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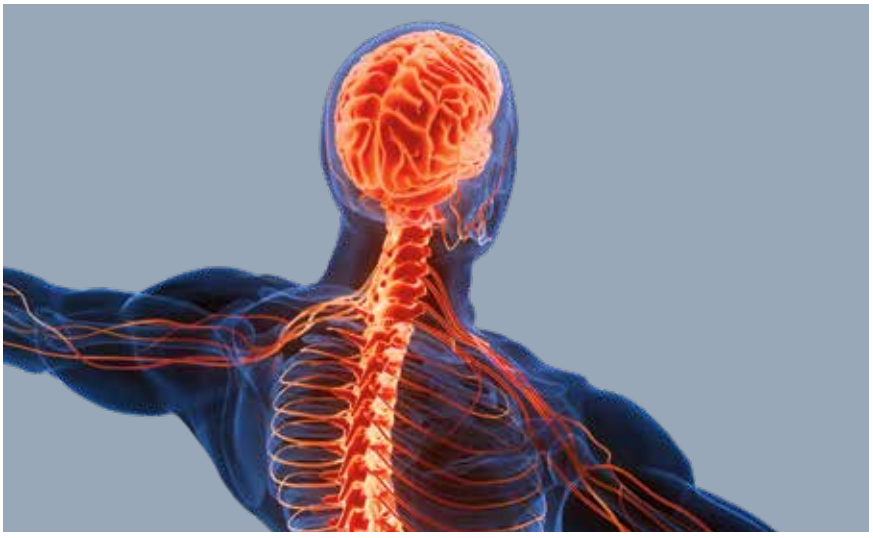

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How the ACS Is Advancing Trauma and Emergency Preparedness Nationwide

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SINCE OUR FOUNDING, the ACS has espoused a broad and bold vision for surgical care.

In 1913, ACS founder Franklin H. Martin, MD, FACS, and his colleagues united to advance the extraordinary goal of ensuring excellence among surgeons and hospitals worldwide. At the time, medicine was just discovering effective antiseptics, many hospitals had only rudimentary infrastructure, and surgical education was inconsistent. Nonetheless, Dr. Martin and his colleagues recognized the possibility of advancing surgical care.

Their impact was impressive. Within a few years, the ACS had connected with surgeons on multiple continents, created some of the earliest quality programs and data registries, and advocated directly to the US President, in addition to establishing our flagship surgical conference, Clinical Congress.

Today, the same ambitious spirit of innovation undergirds how the ACS approaches opportunities to strengthen and transform surgical care. One example is our effort to deliver better trauma care throughout the US by developing a National Trauma and Emergency Preparedness System (NTEPS) and Regional Medical Operations Coordination Centers (RMOCCs).

NTEPS and RMOCCs

During the COVID-19 pandemic, many trauma surgeons, based on their expertise with multi-casualty disasters, began working with medical operations coordination centers (MOCCs). These centers managed surges in patient volume by facilitating coordination across healthcare systems and regions. This helped ensure critical resources and information were distributed efficiently and equitably, and patients received the best care available.

The ACS is now expanding upon this concept with NTEPS and RMOCCs, which would create permanent coordination of trauma care. Each RMOCC would serve as a foundational component of a national system coordinating responses to both daily trauma needs and mass casualty incidents. NTEPS would also strengthen the role of emergency medical services, engage community stakeholders, and implement evidence-based improvement.

Why Is Improved Coordination Necessary?

This plan is bold and necessary.

Our current trauma system is largely fragmented across more than 2,000 trauma centers, with high variability in access, quality, and continuity of care. Few mechanisms connect centers across regions or states. While most trauma teams deliver

exceptional care, many systems and teams operate under strained resources or conditions.

Improved coordination can save lives. MOCCs operating during the pandemic were estimated to reduce mortality by 25%. As COVID-19 showed, these challenges become more consequential when emergencies arise.

Growing concerns about large-scale armed conflict underscore the need to strengthen the current system. Despite the large size of the US healthcare system, if war were to occur domestically or if military forces abroad sustained significant injuries, our existing trauma beds would be quickly overwhelmed. Addressing vulnerabilities requires meaningful improvement before war occurs.

A recent meta-analysis revealed that if optimal trauma care were available to all patients, an estimated 20% of trauma-related deaths could be prevented, saving approximately 40,000 lives per year.

How the ACS Is Involved

The ACS is well-positioned to lead the effort to create NTEPS and RMOCCs because of our longstanding, far-reaching leadership in trauma care.

For more than a century, the ACS has worked to improve trauma care via the Committee on Trauma (COT). We have established a global standard for trauma care through the Advanced Trauma Life Support® course, now in its 11th edition and approaching its 50th anniversary. We have advocated successfully for building US military-civilian partnerships in trauma surgery, including supporting the MISSION ZERO Act.

Most importantly, we know our work saves lives. The ACS Trauma Quality Improvement Program has more than 1,000 participating hospitals, and studies consistently show that patients who receive trauma care at ACS-verified centers have an improved chance of survival and better outcomes when compared to those receiving care at nonverified centers.

What Has Been Achieved Thus Far

In 2022, the ACS COT, then led by Chair **Eileen M. Bulger**, MD, FACS, and Medical Director **Ronald M. Stewart**, MD, FACS, released a blueprint for NTEPS. (The COT updated the document in 2025.)

Over the subsequent 4 years, under the leadership of Chair **Jeffrey D. Kerby**, MD, PhD, FACS, the COT laid further groundwork. They engaged with the National Institute for Defense Health Cooperation (NIDHC), which implemented the federal National Disaster Medical System pilot program to ensure military and civilian health operations readiness during conflict and crisis. These conversations established that, despite substantial progress in military health system preparedness, critical gaps remained in coordination and readiness among civilian hospitals.

As a result, the NIDHC has secured Congressional funding through the National Defense Authorization Act for 15 federally funded, civilian-led RMOCCs in strategic locations nationwide. The ACS will participate in establishing these centers, which will support approximately a third of trauma beds nationwide.

Additionally, the ACS blueprint and grassroots efforts have helped influence the ongoing development of independent RMOCCs in South Texas, rural Kentucky, and elsewhere. The ACS will also support these efforts, which will help realize the vision of NTEPS.

Under the current leadership of Chair **Kristan L. Staudenmayer**, MD, MS, FACS, the COT continues to refine and strengthen this work. Current priorities include addressing the financial sustainability of RMOCCs, ongoing federal advocacy, and strategies for longer-term implementation.

Transformative and Practical

It is undoubtedly ambitious to unite more than 2,000 trauma centers to address the daily demands of trauma care and the potential for a large-scale armed conflict. That said, the pursuit of this goal is practical, evidence-based, and grounded in realism about the capacity of the ACS to address national needs.

In this way, it echoes the insights that motivated Dr. Franklin Martin and his peers so many years ago. Through our ambitious pursuit of excellence, the ACS and its members have the capacity to transform surgical care for the better and truly Heal All with Skill and Trust.

Clinical Congress

Registration is now open for Clinical Congress 2026. Please join us in Washington, DC, September 26–29, for sessions on myriad surgical topics, many of which are urgent, transformative, and within our reach. Learn more at *facs.org/clincon2026*.

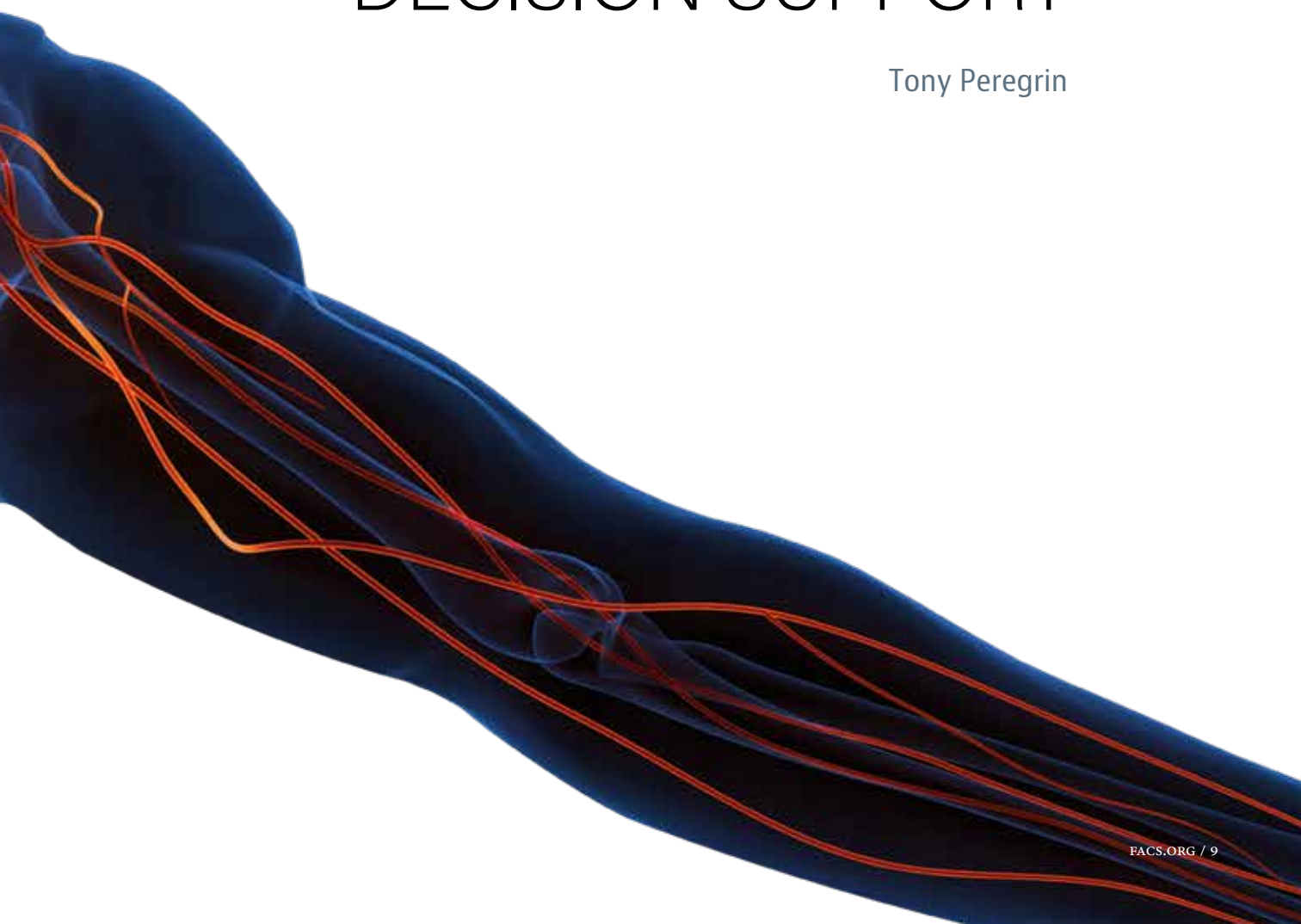
QSCC

This year, our first joint Quality, Safety & Cancer Conference (QSCC) will explore the theme "QI Powered by AI." Join us in Orlando, Florida, July 30–August 2, for sessions on quality, safety, and cancer care. Register today at *facs.org/QSCC26*.

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

AI IS "REWIRING" NEUROSURGERY THROUGH CLINICAL DECISION SUPPORT

Tony Peregrin



Considering the critical need for millimeter-level precision in neurosurgery, where any deviation could result in irreversible consequences, emerging applications of artificial intelligence (AI) may help surgeons optimize and refine accuracy beyond manual capacity.

Access related video content online.

WHILE AI IMPLEMENTATION in neurosurgery is in the early stages of revealing future potential, recent advancements in diagnostic imaging, surgical planning, and intraoperative navigation are enabling clinicians to perform individualized procedures that may improve outcomes. Current literature reviews suggest measured optimism and emphasize the need for more high-quality clinical validation of these advancements.

Personalized AI Guides Spine Treatment Pathways

While the integration of AI into spine surgery has yet to reach transformative levels, its footprint continues to expand rapidly.[1]

Beginning with preoperative planning, AI is transforming what was traditionally a time-consuming, manual process into an automated, high-precision measurement of the shape and structure of vertebrae, discs, and the spinal canal obtained from dual-energy x-ray absorptiometry (DEXA) images and computed tomography (CT) scans.

"AI is being used in the diagnostic workup, which includes the interpretation of imaging studies," said Michael G. Fehlings, MD, PhD, FACS, vice chair of research in the Department of Surgery at the University of Toronto in Canada, and a neurosurgeon at Toronto Western Hospital, University Health Network. "AI algorithms can analyze images for issues such as spine morphometry, alignment, and deformity, and quantify these findings."

These algorithms can provide automated measurements, such as the Cobb angle, which assist surgeons in identifying conditions such as scoliosis, disc degeneration, and stenosis with expert-level precision that can match or exceed human proficiency.[2]

"Another area where AI is starting to be used is in the assessment of the heterogeneity of patients and personalizing the management of the patient," added Dr. Fehlings.

In spine care, heterogeneity describes the unintentional variation in patient selection regarding treatment and surgical approaches, which can complicate standardization and decision-making.

To help mitigate variations in care, researchers at the Cleveland Clinic Center for Spine Health in Ohio designed an AI platform that analyzes a comprehensive set of patient data, including lab results and imaging, from more than 55,000 surgeries performed between 2007 and 2022.[3]

In a study of 3,000 patients who underwent lumbar laminectomy at the Cleveland Clinic, more than half achieved meaningful clinical improvement. Modeling suggested the success rate could exceed 75% with AI-guided decision-making and potential cost savings of up to $25,000 per case.[4]

By using AI to individualize care planning, clinicians can reduce clinical heterogeneity and improve patient outcomes.

AI-Driven Intraoperative Guidance

"In terms of the surgery itself, AI is currently being coupled with a few technologies, including robotics, which is really in its infancy in the area of spine surgery," explained Dr. Fehlings. "The main use of robotics right now is to assist with the placement of implants such as pedicle screws, although currently less than 5% of pedicle screws in North America are placed with robotics."

Composed of titanium or cobalt chrome, pedicle screws are used in spinal fusion surgery and function as internal stabilizers while vertebrae heal. Connected by fusion rods to prevent movement, these implants help maintain alignment and typically serve as a treatment pathway for various spinal disorders.

By analyzing patient data and automating specific steps, robotic-assisted screw placement uses AI to improve preoperative planning and optimize real-time navigation that may not be available via approaches that rely solely on manual, freehand, or fluoroscopy-guided techniques.

Traditional screw placement methods have been shown to result in misplacement rates ranging from 30% in the lumbar spine to 55% in the thoracic spine, while at least one study demonstrated a 90% success rate with robotic-assisted pedicle screw placement.[5]

However, while robotic-assisted screw placement offers elevated precision, intraoperative conversion to manual techniques occurs in 7% to 17% of cases examining novice adopters of this technology.[6]

"More research is required to validate the use of robotically assisted screw placement," cautioned Dr. Fehlings. "Right now, this is an emerging technology, and one that has not been validated with multiple, high-quality prospective research studies. Currently, there is a lot of focus on technology development, rather than conducting rigorous studies that examine clinical outcomes."

AI technology also has a role in creating personalized fusion rods that connect the pedicle screws by analyzing CT and magnetic resonance imaging scans to generate 3D-modeled, customized hardware that aligns with a specific patient's bone anatomy.

"Currently, the surgeon will take a straight rod and using their eyes, hands, and skills will bend the rod to match the alignment of the spine," said Dr. Fehlings. "When the surgeon bends the rods intraoperatively, there is potential to weaken the rod during the bending, so it might be more susceptible to breakage. AI-generated, pre-bent rods could reduce revision rates and reduce the time that's spent in surgery."

Another AI-driven enhancement to spine surgery is augmented reality (AR), which overlays patient-specific anatomical data onto the surgical field. AR in this context is intended to enhance tasks, including improving pedicle screw placement accuracy and reducing exposure to radiation.

In a review of studies published between January 2004 and May 2025, AR-assisted pedicle screw placement accuracy rates ranged from 93% to 100% with a reduction in fluoroscopy time and improved surgeon ergonomics.[7] In the article, researchers noted that broader adoption "remains limited by cost, integration challenges, and a lack of large-scale, multicenter trials," even as this technology

By using AI to individualize care planning, clinicians can reduce clinical heterogeneity and improve patient outcomes.

shows "early promise in enhancing precision and efficacy."

The xvision Spine System is reportedly the first AR guidance system to receive clearance from the US Food and Drug Administration, although several other companies offer AR, mixed reality, or advanced image-guided navigation systems tailored for spine surgery.[8,9] The xvision Spine System allows surgeons to "visualize a patient's 3D spinal anatomy directly on their retina, functioning like 'x-ray vision' to navigate instruments and implants during surgery."[8]

Learning Curve for AI Integration into Spine Surgery

A review of published studies examining the learning curve for surgeons using AI-enabled robotics in spine surgery suggests that 20–30 cases are typically required to attain proficiency, although this number could vary widely depending on a surgeon's skill and case complexity.[10] Proficiency with this approach could include a number of factors such as demonstrated mastery of preoperative planning tools, robotic navigation, and the ability to interpret AI-driven data.

"I do not see AI replacing spine surgeons or neurosurgeons at any time in the near or foreseeable future," said Dr. Fehlings. "Over the next 10–20 years, robotics and AI will become part of our day-to-day life, in terms of how we work up our patients and the way we apply the techniques intraoperatively."

Before this transformation can occur in neurosurgery, clinicians need to cultivate a culture that fully embraces and supports upskilling.

"My advice is that when a wave is coming, it's much better to surf the wave than to fight the wave," said Peter Nakaji, MD, FACS, a surgeon specializing in complex cranial neurosurgery, including cerebrovascular surgery and brain tumor treatment. Dr. Nakaji is the founder of Scottsdale Neurosurgery Specialists in Arizona and executive director of the Bob Bové Neuroscience Institute at HonorHealth Scottsdale Osborn Medical Center.

"My father was a general surgeon, and at one point in his career, he watched the laparoscopic revolution unfold, and as a result, he adapted to be able to stay within the field of surgery. The difference today is that previously, those types of changes happened generationally, one or two times in your entire career, while I've seen maybe three or four big changes during my career. The key here is not simply getting better, but being very good at getting better. Becoming nimble at learning and adapting to new tools is going to be critical," he shared.

AI Support for High-Stakes Neurosurgical Decisions

The use of AI-driven technology in brain surgery (and other specialties) often has been described as a "second pair of eyes," providing surgeons with real-time analysis of the operative field, enabling them to identify tumor margins or anatomical

abnormalities that may be invisible to the human eye.

"When I first started in my career, we really just went in with the scan, we committed the image to our own brain, and we did our best to see the tumor," said Dr. Nakaji. "Some surgeons were really good at seeing the tumor, even where the edge of a tumor just looks like butter melted into margarine. Now, there is a lot more information available to the surgeon. For instance, the image guidance systems can start to detect deformation, and so, even though the scans show one thing, the system can alert you to changes in real time. AI will not be a matter of having another pair of eyes—it's like having a suite of eyes, which is critical, because there are multiple things that the surgeon must keep track of in the OR."

For example, surgeons must take into account what they see through their own eyes and whatever is showing via imaging guidance, but they also could have intraoperative neurophysiological monitoring, which features electrophysiological signal feedback to alert them when they are getting close to a structure. By integrating AI into real-time monitoring, these existing feedback systems may further enhance situational awareness.

"You just can't watch all of the inputs all the time, so we're always flipping our attention back and forth in order to do that," said Dr. Nakaji. "I think AI is going to actually provide you much better

This conceptual illustration depicts an AI-guided neurosurgeon using wired instruments, an exoscope/endomicroscope, and image-guidance technology to move beyond anatomy and operate at the level of neurophysiology.

information than you can get from your own mind because you can't possibly focus on everything at once. The promise of this capability—that it can provide the surgeon with not just a second set of eyes, but with every eye as it monitors every system—that's the compelling piece."

Is AI's Promise Curbed by Data Deficit?

While AI provides neurosurgeons with real-time intraoperative support as an "always on" surveillance partner through immediate guidance prompting, this technology is constrained by the current dearth of high-quality, standardized metadata, which these platforms rely on to provide reliable information. In this context, data refer to the core clinical information used to diagnose and treat a patient, while metadata offer contextual and descriptive information (in other words, data about the data).[11]

"I think getting pre-consent from the patient for the AI to capture metadata would be an important step because AI is only as good as the data it is trained on," said Dr. Nakaji. "Metadata could describe how a procedure actually went, including the surgeon's impression of the procedure, and everyone would share that data. Right now, those of us in academic or institute models often participate in sharing this information, but this is not the case in community settings largely due to HIPAA regulations."

If data sharing were amplified, surgeons would conceivably benefit from the experiences of every other surgeon that has used the system, including lessons learned from missteps.

"Recently, I spent all day taking out a giant acoustic neuroma from somebody's skull base," he said. "There are three approaches to that tumor, and in fact, there are even more sub-approaches within those techniques. However, surgeons often specialize in only one or two techniques that they are most comfortable with, sometimes in preference to other valid options."

Surgeons should be open to all relevant approaches with the goal of providing customized surgical care to each individual patient.

"We talk about standardization, for example in joint replacement surgery, and for those cases, the more standardized, probably the better," added Dr. Nakaji. "But for brain surgery, you cannot do the same thing every time. The question of how to customize these cases is driven by experience—and not everyone can have the necessary experience. But you can use the AI to help you to function like you have it."

The amount of training necessary to become proficient in AI-augmented brain surgery, with neurosurgeons employing robotic-assisted or virtual reality technology, for example, is difficult to ascertain at this point for many reasons, including high variability in how quickly clinicians master these associated skills.

"We haven't determined the learning curve for this, but I can tell you that while surgeons mostly learn on their feet

If data sharing were amplified, surgeons would conceivably benefit from the experiences of every other surgeon that has used the system, including lessons learned from missteps.

in the OR, I don't think this will continue in the future because there will be simulation models similar to what airplane pilots use during their training," said Dr. Nakaji. "With AI simulation, the system will watch the trainee and say, 'You're not getting this part, and I think I see why.' Or 'You don't know the anatomy well enough,' or 'There's a basic hand-eye coordination issue,' and then the trainee would work to improve on these issues. We can't afford the cost to have a top surgeon coach you every day, but AI could get you at least part of the way."

By providing real-life, complex operative scenarios in a risk-free setting, AI-enhanced simulation may help improve skill acquisition and accuracy.

"I think there's a beautiful new era of surgery coming where these systems will be in place and surgeons will be much better equipped. They'll be like Iron Man," said Dr. Nakaji, referring to the comic book superhero whose suit of armor provides enhanced capabilities. "The surgeon will feel like they're in an environment that gives them superpowers." B

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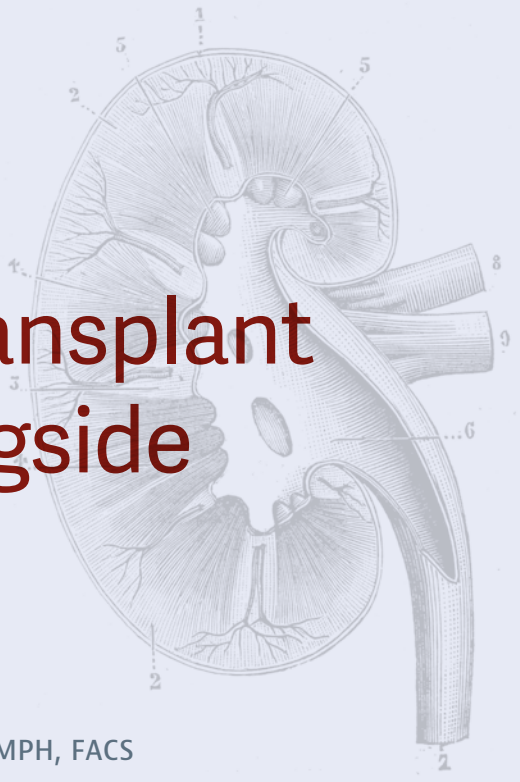
Robotic Kidney Transplant Is Expanding Alongside Growing Evidence



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KIDNEY TRANSPLANTATION is the gold standard treatment for patients with end-stage renal disease, offering improved survival rates and quality of life compared with dialysis.

Despite major advances in immunosuppression, organ preservation, and allocation, the surgical approach to open kidney transplantation (OKT) has changed little since it was first performed by Nobel laureate Joseph E. Murray, MD, in 1954. However, rapid progress in minimally invasive surgery has positioned robotic kidney transplantation (RKT) at the forefront of transplant surgery innovation. An increasing body of evidence suggests that RKT offers advantages for patients, surgeons, and healthcare systems.

RKT achieves equivalent graft function and patient survival rates compared with OKT while demonstrating a more favorable perioperative profile. Data from a cohort-matched study from Washington University in St. Louis (Missouri) demonstrated similar graft function and patient survival between RKT and OKT, but with significantly lower rates of all complications (14% versus 31%), a 50% reduction in readmission (14% versus 31%), lower return to the OR (2% versus 15%), postoperative lymphocele (6% versus 25%), and reduced postoperative opioid requirements (65 versus 93 morphine milligram equivalents).[1]

A propensity-matched study conducted by researchers at Henry Ford Hospital in Detroit, Michigan, demonstrated similar graft function and survival between RKT and OKT, but with a 6-fold reduction (4% versus 24%) in the Clavien-Dindo classification greater than or equal to three complications for the RKT group.[2] Another cohort-matched study conducted at the University of Illinois Chicago demonstrated similar graft function and patient survival, as well as a significant reduction in surgical site infections in RKT versus OKT patients (0% versus 28%).[3]

National data from more than 140,000 patients further support lower rates of complications,

The robotic kidney transplant is an approach that is gaining wider adoption as evidence supporting its safety and effectiveness continues to grow.

The robotic platform aligns well with the technical demands associated with kidney implantation.

surgical site infections, and in-hospital mortality among RKT recipients.[4] These findings are consistent with European studies demonstrating excellent long-term graft outcomes.[5,6]

The robotic platform aligns well with the technical demands associated with kidney implantation, including precise vascular anastomoses and careful graft handling within a limited ischemic window. A muscle-sparing approach may facilitate earlier mobilization and reduce wound complications such as incisional hernias.

The RKT procedure was initially developed to address disparities in accessing transplant care among patients with obesity. Since RKT was first performed in 2010,[7] multiple studies have demonstrated improved access and outcomes in the obese population.[8]

Notably, body mass index (BMI) thresholds remain a barrier at many centers with approximately 73% of US transplant programs enforcing a cutoff of 40 kg/m^2 at referral or waitlisting.[9,10] A recent US study showed nearly 40,000 (N=39,844) incident dialysis patients had obesity as their only demonstrable contraindication to transplant listing; these patients tended to be younger, female, and Black.

Compared to patients with a BMI of less than 35, patients with higher BMI were significantly less likely to be waitlisted, and even after waitlisting, they remained less likely to undergo transplantation.[11]

Researchers at the University of Colorado Anschutz in Denver published a study highlighting the potential to increase equitable access to transplant care. Although three-quarters of their RKT recipients had a BMI less than or equal to 30, the program's robotic expansion appeared to increase transplant access for patients with a BMI greater than or equal to 40.[12]

Institutional and Surgeon-Level Advantages

From an institutional perspective, removing BMI barriers from waitlisting decisions allows centers to expand access to care for patients and provide more patients with lifesaving kidney transplants.

RKT may improve value by reducing complications, readmissions, and length of stay, all of which contribute to downstream cost savings. Perioperative departments improve efficiency and return on investment by scheduling robotic surgeries during nonpeak hours. Additionally, RKT programs can enhance referral networks and serve as a differentiator for transplant center growth and patient recruitment.

In the University of Colorado study, RKT recipients came from a wider referral geography than OKT recipients,[12] and these data suggest that patients seek out specialized RKT programs for high-risk transplants.

For surgeons, robotic platforms offer ergonomic benefits, as well as improved high-magnification visualization and enhanced wristed-instrument dexterity, which may facilitate more consistent and precise vascular reconstruction.

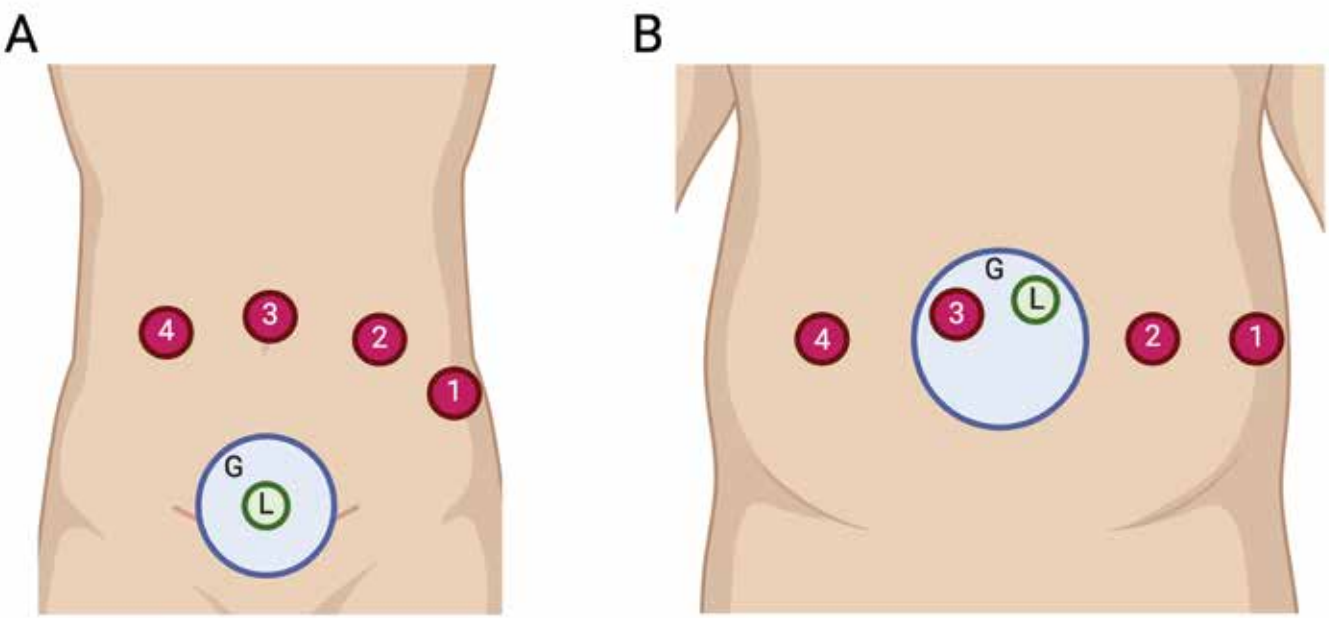
Kidney implantation is a structured, common, and reproducible operation that demands careful iliac dissection, precise vascular suturing, deliberate graft orientation, gentle ureteral handling, and reliable performance during a short ischemic window. These features may be particularly advantageous in complex cases, including those with multiple renal arteries, atherosclerotic/calcified recipient vessels, and reoperative kidney transplantation. For surgeons interested in the technical aspects of RKT, a narrated operative video is available (scan QR code on page 22).

Limitations of Current Evidence

Despite encouraging outcomes, most available data are retrospective and subject to selection bias. RKT cohorts remain smaller and are concentrated at high-volume centers, which may limit generalizability.

RKT is unique because it is one of the few minimally invasive abdominopelvic operations that do not have a direct laparoscopic comparator for outcomes and cost-effectiveness, making OKT the primary benchmark for outcomes and value comparisons.

Long-term graft outcomes, broader cost-effectiveness, and dissemination across diverse practice settings warrant further comprehensive study. Ongoing prospective evaluation, including the European ORKTx prospective, randomized control trial, is expected to provide higher-level evidence.[13]



This illustration shows port placement configurations used during RKT procedures, including access points for robotic instruments, graft introduction, and laparoscopic assistance.

A group of surgeons recently attended robotic donor nephrectomy training.

Turning Barriers into Speed Bumps

With 27,573 kidney transplants performed in the US in 2025, this case volume represents the potential to scale up RKT to improve patient care.[14] In the 15 years since the first RKT, the procedure has been further refined and greatly expanded. However, widespread adoption of RKT faces several barriers.

Challenges such as intraoperative costs related to robotic platforms, expensive disposable instruments, and team training remain significant. However, analyses focusing solely on operative costs may underestimate the broader economic impact, particularly when considering reduced complications and readmissions. Preliminary, unpublished data from Washington University in St. Louis suggest that average index hospitalization cost, including intra- and perioperative expenses, are comparable between RKT and OKT.

Cost methodologies that place heavy emphasis on RKT operating room expenses often fail to capture the broader picture in transplantation. These factors include prolonged dialysis treatment and exposure, center waitlist management, costs associated with post-transplant morbidities and readmissions, and in the case of high BMI patients, potential exclusion from lifesaving transplantation opportunities.

Alignment of reimbursement with value will be critical for broader adoption. Currently, RKT is reimbursed using the same Healthcare Common Procedure Coding System (HCPCS) code (50360) as OKT. This process is unlike other pelvic operations where a separate higher-reimbursing minimally invasive surgery (MIS) code exists, including MIS prostatectomy (1.47x relative value units [RVUs] versus open), MIS hysterectomy (1.44x RVUs versus open), and MIS proctectomy (1.25x RVU versus open).[15] As the benefits of RKT are recognized by payers, a new HCPCS code for minimally invasive kidney transplantation is expected to be established, with reimbursement commensurate with patient benefit.

Operational Challenges

The integration of transplantation into robotic OR workflows presents some process-related barriers, particularly for deceased donor cases that occur unpredictably and do not easily fit into a traditional OR block time-based scheduling model. For living donation, which is easily scheduled in the elective OR block time, this is less of an issue.

Counseling patients receiving deceased donor organs—which account for the vast

With 27,573 kidney transplants performed in the US in 2025, this case volume represents the potential to scale up RKT to improve patient care.

majority of US transplant volume—on the benefits of RKT requires institutional commitment to adequately support the RKT program.

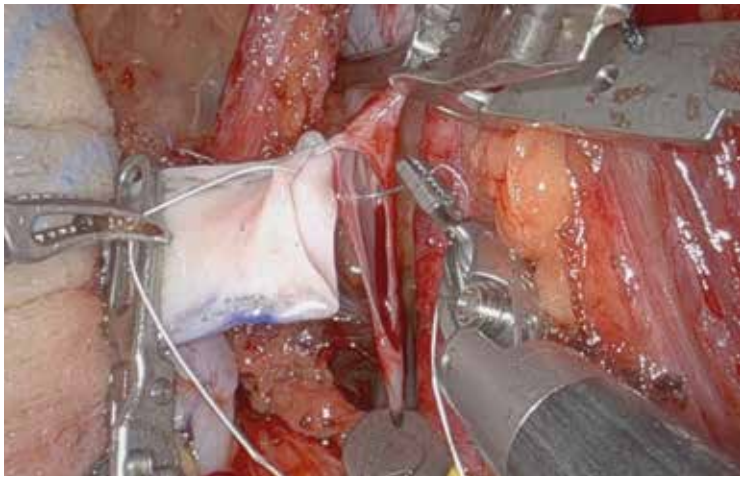
Developing an around-the-clock, on-call robotics team for transplant and emergency general surgery has been successfully executed in several academic medical centers.[16,17] However, this approach requires institutional and perioperative leadership buy-in to provide the benefits of robotic surgery to patients for urgent add-on cases.

Building an RKT surgeon workforce is both a challenge and an opportunity.

Formal robotic curricula are beginning to emerge, and recent reports suggest that RKT can be taught within a structured framework.[18] For experienced surgeons, competence may be achievable after a modest number of cases, and it is possible for dedicated OR teams to accelerate program growth and fellow training.

A recent survey of American Society of Transplant Surgeons fellows and program directors revealed 73% of fellows expected exposure to 50 or fewer robotics cases during fellowship, 94% wanted more robotics experience, and 35% reported dissatisfaction with their robotics training. Most fellows viewed robotics as important or essential to future transplant practice, and many believed this technology would shape future employment opportunities.[19]

RKT will not expand in a responsible manner if training remains informal, inconsistent, or concentrated in a handful of highly specialized centers.



Robotic-assisted venous anastomosis is performed during kidney transplantation using minimally invasive surgical instruments and high-definition visualization.

RKT is rapidly gaining momentum in the field, and this innovative minimally invasive technique is at the frontier of transplant surgery.

Access related video content online.

Programs need reproducible pathways for case selection, team setup, back-table planning, graft introduction, vascular and ureteral anastomosis, intracorporal organ cooling, troubleshooting, and graduated case complexity.

Successful Implementation

RKT is unlikely to replace open transplantation in the near term. However, the accumulating evidence suggests that it should be seriously considered by transplant programs seeking to improve outcomes and expand access.

Successful implementation will depend on a deliberate, systems-based approach: building multidisciplinary teams, standardizing techniques, selecting appropriate cases, and rigorously monitoring outcomes.

The collaborative nature of the RKT community, including team mentorship, shared technical resources, and institutional partnerships, has facilitated responsible growth and will remain essential moving forward to maintain strict safety standards. Experienced RKT programs and surgical mentors have been sharing intraoperative videos of technical challenges, hosting surgeons and their OR teams for on-site observation, and providing mentorship and coaching as new centers begin building their own programs.

RKT is rapidly gaining momentum in the field, and this innovative minimally invasive technique is at the frontier of transplant surgery. There is an increasing body of published literature demonstrating favorable patient outcomes with RKT, which raises a compelling case for an expansion of this approach.

As adoption increases, the central questions are no longer whether RKT should be implemented, but rather where it provides the greatest value, which patients benefit the most from this procedure, and how programs can integrate this technology safely and effectively into clinical practice. B

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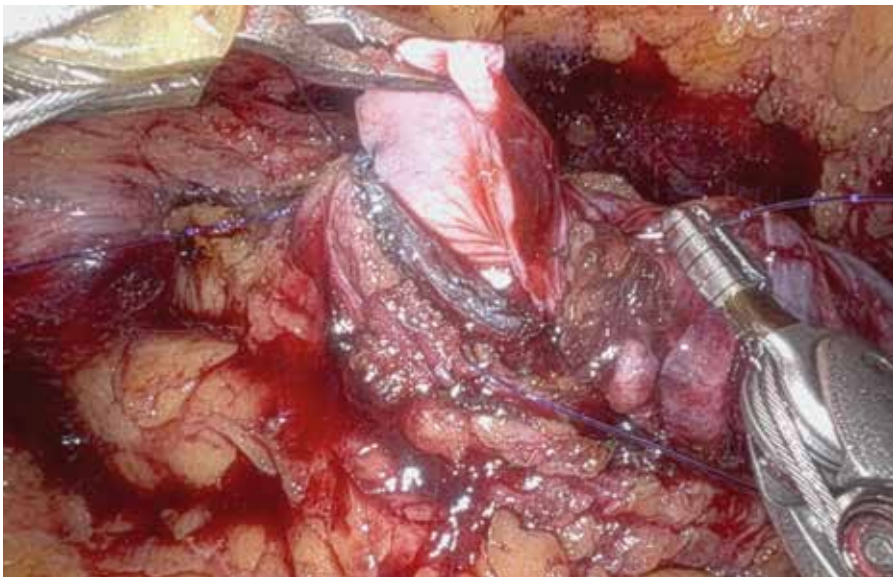

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Mobile Screening Drives Expanded Breast Cancer Care in Mongolia

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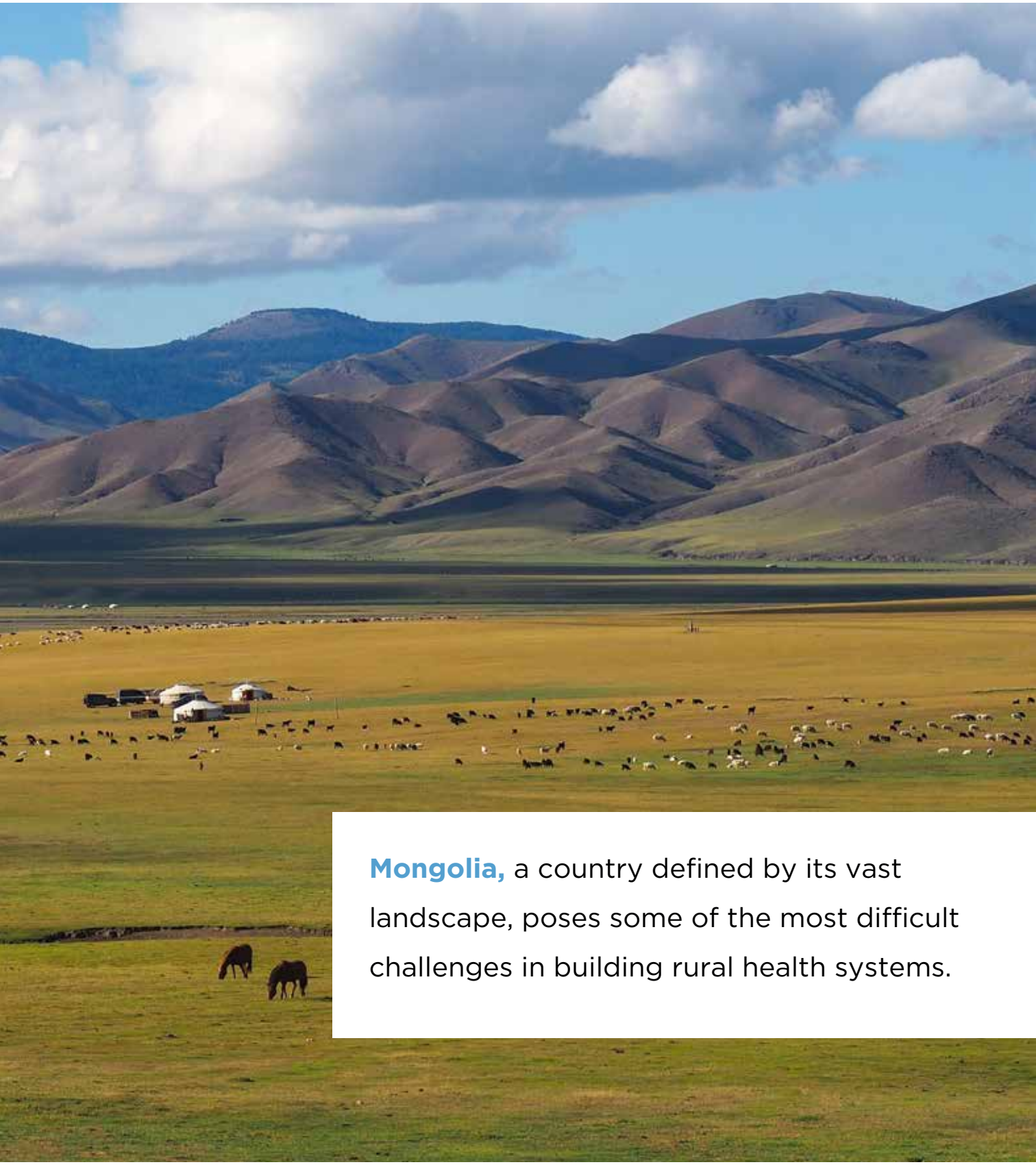


Mongolia, a country defined by its vast landscape, poses some of the most difficult challenges in building rural health systems.

OVERLAID ON A MAP OF THE US, at its widest point, Mongolia would stretch from California to Texas, yet it is home to fewer than 3.5 million people. Nearly half of the population resides in the capital Ulaanbaatar, where the country's hospitals, specialists, and diagnostic infrastructure are concentrated.

The rest of the country's population is dispersed across a vast interior of steppe (grassy plain), desert, and mountain range, with an estimated 30% to 40% of these individuals living nomadic or seminomadic lifestyles.[1,2] For many of these individuals, access to healthcare requires hours of travel, and in some cases, days to reach the nearest healthcare provider.

In high-income countries, breast cancer systems have been built over the course of decades, supported by organized screening programs, established referral pathways, and integrated multidisciplinary teams. Bridging this standard of care in Mongolia, however, requires navigating complex geographical barriers in addition to clinical hurdles, especially when considering the care of patients with breast cancer. Breast cancer is a disease process that depends heavily on early detection and coordinated multidisciplinary management.

Between 2014 and 2019, 57% of women diagnosed with breast cancer at the National Cancer Center of Mongolia (NCCM) presented with stage III or stage IV disease, and of these, up to 88% died within 5 years.[3] In contrast, data from high-income countries show that approximately 10%–20% of patients present with advanced-stage disease.[4]

The Utah and Minnesota breast team stands in front of traditional Mongolian yurts (also known as gers).

These findings reflect not only the burden of disease, but the consequences of limited access to early detection and the difficulty of treating late-stage breast cancer. Since 1961, the NCCM has provided reliable oncologic care to patients who are able to make the journey to the center, but when the majority of patients present after the disease has advanced beyond the point of early intervention, systematic change is required in order to expand access to care.[3]

Building the Foundation for Breast Cancer Care

Recognizing the need to create a specialized breast cancer team to address the high mortality rate, the NCCM, supported by Batsukh Pushkin, MD, MPH, established the country's first breast center in 2020 in collaboration with Mongolian stakeholders and international partners, including Raymond R. Price, MD, FACS, Kirstyn E. Brownson, MD, and Todd M. Tuttle, MD, MS, FACS. A central focus of this work has been the development of systems that support coordinated, multidisciplinary care, which previously did not exist for breast cancer care in Mongolia.

Due to the constraints of COVID-19 that prevented in-person collaboration, in 2021, a virtual tumor board was established in partnership with specialists from the NCCM, The University of Utah in Salt Lake City, and the University of Minnesota in Minneapolis. This initiative created a consistent forum for case-based discussions across surgical oncology, radiology, pathology, radiation oncology, and medical oncology, introducing a level of structured decision-making that led to the NCCM formalizing its first dedicated multidisciplinary breast cancer team.[3]

These developments established a foundation for more consistent, comprehensive treatment planning. The tumor board functioned as the central mechanism through which this coordination was operationalized, embedding case-based, guideline-informed decision-making into routine care.

Over time, this platform facilitated increased initiation of chemotherapy in the neoadjuvant setting, adoption of breast-conserving approaches, and the integration of sentinel lymph node biopsy into surgical practice.

A central focus of this work has been the development of systems that support coordinated, multidisciplinary care, which previously did not exist for breast cancer care in Mongolia.

Nomadic Mongolian women wait in line to get screened for breast cancer.

At the NCCM, these changes coincided with measurable shifts in care patterns. For example, between 2021 and 2025, the mastectomy rate declined from 94% to 37%, alongside a reduction in axillary lymph node dissection following the introduction of sentinel node techniques.[3]

Although formal mortality data remain forthcoming, clinicians report year-on-year reductions in breast cancer mortality, consistent with broader system-level changes, including earlier detection and more individualized surgical management.

However, strengthening care at the national referral center addressed only part of the broader challenge. For much of the population in Mongolia, timely access to diagnosis and treatment remained a significant challenge.

Extending Early Detection Beyond the Capital

To better understand barriers to timely access to care, this article's authors performed a nationwide assessment of breast cancer diagnostic, treatment, and service infrastructure. Of all 55 tertiary public hospitals surveyed, consistent mammography was available in only 11 facilities in Ulaanbaatar, and two in the countryside, while the 42 remaining city and rural tertiary hospitals reported no access to mammography services.[5] These findings underscore the structural limitations of a system in which access to screening is largely centralized to one city.

In rural regions of Mongolia, clinical breast examination (CBE) has remained the primary screening modality. While this approach is widely available, its limitations are well documented.

Studies in comparable settings report sensitivity ranging from approximately 40% to 55%.[6,7] National screening data reflect similarly low detection rates. In 2021, more than 332,000 women were screened using CBE across Mongolia, resulting in only three cancer diagnoses, or a rate of 0.009 per 1,000.[8]

In contrast, organized mammography programs in higher-income countries detect approximately four to six cancers per 1,000 women screened, representing a more than 400-fold higher detection rate compared to CBE in Mongolia.[9] This discrepancy likely reflects, at least in part, limitations in the ability and training required to detect disease at an early stage in Mongolia.

In response to these limitations, the NCCM developed an alternative approach centered on extending early detection services directly into communities. Rather than relying on patients to overcome geographic barriers, this model works to bring diagnostic capability to the patient, including use of local clinics when available or, in their absence, mobile units equipped with ultrasound machines to reach even the most remote regions.

Dr. Batsukh Pushkin, chief of the Breast Center at the NCCM, teaches about breast cancer signs and symptoms at a town hall (top) and an elementary school (bottom) in Zavkhan province.

Public gatherings, including town meetings, cultural events, and community concerts, are used as entry points to engage nomadic families who may otherwise remain difficult to reach.

Working in collaboration with the Mongolian Women's Federation and local leaders, the NCCM created a rural ultrasound-based screening program that integrates public education, community engagement, and mobile screening. Educational initiatives are conducted in advance of screening visits, including school-based programs and community outreach designed to increase awareness and participation among women and their families.

In many regions, these efforts are coordinated in close partnership with local government officials and community leaders who play a critical role in organizing events that bring together widely dispersed populations. Public gatherings, including town meetings, cultural events, and community concerts, are used as entry points to engage nomadic families who may otherwise remain difficult to reach.

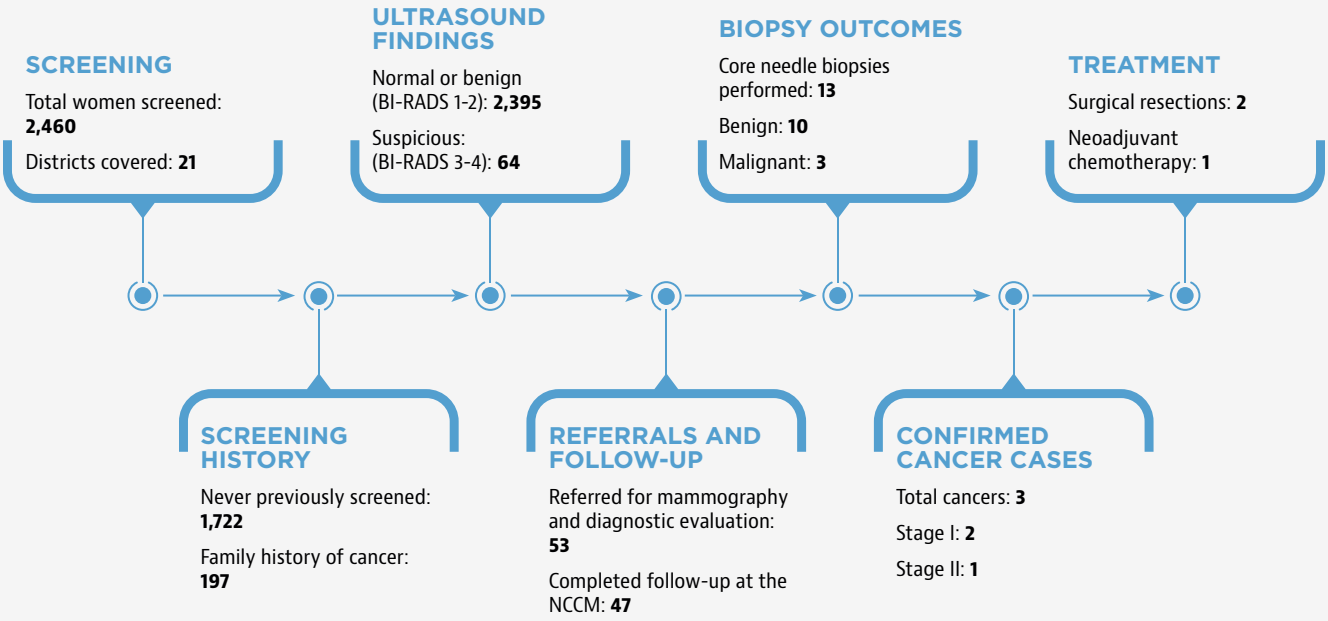
These events serve not only as opportunities for education, but also as a means of building trust and normalizing participation in screening. Following these gatherings, women are invited to attend scheduled screening sessions at local clinics or mobile units in the days that follow, creating a structured pathway from awareness to evaluation. This approach leverages existing social structures to improve participation and ensures that outreach efforts translate into meaningful clinical follow-up.

Screening teams, composed of NCCM breast specialists, radiologists, and surgeons, travel directly to these communities, often over long distances and difficult terrain. All these clinicians participate on a voluntary basis, dedicating their time without compensation to reach populations that would otherwise have little or no access to care, with the goal of improving early diagnosis.

Equipped with portable ultrasound devices, they establish temporary screening sites and provide on-site evaluations using a combination of clinical breast examination and bilateral handheld ultrasound. See the May 2026 ACS *Bulletin* article, "Real-Time Ultrasound Imaging Enhances High-Stakes Surgical Decisions," for more information on point-of-care ultrasound.

Patients with concerning findings on CBE and/or ultrasound are identified immediately and referred to the NCCM for further evaluation. These visits represent more than a screening intervention. They are part of a broader effort to build trust, increase health literacy, and establish a sustained connection between communities and the healthcare system. For many patients, this is their first interaction with preventive care.

This model reflects a fundamental shift in how care is delivered away from a system that depends solely on patients reaching centralized facilities to one that is designed to reach patients where they live.



Implementation in Rural Mongolia

In September 2025, the NCCM breast cancer team carried out a mobile screening deployment in the Zavkhan province, which lacks any mammography services or resident breast specialists, and is one of Mongolia's most remote regions, located more than 22 hours by road from Ulaanbaatar. In 2021, the province was reportedly home to 36,981 women.

Across the 21 districts in the Zavkhan province, the multidisciplinary breast cancer team screened 2,460 women, with a mean age of 45 years (range 20 to 84). Of these, 72% had no prior history of breast screening, and 8% reported a family history of cancer.[8] Each participant underwent a standardized clinical breast examination followed by bilateral handheld ultrasound with prospective Breast Imaging-Reporting and Data System (mobile screening, community engagement, and decentralized diagnostics) classification.

The majority of examinations that month were benign, with 2,331 classified as BI-RADS 1 and 64 as BI-RADS 2. Fifty-five patients were classified as BI-RADS 3, and nine as BI-RADS 4.5 Fifty-three patients were referred for further evaluation, of whom 89% completed follow-up. Thirteen underwent biopsy, and three breast cancers were diagnosed, including two stage I and one stage II. In each cancer case, the lesion was first identified via ultrasound and subsequently confirmed through core needle biopsy and mammography at the NCCM.

In a region where breast cancer has historically presented at advanced stages, these findings represent a meaningful shift toward earlier detection. Equally important, evaluating most patients locally reduced unnecessary referrals and eased the burden on centralized services, offering a level of diagnostic evaluation that, while not equivalent to gold-standard mammographic screening, is substantially better than no access at all. More than 2,400 women received assessment at no cost and without the expense or time of traveling to the capital.

Another benefit of these visits is the opportunity to address one of the underlying drivers of advanced-stage disease in Mongolia: limited awareness.

Among nomadic and rural women, breast cancer is often diagnosed late not only because care is unavailable, but because the early signs and symptoms are unfamiliar, and the importance of seeking evaluation when they appear is not widely understood. Education delivered alongside screening, however modest in any single deployment, may contribute over time to greater recognition of these symptoms and, in turn, to fewer women presenting only after disease has advanced.

Leif Sorensen (bottom right) is pictured alongside the breast team in the Zavkhan province during the mobile ultrasound clinic screening project.

The impact of these efforts reflects not only the value of portable diagnostic technology, but the commitment of clinicians, including specialists such as radiologists and surgeons, who travel long distances on a voluntary basis to communities they would otherwise rarely reach. By building trust and reducing barriers to entry, this approach has enabled sustained participation in screening efforts that would otherwise be inaccessible.

Implications for Expanding Access to Care

The challenges addressed due to Mongolia's geographic isolation, namely limited access to diagnostic services and delayed presentation, are experienced around the world. Similar barriers persist in many health systems, including rural and underserved regions in the US.

Mongolia's experience highlights an important consideration: Effective health systems are not built solely through infrastructure, but through deliberate efforts to ensure that care reaches patients. The approach developed by the NCCM prioritizes accessibility as a central design principle, using mobile screening, community engagement, and decentralized diagnostics to create entry points into the healthcare system for patients who might otherwise remain outside of it. These efforts do not replace comprehensive cancer care infrastructure, but they enable it to function more effectively by ensuring that more patients present earlier in the course of their disease.

Equally important to the diagnostic component of this work is the awareness it brings to rural patients. For many of the women reached through these deployments, the screening visit is also their first sustained exposure to information about breast cancer, including the early signs and symptoms, the value of evaluation when those symptoms appear, and the role of routine screening in detecting disease before it advances. Education delivered alongside screening, reinforced by trusted local leaders and repeated across successive visits, builds health literacy that persists long after the screening team has moved on. Over time, this growing awareness may prove as consequential as the screening itself, preparing rural communities to recognize disease earlier and to seek care sooner.

For surgeons and healthcare leaders in the US, these findings offer a practical perspective. Addressing disparities in cancer outcomes may require not only advances in treatment, but also innovation in how patients access care. Extending services beyond traditional clinical settings, investing in community engagement, and reducing structural barriers to access are strategies that can be adapted

These efforts do not replace comprehensive cancer care infrastructure, but they enable it to function more effectively by ensuring that more patients present earlier in the course of their disease.

The mobile ultrasound clinic van drives through the Mongolian countryside.

The breast team gathers in front of the mobile ultrasound clinic van prior to leaving for the Zavkhan province.

across a range of healthcare environments, and may be especially valuable in rural communities.

Building breast cancer care in Mongolia has required addressing multiple components of the health system simultaneously, including institutional capacity, workforce development, community engagement, and geographic access. Progress has been driven by locally led initiatives supported by sustained collaboration and adapted to the realities of the environment.

A defining feature of this model relies on the engagement of communities and the commitment of clinicians to extend care beyond traditional settings. The results to date demonstrate that meaningful improvements in early detection are achievable, even in some of the most resource-constrained and geographically challenging settings.

Leif Sorensen *is a research scholar and recent graduate of the Master of Science in Clinical Investigation program at The University of Utah in Salt Lake City, where his work centers on global surgery and health systems strengthening. Over the past several years, he has contributed to surgical training and capacity-building initiatives across Cambodia, Mongolia, and Ghana. This fall, Sorensen begins medical school at The Ohio State University College of Medicine in Columbus, with the long-term goal of practicing as a global surgeon.*

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Gaps in E-Bike Regulation Heighten Risks for Young Riders

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Image was created using AI.

Electric bicycles (e-bikes) have rapidly emerged as a major source of pediatric injury, with trauma patterns increasingly resembling those seen in motor vehicle collisions.[1]

GLOBAL E-BIKE SALES were estimated to total 30 million units between 2020 and 2023, reflecting widespread availability and declining cost barriers.[2] Although precise ridership estimates are not available, observations indicate increased e-bike use among middle- and high-school students.

Pediatric trauma centers are seeing the consequences. Several now report e-bikes as the leading mechanism of injury among school-aged children presenting to emergency rooms (ERs) across the US.

Healthcare providers at Rady Children's Health in Orange County, California, treated only one pediatric e-bike crash patient in 2021, compared with more than 220 in 2025. At Rady Children's Hospital in San Diego, California, 446 e-bike patients were treated in 2025, comprising 40% of the institution's trauma activations. These injuries are not only more frequent, they also are more severe, with patterns that resemble high-energy trauma rather than traditional bicycle crashes.[1]

This e-bike injury surge in the US contrasts with trends in Asia, Europe, and the Middle East, where e-bikes were adopted a decade earlier and regulatory changes were made in response to serious injury patterns in both adults and children.

The Mineta Transportation Institute's 2025 report notes that the US regulatory approach is "by no means common worldwide."[3] In fact, most e-bikes sold in the US would not meet European standards, underscoring the permissive regulatory environment.

US e-bike motors are typically three times more powerful than those allowed in Europe and the rest of the world (750 W versus 250-400 W, respectively). As a result, many US e-bikes would be classified as mopeds elsewhere, requiring minimum age thresholds, maximum speeds, licensure, insurance, and formal safety education. Many countries set a minimum age for e-bike use (often around 16 years of age for devices like US Class 2 e-bikes) and do not allow the use of throttle e-bikes.

In the US, children are allowed to operate devices capable of 20–28 mph—and, when illegally modified, more than 50 mph—without formal training or consistent helmet enforcement.

State policymakers are beginning to respond to this issue, but the pace of policy development lags far behind the rate of adoption. The widening gap continues to expose children to high-energy injury risk.

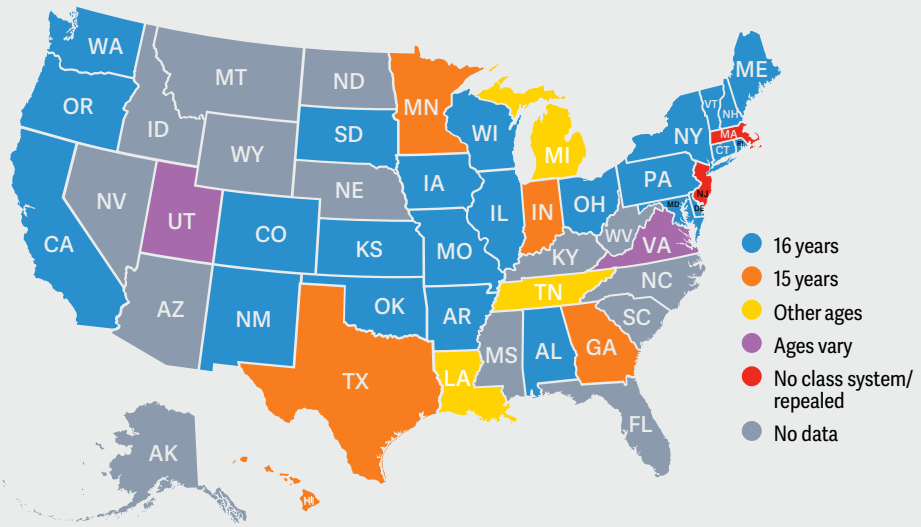
What Research Shows

More than 150 studies have examined e-bikes, primarily focusing on lower-powered models comparable to US Class 1 e-bikes, and demonstrate a very serious pattern of e-bike-related injury and mortality. A limitation of these studies is the variability in motor wattage and maximum speed permitted across countries.

In a 2-year, Level I US trauma center study published before the pandemic, e-bike injuries accounted for 14% of all pediatric traffic-related hospitalizations.[4] National Electronic Injury Surveillance System (NEISS) data show a sharp spike in injuries since that time with pediatric e-bike injuries increasing from 4.18% of all recorded cases in 2019 to 49.8% in 2023.[2] In California, e-bike incidents rose 1,800% from 2018 to 2023.[5]

A 2018 Dutch Level I trauma study found that while e-bikes accounted for only 2.9% of total bicycle crashes, they represented 27.6% of all bicycle-related fatalities nationwide.[5] Prompted by research showing high-crash risks, Dutch policymakers reclassified e-bikes in 2017. For high-speed e-bikes (up to 28 mph), they mandated a minimum owner age of 16, while restricting standard e-bikes to a 15-mph maximum speed.

Age Minimums for Class 3 E-Bike Operators in US States



Source: December 2025 report from the Mineta Transportation Institute. Laws and regulations regarding e-bikes are evolving; some information may no longer be current.

A 2019 World Health Organization report described efforts to protect e-bike riders in China, who accounted for 14% of all traffic-related deaths. E-bikes in that country have been limited to a maximum of 16 mph, with a 400-W motor, and a minimum age of 16 to operate in some regions. In addition, e-bikes are banned in many pedestrian throughfares.

Why Children Are at Heightened Risk

High-powered devices, inexperienced riders, and unprotected road environments created a perfect storm for pediatric trauma. The risk factors for pediatric e-bike injuries are multifactorial, and include mechanical, developmental, and environmental factors that extend beyond the risk associated with conventional bicycles.

Mechanical: Speed and Kinetic Energy

E-bikes allow speeds of 20–28 mph with minimal effort; illegal modifications can push speeds past 50 mph.

In a NEISS study, nearly half of speed-related (more than 20 mph) pediatric e-bike injuries involved the head, neck, or face, and 24.1% resulted in internal organ injury—more than double the rate of non-speed-related crashes.[2] The heavier weight of e-bikes (30–60 pounds) and higher speeds increase kinetic energy and lengthen stopping distance, often beyond what young riders can safely manage.

Low Rates of Helmet Use

Helmet use among injured pediatric e-bike riders remains low. In a neurosurgical series of 20 children with e-bike-related cranial trauma, none wore a helmet.[6] Another pediatric ER study found helmet use in only 19% of cases.[7] The predictable result is a pattern of skull fractures, intracranial hemorrhage, and long-term neurologic morbidity.

Developmental Limitations

Children lack the hazard recognition, braking control, and judgment required to safely operate a motor-assisted device. Their limited ability to anticipate traffic behavior is compounded by perceptual errors made by drivers: Motorists underestimate the time-to-arrival of fast-moving e-bikes, increasing the collision risk.[8]

Environmental Factors: Unsafe Infrastructure

Children riding in dense traffic or on rural roads without protected lanes face substantially higher exposure to high-energy collisions. Built-environment studies show that unsafe or unprotected routes increase the likelihood of traffic conflict for school-aged riders.[9]

Injury Patterns Are More Like Motorcycles than Bicycles

Head and Cranial Trauma

Head injuries remain the most devastating category of pediatric e-bike trauma. One study reported that 85% of children with e-bike-related cranial injuries sustained skull fractures, 30% had intracerebral contusions, 15% had epidural hematomas, and 30% had subdural hematomas.[6] Nationally, head trauma from e-bike crashes increased 49-fold between 2017 and 2022 across all age groups.[10]

These injuries are not only more frequent, they also are more severe, with patterns that resemble high-energy trauma rather than traditional bicycle crashes.[1]

Internal Organ Injury and Hospitalization

Internal injuries are increasingly recognized as a hallmark of high-speed e-bike crashes. A study demonstrated that 24.1% of speed-related e-bikes crashes result in internal organ injuries, compared to 10.4% of non-speed-related crashes.[2] This internal trauma included abdominal

and thoracic organ injuries, including splenic lacerations, hepatic injury, and pulmonary contusions. Even low-velocity crashes can result in occult internal trauma when handlebars strike the abdomen or chest.

Orthopaedic Trauma

Orthopaedic injuries are another major component of pediatric e-bike trauma. One study noted 50% of e-bike-injured children sustained skeletal injuries—significantly higher than automobile passengers (24%).[4]

Even low-velocity crashes can result in occult internal trauma when handlebars strike the abdomen or chest.

Comparative Severity of E-Bike Injuries versus Non-Motorized Bicycles

Across multiple studies, pediatric e-bike injuries consistently demonstrate greater severity than injuries from conventional bicycles. Children injured on e-bikes are more likely to present with multisystem trauma, higher Injury Severity Scores, and a greater likelihood of requiring operation or intensive care admission.[2,4,6-8]

Burn and Electrical Injuries

Lithium-ion battery malfunction introduces a distinct and increasingly recognized category of pediatric e-bike injury not seen with traditional bicycles. E-bikes rely on high-energy rechargeable batteries that can fail, triggering rapid, uncontrolled heating. E-bike battery explosions release toxic gases and may reignite after appearing extinguished. These events can cause deep dermal or full-thickness burns requiring operative management and have caused multiunit housing fires leading to many deaths.[5]

Prevention Strategies

Effective prevention of pediatric e-bike trauma requires a multipronged approach addressing the child rider, device, and environment.

Consistent helmet use remains the most important protective behavior. The Consumer Product Safety Commission (CPSC) recommends a Department of Transportation-approved helmet for bicycles exceeding 20 mph.

Helmet legislation, school-based education, and both law and parental enforcement, along with modeling behavior, are essential to increasing compliance. Training programs that teach braking technique, hazard recognition, and safe riding behavior can help align children's skills with the performance of the devices they operate. Most importantly, the CPSC recommends that children under 12 years should not operate motorized products that exceed speeds of 10 mph. Recommendations such as this have led some countries to prohibit children under 12 from operating any class of e-bike.

Device-focused strategies include selecting age-appropriate e-bikes with lower maximum speeds, lower motor wattage, restricting aftermarket modifications, and ensuring that lights, reflectors, batteries, and braking systems are properly maintained.

Environmental strategies—such as protected bike lanes, traffic calming, and safer intersection design—reduce exposure to high-risk traffic. Public health messaging that frames e-bike safety alongside seat belts and car seats may further normalize protective behaviors.

Parents must ensure their children can safely operate a pedal bicycle before advancing to a more powerful e-bike and understand

California Youth E-Bike Safety Legislation

Bill	Primary Impact	Key Provisions on Youth Safety
AB 1946 (2022)	Directs California Highway Patrol to develop a statewide safety and training program for e-bike users, with emphasis on vulnerable road users	Establishes standardized statewide education to improve rider skills and reduce youth injury risk
SB 1271 (2024)	Expands enforcement authority for unsafe e-bike operations; allows impoundment of e-bikes ridden dangerously or by underage riders	Strengthens enforcement of unsafe riding and underage operation
AB 2234 (2024)	Creates the San Diego Electric Bicycle Safety Pilot Program to prohibit riders under 12 from operating Class 1 and Class 2 e-bikes	Introduces age restrictions for younger riders
AB 1778 (2024)	Creates the Marin E-Bike Safety Pilot Program; prohibits individuals under 16 from operating Class 2 e-bikes; mandates helmet use for all ages	Introduces age restrictions and helmet requirements to reduce high-energy injuries among younger riders
AB 544 (2025)	Requires a rear red reflector or flashing red light visible from 500 feet at all times on e-bikes; extends helmet and safety-course requirements for minors	Improves visibility and strengthens protective requirements for youth riders
AB 965 (2025)	Prohibits the sale of Class 3 e-bikes to individuals under 16; violations subject to fines up to $250	Limits youth access to the fastest, highest-risk e-bikes and holds retailers accountable

the financial and liability risks if their child damages property or injures others.

Why Legislative Action Cannot Wait

Legislative and regulatory frameworks have not kept pace with the rapid adoption of e-bike use among minors. Many jurisdictions classify e-bikes into tiers based on maximum-assisted speed and throttle capability, but enforcement of age restrictions and speed limits is inconsistent, and high-powered devices remain accessible to children.

The story of Amelia Stafford, a Marin County (California) teenager who sustained a serious e-bike injury, was featured in a July/August 2024 ACS *Bulletin* article and subsequently in *The New York Times*. Her story is described as the "crash heard around the country" and galvanized both California and federal-level action, highlighting the power of patient and surgeon advocacy to catalyze legislative change.

California Youth E-Bike Safety Legislation

As of May, three California bills aim to reduce youth injury. AB 2346, sponsored by the California Medical Association, will impose a 15-mph speed limit for riders under age 15 statewide (and a 10-mph limit on sidewalks). AB 2595 will allow San Mateo County cities to require e-bike riders to be at least 12 years old, following similar ordinances in San Diego and Marin counties. SB 1167 will revise the existing vehicle code definition of mopeds or motorcycles to include electric devices with more powerful motors beyond 750 watts and subject them to new disclosures at the point of sale.

California law requires a driver's license to operate an e-scooter, whose motor ranges from 250-600 W and travels at slower maximum speeds of 15-22 mph. Perhaps a license also should be required for e-bike users. Class 3 e-bikes travel at speeds (28 mph) comparable to mopeds (limited to 30 mph by the Department of Motor Vehicles). Using the name "e-moped" could provide greater clarity to purchasers about Class 3 risks.

In 2026, legislators in New Jersey repealed the three-class e-bike system, and mandated licensure, insurance, registration, education, and a minimum age of 16 to operate an e-bike statewide.

Federal E-Bike Regulation

A fragmented, state-by-state approach is generating confusion for consumers, retailers, and law enforcement. To solve this crisis, we need immediate and comprehensive federal regulation.

Convening a national task force to standardize state laws would be another starting point to clarify the current regulatory patchwork.

Fully understanding the problem requires examining its root cause. HR 727, passed by Congress in 2002, defined "low-speed bicycles" as having fully operable pedals, an electric motor less than 750 W (1 horsepower), and a maximum speed of 20 mph. HR 727 declared that e-bikes are not motor vehicles under federal transportation safety standards, placing them instead under the jurisdiction of the CPSC, effectively regulating them as consumer products like tricycles, not motorized vehicles like mopeds.

Congress never anticipated what would happen next. They did not define a "high-speed electric bicycle" or authorize throttle-powered Class 2 e-bikes or the 28-mph Class 3 models. Instead, industry advocacy groups proposed the 3-class system in the mid-2010s during a federal regulatory vacuum, and states adopted it piecemeal resulting in a patchwork of conflicting state laws on age limits, speeds, helmet requirements, and motor wattage.

At the federal level, HR 5265, the SAFE Ride Act of 2025, directs the US Secretary of Transportation to support state grant programs that maintain comprehensive e-bike safety initiatives through the National Highway Traffic Safety Administration. States must create an effective system for enforcing safety requirements governing shared e-bike operations, and ensure operators and users comply with established rules. The states also must make e-bike safety education publicly available and incorporate national curricula into outreach. The ACS Legislative Committee endorsed HR 5265, and an action alert is available at ACS SurgeonsVoice.

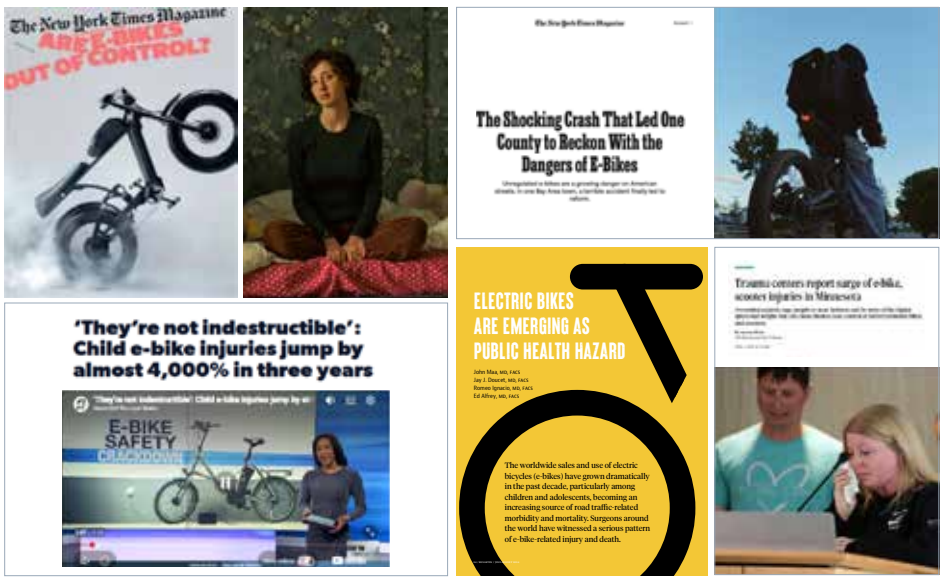
HR 5265 is directionally correct, but more needs to be done. The CPSC should end the deceptive sale of overpowered devices marketed online that exceed legal e-bike specifications. More broadly, Congress should redefine an e-bike as a motorized vehicle, move oversight to the Department of Transportation, and reduce motor power.

Call to Action

The current e-bike safety crisis recalls the early days of mopeds in the 1970s, when regulations struggled to keep pace with their rapid adoption, triggering a strong legislative response.

In 2025, the ACS, American Academy of Orthopaedic Surgeons, and American Association of Neurological Surgeons issued statements to increase public awareness and advocate for legislation to protect e-bike riders. Organizations focused on the health and well-being of children, including the American Academy of Pediatrics, American Medical Association, American Pediatric Surgical Association, and American College of Emergency Physicians, should develop similar policy statements.

The evidence is clear, and one possible solution is to require Class 1 e-bike users to be 12 years and older, while Class 2 and Class 3 e-bike riders must be 16 years or older.



Media coverage of pediatric e-bike injuries has expanded alongside increasing concerns about safety, regulation, and preventable trauma among young riders.

These measures represent early but important steps toward a coordinated safety approach. This long-term effort will require health professionals to partner with school leaders, law enforcement, elected officials, and stakeholders like the Centers for Disease Control and Prevention and US Secretary of Transportation to stem the growing epidemic of youth e-bike-related morbidity and mortality.

Surgeons can advocate at the local, state, and federal levels by meeting with policymakers, attending ACS state advocacy days, submitting editorials to media outlets, and participating in forums and town halls to raise public awareness. The most powerful voices are the young patients who have been injured and their family members, alongside their physicians, calling for change.

Pediatric e-bike injuries represent a rapidly evolving public health challenge. The devices are powerful, widely accessible, and increasingly used by children who lack the ability to safely operate them. The resulting head trauma, internal organ damage, complex fractures, maxillofacial injuries, penetrating trauma, and battery-related burns are severe, costly, and preventable.

Without stronger regulation, the burden of pediatric e-bike trauma will continue to rise. Surgeons are uniquely positioned to advocate for evidence-based policy, including age restrictions, device regulation, and safety education. Decisive action is required to reduce preventable morbidity and mortality while preserving the benefits of e-bikes as a transportation option. B

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The most powerful voices are the young patients who have been injured and their family members, alongside their physicians, calling for change.

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Dr. Megan Tracci

Voice of Surgeons Is Amplified Through Grassroots Advocacy

Margaret (Megan) C. Tracci, MD, JD, FACS
Courtney Lisowski

Decisions made at all levels of government have a direct impact on surgeons and patients.

WHILE SURGEONS ARE FOCUSED on the daily work of delivering excellent clinical care, the ACS is working behind the scenes to advocate on behalf of its members. The Division of Advocacy and Health Policy in Washington, DC, includes a team of experienced government professionals who engage with policymakers at the state and federal levels.

However, meaningful change in Washington, DC, often requires more than traditional advocacy alone. The participation of surgeons from across the country, supporting policy priorities and making their voices heard, is necessary. Grassroots advocacy is one of the most powerful tools the ACS has to influence policy, protect surgical care, and ensure that the voices of surgeons are heard.

The Centers for Medicare & Medicaid Services (CMS) finalized its calendar year 2026 rule for the Medicare Physician Fee Schedule (MPFS) in November 2025, which included a provision that put in place a 2.5% reduction to work relative value units (wRVUs) with additional reductions every 3 years.

The rationale underlying this "efficiency adjustment" is directly contradicted by ACS-supported, peer-reviewed longitudinal data. A study reviewing 1.7 million cases from the ACS National Surgical Quality Improvement Program registry showed that instead of reaping the rewards of increased efficiency in the OR, as CMS has suggested, surgeons are doing longer cases on more complex patients than they were just a few years ago.*

To amplify this message, the ACS launched a coordinated grassroots campaign that helped more than 3,000 ACS members send more than 10,000 letters to members of Congress expressing their concerns with the new policy proposal. While the rule went into effect as scheduled on January 1, 2026, the powerful outreach by ACS members, anchored by strong data, has had real impact.

Elected officials have heard the call for action.

Following this effort, Representatives Ron Estes (R-KS) and Tom Suozzi (D-NY) introduced HR 7520, the Efficiency Adjustment Delay Act, that would delay the "efficiency adjustment" until 2030 and direct CMS to put forward data on why an efficiency adjustment is necessary before implementing a one-time adjustment. For more information on this topic, read "Surgeons Advance Evidence-Based Critique of Medicare Payment Reform" later in this issue.

This effort demonstrates the powerful influence of grassroots advocacy. While the letter campaign reflected participation by a relatively small fraction of more than 95,000 ACS members, it helped drive congressional action; imagine the impact of even broader surgeon participation.

Members of the ACS can participate in grassroots advocacy by:

- **Visiting SurgeonsVoice:** The ACS Professional Association's (ACSPA) nationwide, interactive advocacy program gives surgeon-advocates the ability to send pre-drafted, ACS-approved messages to their elected officials (SurgeonsVoice.org).

- **Learning More About SurgeonsPAC:** (only dues-paying US citizens and green card holders are eligible to contribute) ACSPA-SurgeonsPAC provides nonpartisan financial support to help elect and re-elect candidates for federal office who support and are positioned to advocate on behalf of ACS legislative issues.

- **Joining the Grassroots Network:** The new Grassroots Network provides ACS members with advocacy training, opportunities to build relationships with elected officials, and a platform for coordinated federal and state outreach on policies affecting the surgical profession.

- **Attending the ACS Leadership & Advocacy Summit:** The ACS Leadership & Advocacy Summit is held annually in Washington, DC, and offers attendees an opportunity to learn about the College's overarching priorities while receiving extensive advocacy training before participating in meetings with lawmakers on Capitol Hill. Grants are available to support resident attendance at this meeting. Read more about the meeting in the April 2026 ACS *Bulletin* article, "Surgeons Bring Their Case to Capitol Hill at 2026 Advocacy Summit."

- **Organizing State Chapter Advocacy Lobby Days:** Chapter grants are available to help chapters plan and host state-level advocacy days. Advocacy days provide chapter members with opportunities to engage in important issues ranging from prior authorization and medical liability reform to noncompete clauses in contracts and injury prevention. State advocacy resources, including toolkits, guides, and legislation trackers, are available at *facs.org/advocacy/state-legislation*.

- **Participating in the Advocacy at Home Program:** When senators and representatives return home during district work periods, they tend to visit with constituents to learn more about important issues facing their states and districts. Participating in in-district meetings provides valuable opportunities to meet with your policymakers and assist them in gauging what is important to surgeons and the surgical community.

Grassroots advocacy is essential to advancing the priorities of the surgical community and supporting the future of surgery. By getting involved, ACS Fellows have a voice and can help shape policies that protect our patients and profession.

More information about grassroots advocacy is available at *facs.org/advocacy/get-involved/surgeonsvoice/grassroots-guide*.

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Dr. K. Thomas Pham

Dr. Tyler York

Sustainable Training Strengthens Kidney Transplant Capacity in Resource-Limited Systems

K. Thomas Pham, MD, FACS
Tyler York, MD

US funding of worldwide aid and global health has decreased dramatically in recent years.[1]

BILLIONS OF DOLLARS have been cut from programs developing clean water infrastructure and from programs providing preventive care and treatment of infectious diseases such as HIV and malaria.[1] Clinicians working in the global surgery space seek to improve healthcare outcomes and achieve equity for all who require surgical care.

The development of surgical capacity is a critical component of combating the global burden of disease. Numerous studies have revealed that capacity for treatment of surgical disease is deficient in developing countries, which leads to increased mortality.[2] It is estimated that surgical care treats 20%-30% of the global burden of disease. Despite this reality, global surgery receives less than 1% of total global health funding.[3]

To sustain global surgery initiatives, we must adapt to the current paucity of funding by leveraging our existing resources to drive the worldwide development of surgical care. This approach includes narrowing our focus to surgical treatments that will continue to have a wide impact on a particular country's overall health.

Physicians who participate in surgical missions provide operations that local citizens may not have access to because of a skills and knowledge gap or lack of resources.

Mission work, although undoubtedly beneficial, is not sustainable for the mission providers or the patients and communities they serve. Missions depend on altruistic or private donations while communities can only receive care when the mission is available with little to no follow-up after the surgical mission.

Global CKD Burden Exposes Inequities in Care

It is estimated that 850 million people worldwide are living with chronic kidney disease (CKD).[4]

Disability-adjusted life years (DALYs) due to CKD

Left:
Dr. H. Albin Gritsch, Dr. Aggrey Mweemba, and the transplant team performed the first pediatric kidney transplant in Zambia.

Right:
Husband and wife Wilcliff Sakala (recipient) and Clare Mutale (donor) stand together 1 month after their living donor kidney transplant.

The mission is to train and upskill local providers to provide safe, sustainable, and reliable care.

Dr. Victor Mapulanga, Dr. Ken Tran, Dr. Tsuyoshi Todo, and Dr. Bassem Wadie work together to help patients.

disproportionately affects populations in low- and middle-income countries (LMICs) due to the lack of adequate healthcare infrastructure to support those living with the condition.[4]

The primary management of advanced CKD and end-stage renal disease (ESRD) continues to rely on decades-old care pathways of dialysis and kidney transplantation. In developing countries, patients with ESRD die prematurely and experience diminished quality of life due to the lack of access to high-quality dialysis care.[5]

The prevalence of CKD and ESRD, specifically in sub–Saharan Africa, is undetermined because of the lack of renal registry data. In Zambia, dialysis is paid out of pocket by the patient.[6] In countries that do not have access to kidney transplantation, patients and their families are subjected to a large financial burden to support their loved ones. Families that have higher incomes can either maintain dialysis or obtain their kidney transplant in neighboring countries, which in turn promotes transplant tourism. This reality perpetuates the widening health disparity seen throughout the continent.

Value of Hands-On Training

The ACS H.O.P.E. Kidney Transplant Capacity Initiative is the largest multidisciplinary and multi-institutional group of healthcare providers focused on developing safe and sustainable kidney transplant programs in LMICs. The mission is to train and upskill local providers to provide safe, sustainable, and reliable care. We provide training and education in several forms, ranging from virtual lectures to hands-on skills training with daily management of surgical and medical patients.

Traditional training models bring trainees to high-volume centers where they gain experience and skills with the goal of bringing this knowledge back to their local communities. This training pathway does not address the inherent barriers of practicing in a resource-limited country. Surgical infrastructure and resources at a high-volume center are developed and more readily available than a center located in a developing country.

In this traditional model, the responsibility then lies solely on the newly trained surgeon to develop surgical infrastructure

in their community while simultaneously developing their own surgical skills. This traditional training approach was implemented in Zambia a decade ago, but the initiative failed due to resource limitations and other challenges.

In-person and hands-on training are essential for the Kidney Transplant Capacity Initiative to succeed because it allows us to work with local collaborators and overcome barriers to providing care. This approach enables local providers to advocate for specific resources necessary to achieve their goal.

Kidney Transplantation Is Primary Cure for ESRD

Kidney transplantation significantly lowers mortality rates, decreases the chance of cardiovascular events, and improves quality of life when compared to dialysis alone.[7]

Unfortunately, despite the lifesaving benefit of transplantation, only 314 (less than 1%) of 111,135 kidney transplants completed worldwide were performed in Africa in 2023.[8]

In the developing world, pre-existing and longstanding barriers to developing sustainable kidney transplant programs include (but are not limited to) lack of adequate government and individual financial resources, skepticism and local cultural attitudes toward transplantation, poor health literacy, and lack of legislation and policies that advance organ transplant care.

ACS H.O.P.E.

Creating surgical capacity for sustainable surgical programs in the developing world requires extensive multidisciplinary collaborative efforts.

Despite reduction in US aid, surgical societies such as the ACS continue to promote global surgery and health equity. Specifically, the ACS Health Outreach Program for Equity in Global Surgery (ACS H.O.P.E.) is one of the largest and most effective global surgery programs available to US surgeons. ACS H.O.P.E. provides surgeons with opportunities for domestic and international volunteerism with a focus on collaboration and community-based interventions.

The ACS H.O.P.E. pillars of development include clinical care, research, and quality initiatives with the goal of identifying local champions who will lead these efforts with assistance from ACS surgeons. This program has developed collaborations with

Dr. Amy Lu, Dr. Ken Woodside, Dr. Victor Mapulanga, Dr. Emmanuel Liche, Dr. Aggrey Mweemba, and the transplant team pose with the kidney transplant recipient.

several international partners, including Hawassa, Ethiopia; Lusaka, Zambia; and Kigali, Rwanda. Several of these clinical programs provide acute care surgery, laparoscopy, hepatobiliary surgery, cardiac and thoracic surgery, pediatric surgery, and transplant surgery.

Ultimately, the goal of these partnerships is to exchange knowledge and collectively advance the field while developing sustainable surgical programs.

Building on the well-established ACS H.O.P.E. infrastructure, the Kidney Transplant Capacity Initiative has successfully developed a kidney transplant program. The initial focus of this transplantation program is to provide clinical care. But as the case volume increases, the focus will expand to include the development of quality initiatives and research.

Given the lack of established deceased donor infrastructure in most low-income countries and LMICs, the focus has been on creating living kidney donation surgical programs.

The Kidney Transplant Capacity Initiative consists of transplant surgeons and nephrologists that work directly with their respective counterparts at the University Teaching Hospital (UTH) in Lusaka, Zambia. Since we began in 2024, we have performed 17 living donor kidney transplants. Two of these transplants were in pediatric patients, which were the first pediatric transplants performed in the country. Three of these donors underwent laparoscopic nephrectomy which also were a first in the country. All these operations were performed alongside Zambian surgeons using UTH resources and equipment.

The University Teaching Hospital in Lusaka, Zambia

Our work does not stop once the patient leaves the OR. Transplantation relies heavily on multidisciplinary care, and so we promote a culture of communication and collaboration between the respective UTH teams. An example of equitable knowledge transfer occurs when UTH surgeons, who have more experience in open nephrectomy, work with US surgeons trained exclusively in laparoscopy.

While the benefits of minimally invasive surgery are well established, its use in developing countries remains limited. This reality is partly because of the lack of consumables necessary to perform laparoscopic surgery. Our primary objective for the living donor has been to perform

These local champions are not only trained in their respective fields but are also essential in navigating the hospital and healthcare system.

open nephrectomies through a flank incision. This approach has been shown to be more sustainable and in line with the resources and experience at UTH.

Partnerships at Home and Abroad

Kidney transplant capacity necessitates a multidisciplinary alignment and an expensive system of support services and resources, including OR equipment, skilled nursing, medications (immunosuppression), and infrastructure for both pre- and postsurgical evaluation.

We have identified local champions from all necessary specialties including surgery, nephrology, anesthesia, intensive care unit nursing, and OR nursing and staff. These local champions are not only trained in their respective fields but are also essential in navigating the hospital and healthcare system.

Furthermore, involvement of local stakeholders is essential for navigating the sometimes-unfamiliar local government and legal systems that play a pivotal role in the sustainability of surgical programs in underresourced countries.

Transplantation is a specialty that relies heavily on multidisciplinary support, from not only medical and surgical experts, but also social workers, pharmacists, nursing staff, and coordinators. In this regard, leveraging expertise from established global academic transplant centers remains crucial for success.

The development of the Kidney Transplant Capacity Initiative is the collaborative efforts of multiple transplant centers, physicians, transplant staff, and their respective international societies. For more information about participating in global health initiatives, visit *facs.org/acshope*.

Disclaimer

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

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Dr. Ali Mohamed

Neurosurgeons Advocate for Responsible Use of AI in Prior Authorization

Ali A. Mohamed, MD, MS
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Prior authorization is a well-recognized barrier to timely surgical care, contributing to treatment delays, increased administrative burden, and patients forgoing indicated procedures without demonstrable improvements in clinical outcomes or healthcare expenditures.[1]

AS ARTIFICIAL INTELLIGENCE (AI) is increasingly deployed within prior authorization workflows, new ethical, clinical, and administrative concerns have emerged that may affect surgeons across specialties.

Recent applications of AI-enabled prior authorization systems have been associated with more than a two-fold increase in denials and error rates approaching 90% in post-acute care cases.[2] Additionally, growing evidence suggests that poorly governed AI systems may amplify existing disparities across race, gender, and other demographic factors, raising concerns for equitable access to surgical care.[3]

Recognizing these shared challenges, the Council of State Neurosurgical Societies (CSNS) established an AI Ad Hoc Committee to evaluate the role of this technology in clinical and academic practice and to inform policy that can be leveraged across organized surgery. The committee developed a comprehensive policy addressing responsible use, privacy and security, transparency, academic integrity, and financial interests in the context of AI adoption in neurosurgery.[4]

In an effort to generate an empirical foundation for policymaking, the committee also initiated a series of original investigations that addressed the following:

- Evaluation of AI tools in peer review[5]
- Assessment of journal AI policies[6]
- Performance analysis of neurosurgery-specific large language models across education and patient communication[7-8]
- Study of generative models for procedural and anatomical representation[9]
- Predictive modeling of abstract acceptance and presentation outcomes at national meetings[10]

Taken together, these efforts position the CSNS methodology as a practical case study in specialty-driven AI governance. Importantly, this policy development framework provides a scalable and reproducible model for other surgical organizations and societies seeking to address AI governance within their own specialties.

Key Elements for Building a **Specialty AI Governance Work Group**

Form a multidisciplinary committee
(Include clinicians, researchers, educators, and members with AI, ethics, policy, or informatics expertise)

Define a focused governance mission
(Establish clear goals such as evaluating clinical AI use, informing policy, identifying risks, and guiding advocacy)

Align with existing professional standards
(Ground recommendations in current ethical, legal, and specialty-specific guidance rather than developing policy in isolation)

Generate specialty-specific evidence
(Pair policy development with original research evaluating AI applications, performance, risks, and limitations relevant to the field)

Address real-world, high-impact use cases
(Focus on areas with immediate consequences for patients and physicians, such as prior authorization, documentation, education, and peer review)

Engage organized advocacy structures
(Work through specialty societies, state societies, and national advocacy committees to translate governance principles into policy action)

Access the complementary episode of *The House of Surgery* podcast.

Key elements of this approach include establishing a multidisciplinary committee with clinical, academic, and informatics expertise, particularly in the domain of AI. Early alignment with existing ethical and professional standards is essential, alongside generating original empirical data to inform policy decisions.

Intentional engagement with national and state-level advocacy bodies further strengthens the impact and reach of these efforts. By grounding policy in specialty-specific evidence while maintaining alignment with broader surgical and medical principles, societies can ensure that AI guidance remains clinically relevant and evidence-based.

Building on this work, the CSNS passed Resolution XIII-2025F to oppose unmonitored use of AI by commercial insurers in prior authorization processes through engagement with the Washington Committee for Neurological Surgery, which is a joint committee of the Congress of Neurological Surgeons and American Association of Neurological Surgeons.[11]

This resolution underscores how specialty societies and individual surgeons can engage in grassroots advocacy through state and national organizations to shape policy at the payer and legislative levels. Concurrently, the committee has launched a formal investigation evaluating the performance and limitations of AI models in prior authorization tasks, with the goal of informing evidence-based governance rather than unchecked adoption. Through coordinated policy development, empirical investigation, and member-driven advocacy, organized surgery is increasingly positioned to guide the ethical, transparent, and accountable integration of AI into healthcare delivery.

The next phase of advocacy must extend beyond specialty societies and toward system-level adoption and enforcement of responsible AI governance. This evolution should include collaboration with stakeholders like hospital systems, accrediting bodies, payer organizations, and federal and state regulators to establish standards for transparency, auditability, and clinician oversight of AI-enabled prior authorization tools.

Moving the field forward will require sustained engagement, cross-specialty collaboration, and a commitment to translating policy into practice to ensure that AI serves as a tool to enhance, rather than obstruct, high-quality care. B

Disclaimer
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The next phase of advocacy must extend beyond specialty societies and toward system-level adoption and enforcement of responsible AI governance.

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Dr. Lenworth Jacobs Jr.

Rapid AI Integration in Surgery Raises Safety and Governance Concerns

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

Artificial intelligence (AI) is driving rapid and widespread change in surgical practice.

cholecystectomies have been performed autonomously by AI-trained robotic systems without direct human intervention. Similar to this advancement in complete automation, AI also is enhancing remote care through telesurgery, enabling surgeons to perform robotic-assisted prostatectomies with the surgeon and patient in different countries. The idea that a surgeon may not be physically in contact with the patient during an operation is no longer extraordinary.

This rapid AI evolution in key areas of surgery has fundamentally reshaped the surgeon-patient relationship. Robotic procedures are routinely performed across multiple specialties, including cardiac, abdominal, and pelvic surgery.

While the transition from open surgery to minimally invasive laparoscopic techniques began in the late 1990s and early 2000s,[1] robotic surgery soon followed, evolving from a novel innovation into a widely available and increasingly ubiquitous platform. More than 12 million procedures have been performed by more than 60,000 surgeons using the da Vinci system.[2]

These advances offer significant promise—but they also demand careful evaluation.

Surgeon-Patient Relationship at Risk

Technological change has the potential to alter core tenets of the surgeon-patient relationship. Historically, surgeons evaluated patients in person, obtained a history, performed a physical examination, ordered diagnostic tests, and explained diagnoses and treatment plans to the patient. Surgeons met patients preoperatively, performed the operation, communicated outcomes to patients and their families, and provided postoperative care. This continuity fosters trust, confidence, and accountability.

This care model is increasingly being challenged. Greater reliance on electronic health records (EHRs), robotics, shift-based care, and multiple surgeons interacting with the same patient has introduced both physical and conceptual distance.

The risk is that the surgeon-patient relationship may shift from one grounded in trust and continuity to one that is more transactional. These concerns are magnified with remote or autonomous AI-guided robotic surgery. In the event of an adverse outcome, inadequate or imprecise explanations of complex, novel technologies can quickly erode trust and damage the surgeon-patient relationship.

Ethical Foundations in the AI Era

Ethics remains central to surgical practice. The foundational principles of beneficence, nonmaleficence, and justice remain unchanged:

- **Beneficence:** Acting in the patient's best interest
- **Nonmaleficence:** "First, do no harm"
- **Justice:** Ensuring fair and equitable care

These principles take on heightened importance as AI-driven and remote surgery expand. Patients must understand:

- What procedure is being performed
- Who—or what—is performing the operation
- Expected outcomes
- Potential risks and complications
- Who is accountable if something goes wrong

Failure to clearly communicate these elements, particularly when new technologies are involved, undermines trust and threatens the ethical foundation of surgical care.

Accelerating Pace of Change

The integration of EHRs, AI, and shift-based surgical care has transformed clinical practice. These changes have improved efficiency and access to information but have also contributed to fragmentation.

Patients increasingly turn to online sources rather than their surgeon for information and reassurance. While these individuals seek trusted guidance from someone with experience, judgment, and time, this is a role that has been historically filled by the surgeon.

Unfortunately, the expectation of receiving evidence-based guidance from a trusted clinician is no longer guaranteed, especially if the information is coming from an unsubstantiated online source. With optimal patient care potentially at risk, it is worth asking how

and why these changes have evolved—and what will they mean over the next 20–30 years.

Cars Without Drivers, Surgery Without Surgeons?

Other industries offer instructive parallels. The shift from horse-drawn carriages to automobiles required infrastructure, regulation, education, licensure, and legal accountability. The transition forced a clear assignment of responsibility for safety, establishing who would be held accountable for passengers and others on the road. Public safety depends on clearly defined standards and responsibilities.

Today, driverless cars raise new questions about accountability when no human operator is directly responsible for the operation of a vehicle. Careful thought and regulations should be in place to standardize this transportation modality because with driverless cars, by their very definition, there is no driver responsible for the safety of the passengers and other vehicles on the road.

Aviation provides an even stronger example of the importance of standards. Once plagued by accidents, aviation became one of the safest industries in the world through rigorous standardization, training, certification, and global coordination. Safety has become the unifying principle of this industry.

Surgery stands at a similar inflection point. As AI becomes more integrated into operative care, comparable standards, safeguards, and accountability structures are essential.

AI as a Transformative Force

AI is already integrated into multiple aspects of surgical care. It can assist with clinical documentation, analyze imaging and data, support decision-making using large datasets, facilitate informed consent discussions, and enhance intraoperative precision and safety.

In 2025, robotic systems were trained using surgical video data. As stated earlier, a robotic system autonomously performed a cholecystectomy.[3] More recently, a surgeon in London successfully performed a robotic-assisted prostatectomy on a patient in Gibraltar—more than 1,000 miles away—with negligible latency.[4]

While this telesurgery approach expands healthcare access to specialists for remote populations, it also raises critical questions. How are intraoperative complications managed from such distance? Who is accountable across state or national borders?

One could imagine significant concerns raised in the event of an intraoperative catastrophe. In the US, performing operative procedures in different states would require state-specific licenses. These safety and accountability-related considerations are even more profound if the surgeon and patient are located in different countries. Liability becomes more complex if a procedure is performed autonomously without real-time human supervision.

Six Levels of Robotic Medical Autonomy

Yang and colleagues describe six levels of robotic medical autonomy:[5]

- Level 0: No autonomy—Human operator performs all functions.
- Level 1: Robot assistance—Human retains continuous control.
- Level 2: Task autonomy—Human has discrete control with specific tasks given to robot.
- Level 3: Conditional autonomy—Human selects autonomous strategy performed by robot.
- Level 4: High autonomy—Robot makes decisions under supervision of a human.
- Level 5: Full autonomy—Procedure performed by robot with no human supervision required.

Robot-assisted surgery has reached Level 4 (high autonomy). Level 5 (full autonomy) remains experimental. Transitioning between these levels requires rigorous oversight to ensure patient safety. The surgical community must proactively develop policies and regulations to protect patient safety as autonomous AI technologies evolve.

Surgery from the Patient's Perspective

As a surgeon with many decades of experience, I had a different perspective when I was a patient undergoing major surgery. Of course, I selected a

As AI becomes more integrated into operative care, comparable standards, safeguards, and accountability structures are essential.

surgeon who had successfully performed a great number of the procedures I would have.

The surgeon's technical excellence is important but so are communication, trust, and personal connection. The reassurance provided by direct interaction with the surgeon before and after surgery is irreplaceable. The surgeon's preoperative explanation of why the procedure would be helpful was critical. Seeing the surgeon immediately before and after the surgery was very comforting. Being able to ask questions during the surgeon's morning rounds and receive clear, precise answers was very reassuring.

However, the modern era of AI-generated, non-human answers to questions degrades the trust, comfort, and confidence in the surgeon-patient relationship. This is a fundamental change in the way surgery has been practiced, and we need to be very thoughtful as to whether this is the path that we want to go down. It would be difficult to return to the original surgeon-patient relationship once this road is taken.

Accountability, Risk, and Cybersecurity

AI-driven systems can enhance safety by identifying critical operative steps and avoiding known hazards. However, not all cases are routine. If harm occurs, responsibility becomes ambiguous. Is the surgeon accountable? The hospital? The manufacturer? The programmer? These questions must be addressed proactively rather than after an adverse event.

Cybersecurity presents an additional risk. Cyberattacks have already disrupted EHRs, billing systems, and medical equipment. Safeguards to identify and prevent such threats must be integral to AI-enabled surgical platforms.

Cost, Incentives, and Unintended Consequences

Robotic surgery offers potential benefits for patients, including shorter hospital stays and faster recovery. However, these systems carry substantial costs, often exceeding $1 million per unit, with significant annual maintenance fees.

Robotic surgery also is associated with financial incentives for surgeons. A recent report found an association between industry payments to surgeons and increased use of robotic-assisted surgery. In addition, the study found an association between higher industry payments and increased use of surgical robots. The authors of an article examining this topic suggest that surgeon-industry financial relationships may be an important contributor to the increase in robotic-assisted surgery.[6]

On the plus side, AI systems track every movement of the robot and operative time, enabling efficiency analysis and skill refinement. The benefit is that the most efficient and effective movements can be learned by and taught to surgeon operators. Yet postoperative complications and long-term outcomes are not captured. On the minus side, efficiency metrics may incentivize speed over safety. From the patient's perspective, optimal outcomes—not faster operating times—are paramount.

Recommendations for AI Integration

Integrate AI education into medical school, residency, and fellowship training

Incorporate AI into continuing medical education and certification

Establish a multidisciplinary "blue ribbon" panel—including surgeons, patients, ethicists, policymakers, engineers, AI developers, regulators, and legal experts—to develop standards and safeguards

Governance

We have seen how quickly new technology can transform human life. Take cell phones, for example. In a relatively short period of time, 10–20 years, cell phones swept onto the scene and radically changed global behavior.

Widespread adoption of new technology often comes with unforeseen consequences. The same is true with AI. Medicine must avoid a reactive approach. AI and its applications in medicine and surgery have evolved exponentially in a short period of time. The benefits of AI to the profession are significant, but clear guardrails and oversight are needed to monitor and thoughtfully address its ethical, clinical, legal, and personal impact.

It is time for a comprehensive evaluation of AI's impact on medicine and surgery. We should remember the lessons of history, specifically what transpired in the early part of the 20th century.

Improvements in surgical safety advanced through leadership and collaboration, notably through efforts led by the ACS and Joint Commission. These organizations created standards that fundamentally improved care, which are built on objective criteria that guide the practice of medicine in healthcare facilities today. A comparable effort is needed to establish guidelines and safeguards that will allow patients to benefit from the extraordinary advancements of AI while ensuring their safety.

Disclaimer

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

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ACS AMERICAN COLLEGE OF SURGEONS

Quiet Architect Helps Shape Trauma Revolution

Tyler G. Hughes, MD, FACS

A. Brent Eastman, MD, FACS, grew up as the son of a locomotive engineer in remote Wyoming.

HIS CAREER AND EXPLOITS became the stuff of legend. Yet, because Dr. Eastman is a quiet, steady presence, many of those stories remain little known.

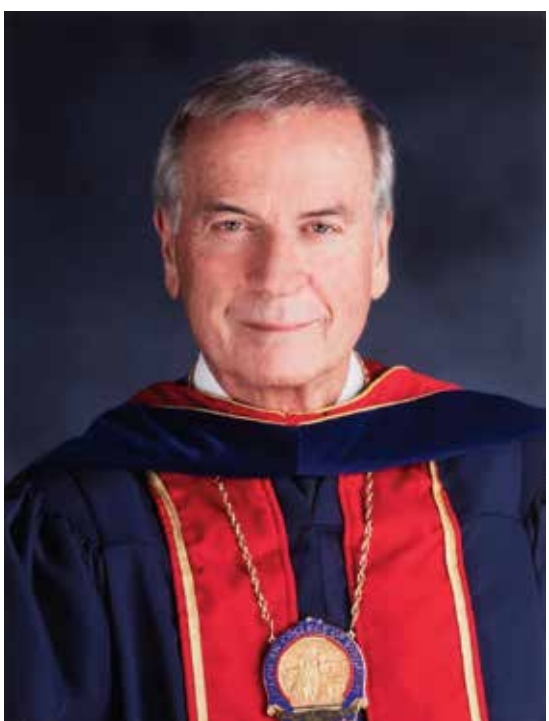
Few know that he dated one of President Lyndon Johnson's daughters or that he climbed mountains for recreation—summiting the Grand Teton at midnight during his college years.

Most surgeons familiar with recent history recognize Dr. Eastman as one of the indefatigable surgeons at San Francisco General Hospital in California who helped drive the trauma revolution of the 1960s and 1970s. His accolades include serving as Chair of the ACS Board of Regents and later as the 93rd President of the ACS.

But did you know that his first public recognition came in *Reader's Digest*? Therein lies a tale.

After working during college as a river raft guide on the Snake River in the Pacific Northwest—where he met Lady Bird Johnson and her daughter—Dr. Eastman attended the University of California San Francisco (UCSF) School of Medicine. There, he met his future wife, Sarita, who also was a medical student.

These were formative years at UCSF. Many of the leading surgeons of the day and future pioneers in trauma trained at this esteemed medical center. Dr. Eastman continued his training as a general surgery resident at San Francisco General Hospital, where J. Englebert Dunphy, MD, FACS, served as chair and F. William Blaisdell, MD, FACS, was on faculty. Future leaders such as George F. Sheldon, MD, FACS, Donald D. Trunkey, MD, FACS, Cliff Deveney, MD, FACS, and Karen Deveney, MD, FACS, also passed through this remarkable program.



Surgeons have confronted trauma-related injuries since time immemorial. It remains a leading cause of death among young people, claiming thousands of lives in the US each year. By the late 1960s, building on work from multiple centers, a systematic approach to trauma care began to take shape.

Prehospital care evolved from ambulances that often doubled as hearses to mobile intensive care units. Trauma teams emerged, and their coordinated approach would spread across the US during the next 50 years. Concepts of resuscitation became standardized. Intravenous nutrition and central venous access expanded the capabilities of modern care.

Trauma care continued to change rapidly. For example, in 1968, the artist Andy Warhol was shot multiple times at close range. This event is a landmark trauma case because it highlights the transition from rudimentary, prehospital trauma management to a modern surgical intervention. In New York City at that time, the typical sequence of events unfolded after he was shot, including transporting Warhol in a combined hearse-ambulance to the nearest hospital, where on-call surgical residents began his care.

Without detectable vital signs, he was nearly declared dead when an attending surgeon, passing through the emergency department, intervened. The surgeon opened Warhol's chest and restored enough circulation to proceed to the OR. After multiple operations, Warhol survived.

If this event is not widely remembered, it may be because later that same night Robert F. Kennedy died after being shot, pushing Warhol's case to the back pages.

Just 3 years later, when Dr. Eastman was chief resident 3,000 miles away on the West Coast, Wayne Lindblom was struck by earthmoving equipment at a construction site in San Francisco. A young Dr. Sheldon and his chief resident, Dr. Eastman, were alerted to the case. Resuscitation began immediately, and the patient was transported rapidly to the OR, where he underwent hours of surgery.

Lindblom's postoperative course was, as surgeons often euphemize, "stormy": shock, stress ulcer hemorrhage, renal failure, liver failure, subhepatic abscess, prolonged total parenteral nutrition, and dialysis. Ultimately, Lindblom survived. Dr. Eastman, meanwhile, completed his training and began practice in San Diego.

A few years later, a representative from San Francisco General Hospital contacted Dr. Eastman and suggested he obtain the January 1974 issue of *Reader's Digest*. The Lindblom family, struck by the dedication of his caregivers, had alerted the magazine to his remarkable rescue and recovery.

In the article, Drs. Sheldon and Eastman were referenced by fictitious names, as it was considered unethical at the time for physicians to publicly claim credit for their work.

And that is the story of Dr. Eastman's first "publication," as Drs. Dunphy and Blaisdell would later tease him.

Today, Dr. Eastman and his wife, pediatrician Sarita Eastman, MD, live a quiet life in the hills near San Diego, surrounded by their children and grandchildren. In the California sunlight, they reflect on poetry, music, and life in medicine.

Dr. Eastman is a living legend in trauma care and his many accomplishments exemplify surgical excellence. He helped transform the care of the injured patient, quietly and without fanfare. He is yet another ACS Fellow who has served all with skill and trust.

And if you don't believe it, you can read it in *Reader's Digest*.

Disclaimer

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Dr. Tyler Hughes *is a retired Kansas rural surgeon. Born in Texas, he trained in Dallas but spent most of his career working as a surgeon in McPherson, Kansas. In retirement, Dr. Hughes is traveling the world in search of surgeon stories.*

Note from Dr. Hughes: Talking about the "average" surgeon is like referring to an "average" astronaut. Every story is unique; there is no average. In this article series, I will feature surgeons of different specialties, backgrounds, ages, and practice types. Some of the surgeons you may know well, while others have worked in near obscurity. As surgeons, they serve all with skill and trust. If you are an ACS member and would like to meet with me to share your experiences, contact bulletin@facs.org.

Dr. Louis B. Wilson Integrated Optics, Firearms, and Pathology to Advance Medicine

Hannah S. Lee, AB
Tina Bharani, MD
Divyansh Agarwal, MD, PHD

LOUIS BLANCHARD WILSON, MD, (1866–1943) is best known for developing the frozen section technique for intraoperative diagnosis, but a lesser-known chapter of his career unfolded on a rifle range in Rochester, Minnesota, and in the photographic darkrooms of the US Army Medical Museum in Washington, DC.

Three passions—firearms, photography, and a commitment to objective data—intertwined to make Dr. Wilson a pivotal figure in the rise of scientific medicine during and after World War I (WWI). His careers in photography, pathology, and military ballistics show how the pursuit of reproducible evidence shaped both the authority of a specialty and the identity of one of its most passionate advocates.

A pioneer in medical photography at the Mayo Clinic in Rochester, Minnesota, Dr. Wilson was a gifted pathologist and photographer. Born in 1866, he spent his childhood with his grandparents in Pennsylvania, where he developed early interests in photography—building a pinhole camera with wet plates—and firearms, which he began learning to handle at the age of 6. A later biography described this as "his early developed love for guns and his appreciation of their potential as instruments of recreation and accoutrements of power."[1]

In 1894, he began working on photomicrography under Captain William M. Gray, MD, at the Army Medical Museum, where Dr. Wilson's interest in photography merged with his scientific career. He refined his photomicrographic techniques over the next 2 decades. He then served as the assistant director of the US Army Medical Museum during WWI, working primarily in ballistics and the pathology of wounds.[2] His military appointments gave him the ideal setting to unite all three of his interests: cameras, optics, and firearms.

Photography was not merely a professional tool for Dr. Wilson, but rather it was a consuming scientific interest. Those who knew him observed that his greatest interest was not photography as art but its "mathematics of optics."[2] This made photography, in his hands, a vehicle for precision rather than expression. During his service in the US Army Medical Corps during WWI, Dr. Wilson wrote to a colonel, outlining two urgent needs: "the lack of

Photography extended pathology's influence from the laboratory to the OR.

Louis Blanchard Wilson *(Credit: Bruce Fye Center in the History of Medicine, Mayo Clinic Archives)*

pathologists and the restrictions on photography" and "the job of getting the photographers properly trained in careful technical photography of tissues."[3]

The camera was a tool to be mastered, not a substitute for the trained pathologist, and Dr. Wilson made himself the authority on who was qualified to master it. Photography extended pathology's influence from the laboratory to the OR.

With photographic evidence, pathologists could share and replicate findings that previously depended on a single observer's eye under the lens. The microscope allowed pathologists to achieve higher precision in characterizing malignant features and physicians to better understand the progression of disease.[4]

In *Medicine and the Reign of Technology*, Stanley Joel Reiser describes the microscope "at the twentieth century's turn as the pre-eminent diagnostic instrument in medicine."[4] For two observers to see the same structure under the lens was incredibly difficult with sensitive instruments, and photographic documentation solved this problem of reproducibility. Photography enabled the work of pathologists to gain credibility and influence beyond the laboratory, including with members of the OR team and patients.

Part of the push toward standardization in the provision of care, including the hastened adoption of photography, was the war. In W. Bruce Fye's book *Caring for the Heart: Mayo Clinic and the Rise of Specialization*, William Mayo, MD, FACS, described how

Miniature camera for photomicrography *(Credit: Bruce Fye Center in the History of Medicine, Mayo Clinic Archives)*

"the war, as never before, has shown us how dependent we are on scientific medicine."

At a time when most established medical research institutions were located abroad, the war brought opportunities for American institutions such as the Mayo Clinic. Paired with the military backgrounds of many physicians and scientists, including Dr. Wilson, this environment accelerated the adoption of reproducible, standardized research in the hospital.

Prioritizing Pathologist Input in Surgical Decisions

Dr. Wilson is primarily remembered in medical history for developing a groundbreaking, fast method for analyzing tissue samples during surgery—a technique known as the frozen section, which was published in his 1905 landmark paper "A Method for the Rapid Preparation of Fresh Tissues for the Microscope."

Before this technique became routine, surgeons made excision decisions without knowing whether the tissue was malignant until after the procedure. Dr. Wilson's method changed the structure of surgery itself: The OR now paused for pathological consultation. He specified that the process could take "one and a half minutes" for a diagnosis in a large percentage of surgical cases, providing expectations for both the quality and speed of the procedure. The frozen section did not merely add an assessment tool to surgery. This process reorganized surgical decision-making around the pathologist's judgment.

The same commitment to precision extended to his photomicrographic work. In his published guides, Dr. Wilson described camera specifications numerically: "The shutter snaps, and an exposure of 2 to 5 seconds is given… resulting pictures are circular and 1 ⅛ inch in diameter."[4]

Mastery of the microscope, Reiser argued, required knowledge of optics, chemistry, and anatomy, and the same applied to cameras.[5] His presentation of cameras, describing their structure and quantifying the process, helped establish photography as a symbol of modernity and expertise.

Measuring Firearms with Precision

Dr. Wilson's quantitative approach extended from pathology to wound ballistics

Dr. Wilson's method changed the structure of surgery itself: The OR now paused for pathological consultation.

research, which he pursued with equal rigor during and after his military service. He built a rifle range on his property and documented bullet trajectories and wound production with the same precision he brought to photomicrography.[2]

Working with a "pencil and paper," he was methodical in measuring velocity, range, impact, and energy to evaluate firearms performance.[1,2] He sought a standardized procedure to compare firearms, with photography providing an objective eye for this goal.

A colleague later noted that "the energy with which Dr. Wilson pursued these conclusions appears to have been in sharp contrast to the lack of zeal of the Ordnance Department."[1] It was only after his death that the military eventually adopted his recommendations regarding firearms and bullet sizes.

Dr. Wilson, at times, asserted firm boundaries around what defined photographic expertise, but the moral imperative driving his work outlasted him, becoming his legacy. His work foreshadowed modern expectations of diagnostic precision, reproducibility, and interdisciplinary integration that continue to define surgical pathology today.

Hannah Lee *is an undergraduate scholar in the History of Science, Medicine & Society at Harvard University in Cambridge, MA.*

Dr. Tina Bharani *is a clinical fellow in minimally invasive surgery at The University of Iowa in Iowa City.*

Dr. Divyansh Agarwal *is a chief resident in general surgery at the Massachusetts General Hospital in Boston.*

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3. Louis B. Wilson. Personal letter to Colonel Owens. October 5, 1918. Located at: Bruce Fye Center in the History of Medicine; Louis B. Wilson Papers, Call Number: MHU-0601.
4. Reiser SJ. *Medicine and the Reign of Technology.* Cambridge, UK: Cambridge University Press; 1978.
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Member News

Lomis Is President of Macy Foundation

Kimberly D. Lomis, MD, FACS, has been named president of the Josiah Macy Jr. Foundation, the only national philanthropy solely dedicated to improving the education and training of health professionals. Dr. Lomis joins the Macy Foundation after serving as vice president for medical education innovations at the American Medical Association. She also held the roles of professor of surgery and associate dean for undergraduate medical education at Vanderbilt University School of Medicine in Nashville, Tennessee.

Prabhakaran Is Tapped to Chair Surgery at NYMC

Kartik Prabhakaran, MD, MHS, FACS, has been named The Felicien M. Steichen, MD, Chair of Surgery at New York Medical College (NYMC) in Valhalla, and chair of the Department of Surgery at Westchester Medical Center. He will assume these roles in July. Dr. Prabhakaran, a trauma surgeon, currently serves as WMCHealth Network medical director for trauma, section chief of trauma and acute care surgery, interim chief medical officer for Westchester Medical Center, and professor of surgery and vice chair of research in the Department of Surgery at NYMC.

Emami Steps In as CMO in Florida

Claudia N. Emami, MD, MBA, MPH, FACS, is chief medical officer (CMO) at Ascension Sacred Heart Emerald Coast in Miramar Beach, Florida. A board-certified pediatric surgeon, she previously served as associate CMO at Memorial Health University Medical Center in Savannah, Georgia, overseeing quality and patient safety, medical staff operations, regulatory readiness, and physician engagement.

Hayanga Leads ABCTS as President

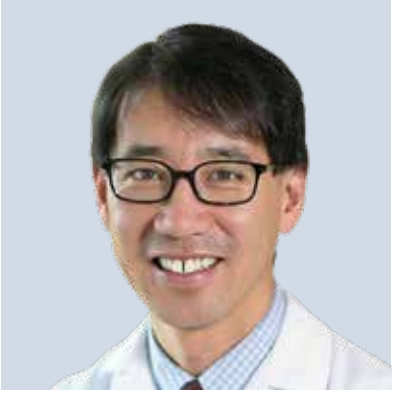
J. W. Awori Hayanga, MD, MPH, MHL, FACS, has been elected president of The Association of Black Cardiovascular & Thoracic Surgeons (ABCTS). Dr. Hayanga is vice chair of faculty and clinical affairs and a professor in the Department of Thoracic Surgery at the West Virginia University (WVU) Heart and Vascular Institute in Morgantown. He also serves as medical director of the WVU Heart and Vascular Innovation, Research, Education, and Prevention Program.

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.

Bocker Is Appointed CMO in Virginia

Jennifer Bocker, MD, MBA, FACS, is chief medical officer (CMO) for HCA Healthcare Capital Division in Richmond, Virginia. A board-certified general surgeon with specialty training in trauma surgery and head and neck surgical oncology, Dr. Bocker recently served as associate CMO for HCA Healthcare North Texas Division in Dallas, and also previously was CMO at HCA Florida Sarasota Doctors Hospital in Sarasota Springs.

Chen Receives Endowed Chair Position at Fox Chase



David Y. T. Chen, MD, FACS, was named the Carol and Louis Della Penna Chair in Urologic Oncology at Fox Chase Cancer Center in Philadelphia, Pennsylvania. He also is a professor in the Department of Urology and associate director of the Urologic Oncology Fellowship Program. Dr. Chen joined Fox Chase in 2004.

Eskandari Moves Up at Northwestern

Mark K. Eskandari, MD, FACS, was promoted to system medical director of vascular surgery in the Department of Surgery at Northwestern Medicine in Chicago, Illinois. Dr. Eskandari also is a professor of surgery, radiology, and medical education at Northwestern University Feinberg School of Medicine, and serves as system chief of vascular surgery, program director for the vascular surgery fellowship, and program director for the Vascular Surgery Scientist Training Program at Northwestern. In his new role, Dr. Eskandari will provide strategic direction for all vascular surgery divisions across the Northwestern Medicine system.

Kelley Joins CNS Pharmaceuticals

Lynne Kelley, MD, FACS, was appointed chief medical officer (CMO) at CNS Pharmaceuticals, Inc., a biopharmaceutical company specializing in the development of novel treatments for primary and metastatic cancers in the brain and central nervous system. Prior to joining CNS Pharmaceuticals, Dr. Kelley served as CMO at several public and private biotechnology and medical device companies, including TISSIUM, Servier Pharmaceuticals, X4 Pharmaceuticals, and Senseonics.

Surgeons Advance Evidence-Based Critique of Medicare Payment Reform

THE ACS HAS LONG advocated for reform of the flawed Centers for Medicare & Medicaid Services Medicare Physician Fee Schedule (MPFS), particularly in response to the agency's recent efforts to increase primary care reimbursement at the expense of specialists, including surgeons.

In a free-access *Health Affairs* article published in May, "Modernizing the Medicare Physician Fee Schedule: What Problem Are We Trying to Solve?," ACS leaders and surgeons outlined their concerns with this ongoing shift.

They argued that the "underlying thesis" of the shift—that primary care physicians are uniquely burdened by uncompensated care, with downstream effects on salaries, medical trainee interest, and public health—is misguided, noting that the evidence supporting these claims is outdated or lacking.

Because the MPFS is required to be budget-neutral, meaning increases in primary care reimbursement must be offset by decreases elsewhere, surgeons are facing recurring payment cuts despite the growing complexity of their work. At the same time, a series of policy and Current Procedural Terminology code changes has led to higher reimbursement for primary care physicians.

The authors note that achieving a sensible and equitable payment system will require a thorough evaluation of recent MPFS adjustments to address existing flaws and ensure that surgical specialty care is valued equally with primary care.

Ultimately, though, this issue is not primary versus specialty—it is about protecting the full continuum of care. Primary care is essential, but it is not a cure-all for the nation's health challenges, and patients also need ongoing access to surgeons and the lifesaving, complex care they provide.

The authors of the article include six surgeons:

- Christopher P. Childers, MD, PhD, member of the ACS General Surgery Coding and Reimbursement Committee (GSCRC)
- Christopher K. Senkowski, MD, FACS, Chair of the ACS GSCRC
- Don J. Selzer, MD, FACS, ACS Regent and Vice-Chair of the ACS GSCRC
- Charles D. Mabry, MD, FACS, member of the ACS GSCRC and Past ACS First Vice-President and Regent
- Michael J. Sutherland, MD, MBA, FACS, ACS Senior Vice President, Member Services
- Thomas C. Tsai, MD, MPH, FACS, Medical Director for Health Policy Research in the ACS Division of Advocacy and Health Policy

SurgeonsVoice American College of Surgeons Professional Association Grassroots Network

Urge Congress to Stop wRVU Cuts for Surgeons

Show your support for the Efficiency Adjustment Delay Act through SurgeonsVoice. Take 2 minutes and tell your Representative to support legislation introduced by Reps. Ron Estes (R-KS-04) and Thomas Suozzi (D-NY-03).

The stronger our voice, the better the chance that this cut that devalues surgeon services will be stopped.

The ACS will never stop fighting for you!

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The 2026 theme, "**QI Powered by AI**," reflects both the momentum and responsibility ahead. Artificial intelligence is rapidly transforming healthcare, but technology alone does not drive improvement. Meaningful quality improvement is driven by multidisciplinary teams who work together to identify gaps, examine setbacks, and learn from experience.

QSCC provides a space for surgeons, clinical leaders, quality professionals, administrators, and multidisciplinary teams to learn from peers, exchange best practices, and gain tools that immediately can be applied in practice.

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