display to guide surgeons as they perform minimally invasive procedures.

To create a culture of innovation and entrepreneurship, according to Dr. Cohen, you need to:

- Understand barriers to the culture
- Pool resources (identify what resources currently exist at your institution and from the US government)
- Develop milestone-based programs to gain additional resources
- Create a curriculum that serves multiple verticals of learners—from students to senior faculty
- Recognize that a return on investment does not always equal money

The call for abstracts opens next month for the 2025 ACS Surgeons and Engineers meeting, which will take place in Chicago on March 19, 2025. Check *facs.org/surg-eng* regularly for updates.

Tony Peregrin *is the Managing Editor of Special Projects in the ACS Division of Integrated Communications in Chicago, IL.*

Dr. Edward (Ted) Copeland, ACS Past-President

A renowned surgeon and international authority on breast cancer, ACS Past-President Edward (Ted) M. Copeland III, MD, FACS, passed away March 31 at the age of 86.

DESCRIBED BY HIS COLLEAGUES as a masterful clinician and quintessential role model for the academic surgeon, Dr. Copeland was a distinguished surgeon, patient care advocate, and leader in the surgical community. Throughout his career, he gained recognition for his contributions to advances in breast cancer surgery and treatment, becoming one of the most prominent breast cancer surgeons in the world.

"Although the passing of Dr. Copeland is a profound loss for both the field of surgery and the University of Florida (UF), I am committed to honoring his memory by making surgical organizations and the UF Department of Surgery the best they can be," said Gilbert R. Upchurch Jr., MD, FACS, the Edward M. Copeland III and Ann & Ira Horowitz Department Chair of the UF Department of Surgery in Gainesville. "After spending countless hours talking with him while he drank his beloved ginger ale, I am saddened because I know there was still more to learn. His passing serves as an important reminder that we, as practicing surgeons, should recommit ourselves to reaching out to older surgeons who still have much to offer. I have tried hard to emulate him as we continue his legacy."

During his 50 years as an ACS Fellow, Dr. Copeland served the College and surgical

profession in a variety of leadership roles, including as ACS President (2006–2007), a member of the Board of Governors (1990–1996), and an ACS Regent (1997–2006). He was the first surgeon from Florida to be elected President of the organization. Dr. Copeland also held more than 40 other positions on several ACS committees throughout the years. In addition, he served in senior leadership positions for other organizations, including the Association for Academic Surgery, Southern Surgical Association, and American Board of Surgery.

Dr. Copeland most recently was the Edward R. Woodward Distinguished Professor of Surgery at the UF College of Medicine in Gainesville, before retiring in 2008 after a 25-year career there.

"More than anything, I'll miss patient contact. My personality is such that I thought I did a good job of helping people through difficult times in their lives," he said at the time.

His UF career began in 1982 as professor and chair of the Department of Surgery. He held these positions until 2003. He also was the first director of the UF Health Shands Cancer Hospital (1994–1999), where he fostered the interdepartmental multidisciplinary collaboration for the delivery of cancer care that is still in place today and helped establish the UF Health Breast Center and its early research and clinical care initiatives. And in 1996, Dr. Copeland was interim dean of the UF College of Medicine—a role that he had said was among his most satisfying experiences.

"Dr. Copeland was invested in people and seeing them succeed, connecting talent with opportunity where he could. In doing so, he was responsible for numerous people's career growth," said Dr. Upchurch.

A native of McDonough, Georgia, Dr. Copeland had an interest in science from an early age, fostered in part by his mother, who was a high school science teacher. His uncle, Murray M. Copeland, MD, an oncologist, also was a guiding presence. As a boy, Dr. Ted Copeland visited his uncle and aunt in Washington, DC, and he was impressed by the unending care and concern Dr. Murray Copeland gave to his patients.

Dr. Copeland went on to pursue a career in medicine, earning his undergraduate degree from Duke University in Durham, North Carolina, and his doctor of medicine degree from Weill Cornell Medicine Medical College in New York, New York. His uncle suggested that he pursue residency training at the University of Pennsylvania (Penn Medicine) in Philadelphia, where Dr. Copeland came under the tutelage of legendary surgeons Jonathan E. Rhoads, MD, DScMed, FACS, and Isidor Schwaner Ravdin, MD, FACS.

At Penn Medicine, Dr. Copeland learned what he considered to be his surgical core values: "honesty; respect for patients, colleagues, and trainees; education of the next generation; adding to the clinical and scientific knowledge base; not having surgical decisions be income driven; and respect for tradition," he shared in his Presidential Address during the Convocation Ceremony at the 2006 ACS Clinical Congress in Chicago, Illinois.

After completing his residency training in general surgery at the Hospital of the University of Pennsylvania, Dr. Copeland served a 2-year tour of duty in the US Army Medical Corps, with assignments in Vietnam and the Office of the Surgeon General. He was awarded a Bronze Star for meritorious service in a combat zone. In 2019, he was elected to the Florida Veterans Hall of Fame.

Dr. Copeland returned to civilian life to undertake an advanced surgical oncology fellowship at MD Anderson Cancer Center in Houston, Texas. He remained there for 10 years, advancing to the position of professor of surgery and becoming a tireless advocate for residents, students, and fellows, a passion that he carried throughout his entire career. Dr. Copeland also was part of the faculty at The University of Texas Health Science Center at Houston McGovern Medical School.

"My legacy is in the people I influenced during their formative years," he said in 2008 when he retired.

In addition to breast cancer, Dr. Copeland's clinical and research foci included surgical nutrition, metabolism, and tumor biology. He published more than 500 journal articles and 85+ abstracts and editorials. Dr. Copeland also was the editor or co-editor of more than 20 books, including *The Breast: Comprehensive Management of Benign and Malignant Disorders,* and was a member of numerous editorial boards.

"We are all forever indebted to Dr. Copeland for not only his contributions to the field of surgery, but also for serving as a shining example of what it is to lead and to do so successfully," said Dr. Upchurch.

Dr. Copeland was preceded in death by his wife of 52 years, Martha Jane Patterson Copeland, who died in 2016. He is survived by their children, Edward M. (Jennifer) Copeland IV, Catherine L. Copeland, and grandchildren Hunter and Zachary Copeland.

Member News

Chang Is Trustee of American Board of Urology

Dr. Sam Chang

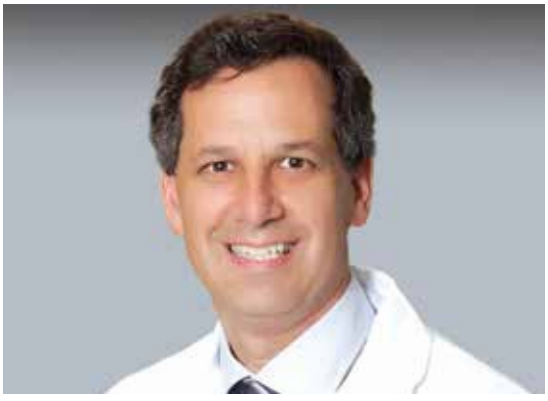
Sam S. Chang, MD, MBA, FACS, was elected trustee of the American Board of Urology, which establishes and maintains standards of certification for urologists. At Vanderbilt University Medical Center in Nashville, Tennessee, Dr. Chang is the Patricia and Rodes Hart Endowed Professor of Urologic Surgery and Oncology, chief of the Division of Urologic Oncology, and professor in the Department of Urology. He also is the chief surgical officer at Vanderbilt-Ingram Cancer Center.

Rectenwald Is Promoted at UW-Madison

Dr. John Rectenwald

John Rectenwald, MD, MS, FACS, was named chair of the Division of Vascular Surgery at the University of Wisconsin (UW)-Madison. He has been a vascular surgery professor at UW-Madison since 2018, and he also is the Susan Behrens MD (Class of 1975) Surgery Education Chair and vice chair of education in the Department of Surgery.

Sands Leads Surgery in Miami



Dr. Laurence Sands

Laurence Sands, MD, MBA, FACS, is the new chair of the DeWitt Daughtry Family Department of Surgery at the University of Miami Miller School of Medicine in Florida. Dr. Sands, chief of the Division of Colon and Rectal Surgery and vice chair of surgical education at the Miller School, has served as the department's interim chair since December 2022. With the Miller School since 1997, he also is a professor in the Division of Colon and Rectal Surgery.

Potter Will Lead Orthopaedic Surgery at Penn Medicine

Dr. Benjamin "Kyle" Potter

Benjamin "Kyle" Potter, MD, FACS, has been named chair of the Department of Orthopaedic Surgery at Penn Medicine in Philadelphia, Pennsylvania, effective June 24. He also will serve as a professor at the Perelman School of Medicine at the University of Pennsylvania in Philadelphia. Previously, Dr. Potter was the Norman M. Rich Professor and Chair of the Department of Surgery at the Uniformed Services University of the Health Sciences in Bethesda, Maryland. He retired in 2023 from the US Army as a Colonel following 22 years of active-duty service.

Have you or an ACS member you know achieved a notable career highlight recently? If so, send potential contributions to Jennifer Bagley, MA, *Bulletin* Editor-in-Chief, at jbagley@facs.org. Submissions will be printed based on content type and available space.

Brasel Will Become VP of ABS

Dr. Karen Brasel

Karen J. Brasel, MD, MPH, FACS, has been named vice president of the American Board of Surgery (ABS). Dr. Brasel is a professor of surgery in the Division of Trauma and Acute Care Surgery, director of the general surgery residency program, vice-chair of education and professional development, and assistant dean for graduate medical education at Oregon Health & Science University (OHSU) in Portland. She will maintain a part-time clinical role at OHSU when she assumes her new position with the ABS on May 1.

Clarke Is AAS President

Dr. Callisia Clarke

Callisia N. Clarke, MD, MS, FACS, is now president of the Association for Academic Surgery (AAS). She is an associate professor and surgical oncologist at the Froedtert Hospital Cancer Center, Medical College of Wisconsin in Milwaukee. At the ACS, she serves on the Committee to Advance Diversity, Inclusion, and Equity, as well as the Cancer Research Program Education Committee.

Varghese Takes Helm at SUS

Dr. Thomas Varghese

Thomas K. Varghese Jr., MD, MS, MBA, FACS, was named president of the Society of University Surgeons (SUS). Dr. Varghese is the associate chief medical quality officer and chief value officer at the Huntsman Cancer Institute, chief of the Section of General Thoracic Surgery at the University of Utah, and professor in the Department of Surgery at the University of Utah School of Medicine, all in Salt Lake City. Dr. Varghese has been an ACS Governor since 2018, and has served on the Best Practices Workgroup, the Quality, Research and Optimal Patient Care Pillar, and on the Nominating Committee.

Emami Is Associate CMO in Georgia

Dr. Claudia Emami

Pediatric surgeon Claudia Emami, MD, MPH, FACS, was named associate chief medical officer (CMO) at Memorial Health in Savannah, Georgia. In this role, she will focus on quality, evidence-based practice, and clinical outcomes. Previously, Dr. Emami was in private practice with Beverly Hills Pediatric Surgery in California and served as section chief for general surgery at Huntington Memorial Hospital in Pasadena, California. B

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