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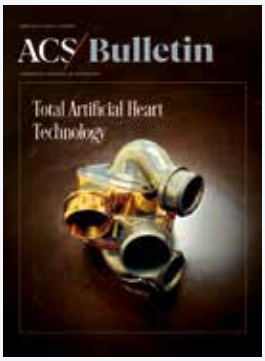

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Understanding Unionization and Proposing Standards to Improve the Workplace

Patricia L. Turner, MD, MBA, FACS
executivedirector@facs.org

IN MY FEBRUARY COLUMN, I mentioned two new and exciting ACS projects: one on workplace standards and another focused on sharing accurate information on surgeon unionization. This month, I am pleased to explain more about the vital resources we have developed. As always, our aim is to serve surgeons in every specialty—in this case, by providing information that may help improve working conditions across our profession.

Why We Need Workplace Standards

All of us value hard work. Indeed, we cannot deliver optimal results for our patients unless we sustain a strong work ethic throughout our careers. Historically, this has meant we must be constantly and individually responsible for patient care.

Over the past few decades, however, practice configurations have changed for some. While most surgeons were once self-employed, the majority now are employees of hospitals, systems, or other healthcare entities. That change has involved a reduction in autonomy, with little corresponding effort by employers, legislators, and/or regulators to offset the resulting dissatisfaction.

Articulating and Promoting Workplace Standards

The Board of Regents created the Optimal Working Environment for Surgeons Task Force in early 2025. One result of the task force's efforts is an article by a team of ACS leaders, "Developing Specialty-Specific Workplace Standards for Surgeons: A Framework to Support Sustainable Surgical Careers," which was published in the *Journal of the American College of Surgeons* on March 3.

Its purpose is to help ensure surgeons receive the benefits of standards on issues related to workload, fatigue, coverage, and resources that physicians in some other specialties (such as emergency medicine, anesthesiology, and some acute care surgery practices) already enjoy. We have articulated standards in multiple domains

based on reviews of the benchmarks available in those specialties; insights from practicing surgeons and healthcare leaders; and the literature on physician workload, burnout, fatigue, and resource allocation.

These standards include several highly specific quantitative recommendations, including formulas for calculating appropriate workload and compensation for overnight call, nuanced proposals for minimum levels for OR and clinic access, and a proposed maximum inpatient census level sensitive to patient acuity. Additionally, the framework includes qualitative recommendations on resource access, clinical support and team composition, fatigue mitigation and wellness support, and administrative burden.

Because The House of Surgery® includes numerous surgical disciplines with widely varying needs, the ACS is also collaborating closely with other surgical societies. To date, the ACS has held meetings with more than a dozen organizations. Many have expressed interest in adapting the recommendations for the groups they support and will be drafting manuscripts that reflect their nuanced requirements.

Understanding Surgeon Unionization

In December 2024, the ACS *Bulletin* published "Is It Time for Surgeons to Unionize?" by Jeremy Lewin, JD. The article discussed the feasibility of surgeons creating or joining a labor union, as well as possible scenarios for related activity in the surgical workplace. Regarding the value of labor organizing, Mr. Lewin wrote, "There is no right or wrong answer, but…it is important to gather as much information as possible to help make an informed decision."

Many surgeons found that idea compelling. In direct response to ACS members' repeated requests for more information, the Optimal Working Environment for Surgeons Task Force has worked to create resources to help ACS members understand the facts about physician unionization. These are now available via a new website hub, Understanding Surgeon Unionization, at *facs.org/unionization*. Please note that the ACS is not endorsing the union concept or creating a union; we are merely providing resources.

The work began with the knowledge that organized labor is not currently widespread among US surgeons. At present, just under 10% of all physicians in the US are unionized (a percentage on par with union membership among all US workers). As a result, the resources include an FAQ on physician unionization that begins with basic definitions and extends to surgeon-specific information not readily available elsewhere.

We have also included a bibliography offering numerous peer-reviewed academic articles examining labor organization efforts among physicians and the impact of union activities on healthcare workplace standards and patient care. Finally, the website includes details on relevant organizations, including engaged healthcare associations, unions that currently welcome physicians, and the federal agency that oversees unions, the National Labor Relations Board.

The intention of this project is not to convince any individual or institution to embrace or resist unions. Rather, we hope to provide evidence-based, objective content that helps each member of The House of Surgery understand this topic. As with all ACS efforts, the key purpose is to empower all surgeons to thoughtfully develop their own perspectives and take actions that most benefit their lives and careers.

I encourage you to read this information and the workplace standards article. Please communicate the information to your colleagues where appropriate. As always, I welcome your feedback.

Submit Your Abstract to QSCC

The ACS Quality, Safety & Cancer Conference is accepting abstract submissions until March 9. Learn more and submit at *facs.org/qscc*—and mark your calendars for the conference, which will be in Orlando, Florida, July 30–August 2.

Apply to an ACS Committee

The ACS thrives on input from our members, and the most vital contributions come from those on our committees. The ACS has many committees, spanning focus areas from cancer and trauma to ethics, education, advocacy, practice management, and artificial intelligence. This year's application for all committees will be open April 1–June 15. I strongly encourage all interested members to apply on *facs.org/committees*. We want you to engage with us.

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

With "Real Momentum," Total Artificial Heart Technology Faces Defining Chapter

Jennifer Bagley, MA

Few innovations in surgery carry the same mix of promise, controversy, and urgency as the total artificial heart.

Opposite: Dr. William Cohn, Alexis Edward Shafii, MD, FACS, and their team perform the first BiVACOR total artificial heart implantation.

FOR MORE THAN 6 DECADES, surgeons and engineers have attempted to replace the failing human heart with mechanical substitutes—often achieving short-term success, but repeatedly running into the same barriers, including hemolysis, infection, stroke, size constraints, and poor cyclic durability.

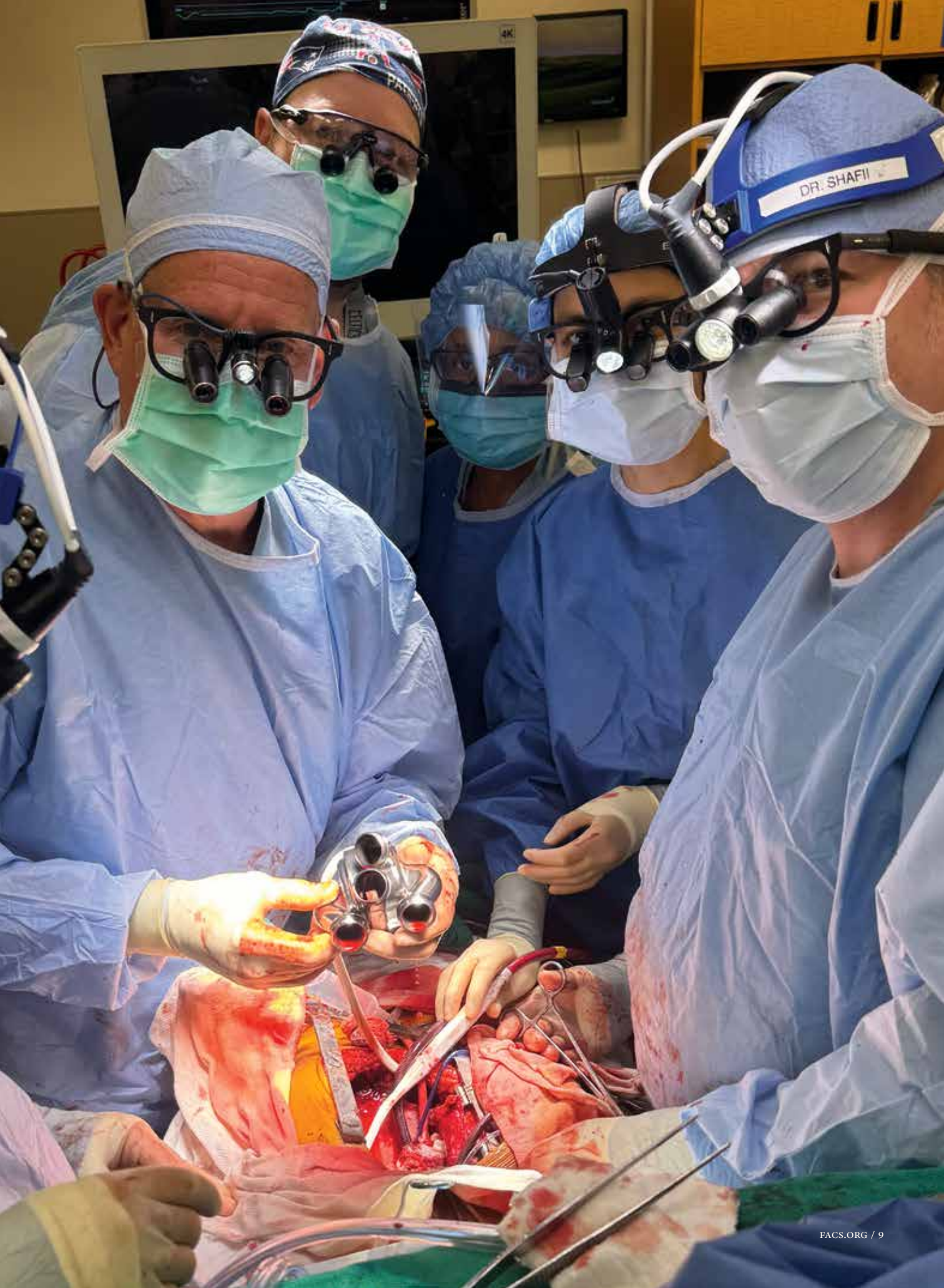
Today, however, a growing body of experimental and early clinical evidence suggests the field may be approaching a turning point. Rather than attempting to replicate the heart's pulsatile mechanics, investigators are embracing continuous-flow designs built around dramatically simplified architectures—most notably, total artificial hearts with a single, magnetically levitated rotor and no valves, membranes, or points of mechanical wear.

Early experience with these devices indicates they may be capable of doing what prior generations could not: providing stable biventricular support with sufficient durability and physiologic adaptability to move beyond short-term rescue and into the realm of longer-term—and potentially permanent—therapy for end-stage heart failure.

For William E. Cohn, MD, FACS, a cardiothoracic surgeon at The Texas Heart Institute and Baylor College of Medicine in Houston, Texas, this moment represents the culmination of decades of work at the intersection of surgery, engineering, and translational science.

His professional lineage traces directly to the origins of artificial heart research itself. Dr. Cohn trained under Michael E. DeBakey, MD, FACS, and later joined the group led by Denton A. Cooley, MD, FACS—two giants of cardiovascular surgery whose rivalry helped define Houston as the epicenter of heart surgery innovation.

In many ways, Dr. Cohn has inherited that mantle, working closely with longtime mentor O. H. "Bud" Frazier, MD, FACS, and now collaborating with biomedical engineer Daniel Timms, PhD, to pursue a radically reimagined artificial heart.


DR. SHAFII

To Dr. Cohn and many others, the lesson was clear—the problem was not artificial hearts per se, but the insistence on copying nature too closely.

Dr. Cohn framed the clinical imperative plainly. Heart failure is a global epidemic affecting at least 26 million people worldwide[1]—6.7 million adults in the US—and remains a progressive, ultimately lethal condition for many. Conservative estimates show that more than 450,000 patients die from heart failure each year in the US alone.[2] Heart transplantation, while lifesaving, cannot meet that demand.

Annual transplant volumes have continued to steadily increase over the past several decades, with roughly 4,500 donor heart transplantations performed in 2024.[3] Even among transplant recipients, though, long-term outcomes remain limited. Dr. Cohn explained that approximately half of patients are dead within 10 years, often from the downstream consequences of immune modulation, which fall into two main categories (over- or under-immunosuppression).

Against that backdrop, the appeal of a durable, shelf-ready artificial heart is obvious. "If we had a permanent artificial heart that worked," Dr. Cohn said, "it would become one of the most dramatic advances in modern medicine."

History Rooted in Houston

The modern history of artificial heart development is inseparable from Houston, where much of the earliest work unfolded in the 1960s. Those efforts were driven by bold personalities and an atmosphere that encouraged ambitious experimentation.

Dr. DeBakey, working with Argentinian engineer Domingo Liotta, pursued early artificial heart prototypes through extensive animal experimentation. The work was painstaking and technically limited by the era's primitive cardiopulmonary bypass technology; the longest-surviving animal lived only about 24 hours.

The groundbreaking innovations of Drs. Denton Cooley (left) and Michael DeBakey transformed the field of cardiovascular medicine.

Frustrated by the pace of progress, Liotta became convinced that clinical implantation was the only way forward. That conviction set the stage for one of the most dramatic episodes in surgical history. In April 1969, while Dr. DeBakey was in Washington, DC, seeking additional funding, Dr. Cooley implanted an artificial heart into a 46-year-old man with ischemic cardiomyopathy whose heart could not support separation from bypass. The patient and his wife consented to the procedure as a last resort.

The device was a marvel by the standards of its time—and crude by today's. A large bedside console, roughly the size of a small appliance, delivered bursts of compressed air through hoses exiting the patient's chest wall. Those air pulses inflated and deflated balloons inside two internal pumps. One propelled blood to the lungs and the other to the systemic circulation.

Hemodynamics were initially excellent. But the device caused severe hemolysis, rapidly destroying red blood cells and precipitating kidney failure. After 64 hours of support, the team performed an emergency heart transplant. In an era before modern immunosuppression, the patient died 32 hours later of sepsis and multisystem organ failure.

The case ignited fierce controversy. Dr. DeBakey returned to Houston furious, severing ties with Dr. Cooley and dismissing staff involved in the operation. The two men did not speak for decades, and the schism reshaped Houston's institutional landscape.

The artificial heart used in that first human implant now sits in the Smithsonian Institution, a symbol of both extraordinary ambition and the field's earliest limitations.

For Dr. Cohn, that moment was formative. He grew up in Houston during this era and remembers his mother tearing the newspaper article off the front page and placing it next to his cereal bowl. At 8 years old, he brought the article to school and attempted to explain artificial heart technology to his classmates.

"I emerged as the subject matter expert in my peer group," he joked. That moment of childhood awe foreshadowed a lifelong dedication to cardiac innovation.

A BiVACOR total artificial heart prototype is shown alongside a digital anatomical model, highlighting the compact rotary pump design.

Rethinking the Beating Heart

Despite decades of progress, nearly every total artificial heart developed over the ensuing 70 years shared a common design philosophy: mimic the native heart's pulsatility.

According to Dr. Cohn, devices used pusher plates, flexible membranes, and mechanical valves to reproduce systole and diastole. Clinically, many of these systems achieved their intended purpose—keeping patients alive long enough to receive a transplant with a donor human heart. But mechanically, they all faced the same unsparing reality.

The arithmetic of cardiac motion is brutal. A heart beating 100 times per minute performs roughly 144,000 cycles per day—more than 50 million per year. No manmade system with multiple moving parts undergoing cyclic deformation can reliably withstand that workload indefinitely. Mechanical fatigue, membrane failure, valve wear, and bearing degradation are inevitable over time. As a result, total artificial hearts remained, by necessity, temporary devices.

The clearest example is the CardioWest total artificial heart, a descendant of early Jarvik-7 era technology. Since its earliest iterations in the 1980s, nearly 2,000 patients, most on the brink of death, have received versions of this device. The most recent embodiment, the SynCardia temporary Total Artificial Heart, was approved by the US Food and Drug Administration (FDA) in 2004 for clinical use as a bridge to heart transplantation. To date, it remains the only artificial heart approved in the US.

A pivotal 10-year clinical study published in *The New England Journal of Medicine* found that 79% of patients who received the SynCardia device survived to transplantation, compared to only 46% in a control group.[4] Yet the limitations are well-known.

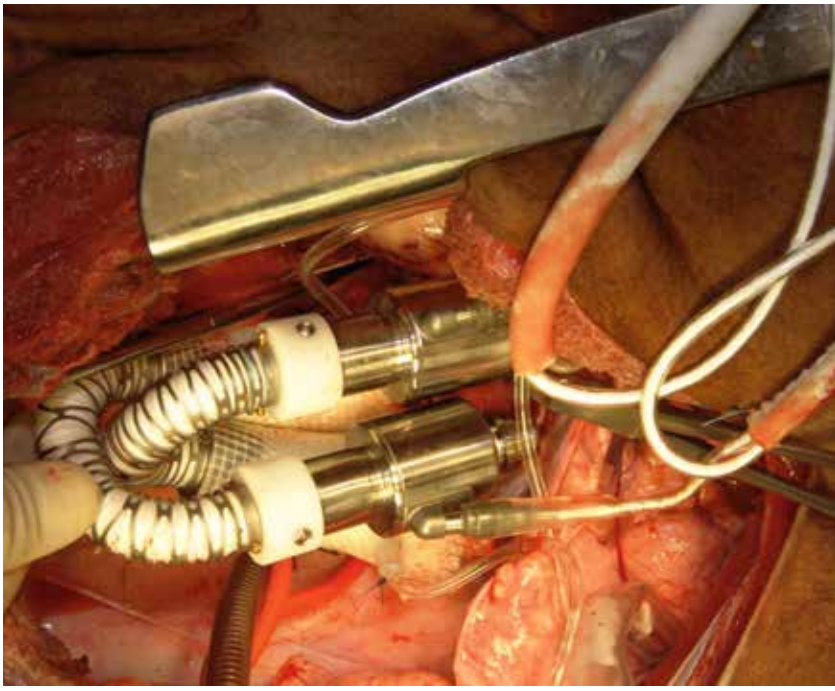
Early versions required patients to remain tethered to a massive external console. Although a newer portable driver allows discharge from the hospital, the system still relies on a pair of pneumatic hoses traversing the chest wall—major liabilities for infection. Stroke risk remains high, and when key components fail, the outcome can be fatal. Average support duration remains measured in months, not years.

To Dr. Cohn and many others, the lesson was clear—the problem was not artificial hearts per se, but the insistence on copying nature too closely. "We never built an airplane with flapping wings," he said. "Maybe we shouldn't be trying to build a beating heart."

Continuous-Flow Revolution

That insight already had transformed another corner of the field. Beginning in the 1980s and accelerating in the 1990s and early 2000s, ventricular assist devices (VAD) evolved away from pulsatile designs toward continuous-flow pumps built around rapidly spinning impellers. Early concepts were unpolished and often impractical, but they proved a fundamental point: blood could be pumped effectively and safely using rotary flow.

The maturation of VAD technology changed everything. Devices such as the HeartMate II demonstrated that continuous-flow pumps could be small, quiet, energy efficient, and—most



An early version of the twin-turbine, rotary total artificial heart was implanted in a calf to test durability and function.

importantly—longer lasting. Tens of thousands of patients worldwide received these devices, and long-term survivors began to accumulate. Some patients lived more than a decade or two on a single pump.

Nearly all pulsatile VADs disappeared from clinical use, replaced by newer generations of continuous-flow devices with magnetically or hydrodynamically levitated rotors.

The implications were unavoidable, Dr. Cohn shared. If continuous-flow pumps could support one ventricle for years, why not two?

Extending Continuous Flow to Total Heart Replacement

Early efforts to answer that question involved replacing the excised heart with two independent continuous-flow pumps—one for the systemic circulation and one for the pulmonary circulation.

Over roughly 8.5 years, Dr. Cohn, Dr. Frazier, and a team of collaborators implanted such systems in 68 large-animal models. These experiments were technically demanding and often unforgiving. Only 30 animals survived longer than 1 week, and infections were common.

Yet the experiments yielded critical insights. Contrary to long-standing concern, balancing right- and left-sided flows was not the dominant challenge. Continuous-flow pumps exhibit intrinsic automaticity. As inflow pressure rises, flow increases without a change in revolutions per minute, mimicking a Starling-like response. Thus, many animals maintained stable hemodynamics without constant adjustment.

The major Achilles' heel was ingested thrombus on the right side. Small venous clots—subclinical pulmonary emboli that mammals generate routinely—could lodge in tight-clearance turbines and abruptly halt flow. That observation drove the next design leap: reducing complexity even further.

Single Rotor, Levitated in Space

The pivotal shift came with the arrival of Dr. Timms from Australia. Motivated by his father's death from heart failure, Dr. Timms had independently conceived of a titanium-constructed total artificial heart built around a single, double-sided impeller capable of pumping blood to both circulations. The rotor would be magnetically levitated—held in space by electromagnets responding to high-frequency sensor feedback—eliminating physical contact, bearings, and mechanical wear. In addition, the right-sided impeller was designed to allow thrombus to pass without affecting right pump function.

"It's like science fiction," Dr. Cohn said. "There's no mechanical wear. The rotor never touches anything. There's no reason it shouldn't last indefinitely."

When Drs. Cohn and Frazier heard the concept articulated, they recognized its potential, and Dr. Timms, who is now the founder and chief technology officer of BiVACOR, arrived in Houston. They committed fully to the new architecture.

"Big projects have humble beginnings," shared Dr. Cohn, BiVACOR chief medical officer. "And when you meet someone brilliant who is working on something that excites you, don't let them leave your side."

What followed was an intense period of digital design and rapid prototyping. Using computer modeling and 3D printing, the team produced dozens of impeller and volute geometries, testing each variant on the bench. Subtle changes in shape produced dramatic differences in flow efficiency, shear stress, and thrombogenic potential.

Dr. Daniel Timms invented the world's first durable total artificial heart, which is currently being tested for trials in patients.

Using magnetic levitation technology, the same principle used in high-speed trains, the product features a unique pump design with a single moving part.

Computational fluid dynamics informed the process, but bench testing with real blood remained the definitive arbiter. Models often failed to predict critical real-world behaviors.

Once geometry was optimized, the team transitioned to metal prototypes using additive manufacturing. Titanium pumps emerged layer by layer from laser sintering machines, then were polished and implanted in animals. Outcomes improved steadily.

After approximately 40 successful implants, regulators required five consecutive animals to survive 30 days. The team met that benchmark, clearing the way for first-in-human experience.

According to BiVACOR, the size of the total artificial heart is suitable for most men and women (body surface area >1.4 m^2). Despite its small size, the total artificial heart can provide enough cardiac output for an adult male who is exercising. Using magnetic levitation technology, the same principle used in high-speed trains, the product features a unique pump design with a single moving part. A magnetically suspended dual-sided rotor with left and right vanes positioned within two separate pump chambers forms a double-sided centrifugal impeller that moves blood from the respective pump chambers to the pulmonary and systemic circulations.[5]

The total artificial heart has no valves or flexing ventricle chambers, with magnetic levitation and motor control making pulsatile outflow possible by rapidly modulating the rotor's rotational speed once per second. The noncontact suspension of the rotor is designed to eliminate the potential for mechanical wear and provide large blood gaps that minimize blood trauma, offering a durable, reliable, and biocompatible heart replacement. A small external controller, combined with a rechargeable battery system, supports untethered operation from an AC power source to enhance patient mobility and freedom of movement.[6]

Early Clinical Experience—and Hard Lessons

Under an FDA early feasibility framework, four US centers with deep artificial heart and transplant expertise were activated. The cohort of five patients all suffered from severe biventricular failure and faced imminent death. Several were supported preoperatively with temporary devices and were deteriorating from right-sided failure.

"One patient told us, 'I don't have a heart, literally, and I have not felt this good in I don't know how long.'"

Dr. William Cohn

The first candidate in the study was a 58-year-old man who had suffered from end-stage heart failure. Surgeons at The Texas Heart Institute, including Drs. Cohn and Frazier, successfully implanted the total artificial heart in the patient. The device helped him maintain normal vital signs and organ function for 8 days—until he received a lifesaving heart transplant. The device was tested in four additional patients as well.[7]

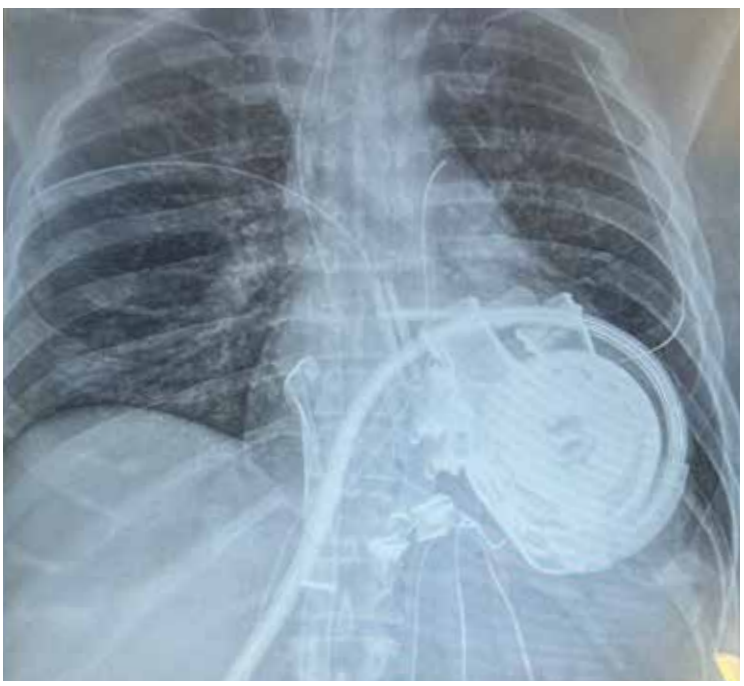
Post-implantation, recovery was striking. Patients were mobilized early, walking in hallways within days. One patient walked nearly 2 miles per day. Cardiac output increased autonomously with exertion, without manual pump adjustments. By modulating pump speed, clinicians were able to generate a palpable arterial pulse—sometimes referred to as "digital pulse"—allowing conventional blood pressure cuffs and pulse oximetry to function normally.

"One patient told us, 'I don't have a heart, literally, and I have not felt this good in I don't know how long,'" Dr. Cohn said.

Because of trial design, US patients remained in the ICU and were rapidly relisted for transplant, resulting in relatively short support durations. While the study was originally designed to include five patients, an additional 15 patients were added in late 2024. Those patients are expected to receive their devices in the months ahead.

In mid-2025, the titanium total artificial heart received the FDA's Breakthrough Device designation—a formal identification that a device in development should be expedited for patient access.

"This is more than a regulatory milestone. It's a validation of a concept we've spent decades proving that a fully implantable, total artificial heart isn't just possible, it's necessary," Dr. Timms said in a statement.[8] "The early results from our clinical trial show that we can give them a second chance, without the compromises of older technologies. The Breakthrough Device designation puts us on a faster track to deliver exactly that."



A postoperative chest x-ray shows an implanted BiVACOR total artificial heart and its driveline connections.

Parallel experience in Australia allowed discharge home; one patient lived more than 100 days with the device before transplantation.

Not all outcomes were favorable, though. Two later patients in Australia died from intracranial hemorrhage several weeks after implantation. Independent review determined the events were not device-related, implicating blood pressure and anticoagulation management, but the losses were devastating nonetheless. For Dr. Cohn, they underscored that novel devices demand not only engineering excellence, but also rigorous clinical protocols and constant refinement.

The surgical team at The Texas Heart Institute works with Dr. William Cohn to prepare for a total artificial heart implant.

Toward Destination Therapy

Despite setbacks, momentum continues. Power requirements for the device are dramatically lower than prior total artificial hearts—on the order of one watt per liter per minute of flow—making transcutaneous energy transfer via inductive coupling increasingly feasible. Ongoing miniaturization already has moved most computing capability into the device itself, with future generations aiming to eliminate external drivelines entirely.

The ultimate ambition is not simply to bridge patients to transplant, but to offer a viable alternative. For the hundreds of thousands of patients with end-stage heart failure who will never receive a donor heart, a small, durable, energy-efficient and blood-friendly artificial heart could redefine the standard of care.

"Our goal is not to be a bridge to transplant. We think this device could possibly be better than heart transplant and become the gold standard," said Dr. Cohn.

The journey also has carried symbolic weight for Dr. Cohn. Decades after the falling-out between Dr. DeBakey and Dr. Cooley, both men ultimately stood together at the bedside of an experimental implant, reconciled by the very technology that once divided them—a moment Dr. Cohn described as a reminder that high-stakes innovation can shape not only technology, but institutions and relationships as well, while also a signal that the long pursuit of a total artificial heart is finally approaching its most consequential chapter.

"With breakthrough status in hand," said Dr. Cohn, "we're entering the next phase with the wind at our backs and real momentum to bring this to more patients."

Dr. Cohn delivered the I. S. Ravdin Lecture in the Basic and Surgical Sciences, "The Past, Present, and Future of the Total Artificial Heart: A Very Houston-Centric Story," at the 2025 ACS Clinical Congress in Chicago, Illinois. This presentation was featured in episode 68 of *The House of Surgery*® podcast. B

Jennifer Bagley *is Editor-in-Chief of the* Bulletin *and Senior Manager in the ACS Division of Integrated Communications in Chicago, IL.*

Listen to *The House of Surgery* episode.

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Pancreatic Cancer Treatment Is Changing for the Better

M. Sophia Newman, MPH

For some time, surgical oncology has been in the midst of sweeping change. Pancreatic cancer may finally be reaping the benefits.

IN ADDITION TO being one of the first specialties to embrace artificial intelligence, oncology has seen numerous advances in surgical techniques, adjuvant and neoadjuvant therapy, and immunotherapy in recent years. In part, these advancements present some challenges, as surgical oncologists now routinely debate which therapies should be given to specific kinds of patients and in which order; however, many cancer types have established important improvements to disease control, cure, and survival.

In some ways, pancreatic cancer has stood apart from this milieu of improvement. While mortality caused by many major cancers has declined by approximately 2% per year since 2000, the mortality rate of pancreatic ductal adenocarcinoma (PDAC) has risen in that timeframe.[1] Outcomes vary widely between high- and low-income countries for most cancer types, while pancreatic cancer has equally poor outcomes worldwide[1]—suggesting that access to the most innovative, expensive treatments available may do little to ease the disease's toll.

After pioneering surgeon Allen O. Whipple, MD, FACS (1881–1963), created his eponymous surgery for pancreatic disease in 1935, one of his first few patients lived for 24 months before dying of liver metastases. That survival time is nearly equal to the 25-month median survival time today[2] for patients with PDAC, which constitutes 90% of all pancreatic cancer cases.

In the face of this difficulty, surgeons and scientists persist in developing innovative pancreatic cancer treatments. In recent years, they have made strides forward in understanding the usefulness of the Whipple procedure (also known as pancreaticoduodenectomy), completing that operation robotically, and averting pancreatic cancer recurrence via cancer vaccines.

Examining Usefulness of PDAC Therapies

As with other cancer types, understanding the most effective treatment options for PDAC is an active area of research.

A Panel Session at ACS Clinical Congress 2025 on biological criteria for PDAC resectability featured hepatopancreatobiliary (HPB) surgeons from Italy, Germany, Japan, and the US detailing surgical and nonsurgical care options; most noted the absence of international consensus on the optimal approach.

"We do not know what we are doing at the moment—which patient for which therapy," summarized Professor Thilo Hackert, MD, chairman of the Department of General, Visceral, and Thoracic Surgery at the University Medical Center Hamburg-Eppendorf in Germany, after presenting evidence from randomized clinical trials on radiation, chemotherapy, and combined regimens.

Dr. Hackert did, however, reinforce the common view on resection: "When no resection is achieved, that's much worse. That's not new."

If not new, resection's potential benefits are still occasionally surprising. For example, a November 2025 *Journal of the American College of Surgeons* article by Anteby and colleagues[3] examined the survival times after surgery alone in patients with PDAC for whom no multimodal care was planned. Using data from the ACS National Cancer Database®, they examined patients with stage I or II disease who either underwent or refused surgery. Among 471 well-balanced pairs, surgery was found to increase overall survival time to 14.09 months, compared with 6.34 months for those who had no operation. The study showed that resection alone, without further care, can have meaningful impact. However, the authors also found that patients with residual disease (non-R0 status) after resection experienced no survival benefit over those who refused surgery—establishing that patient selection is critical for effective outcomes.

Robotic Whipple

John L. Cameron, MD, FACS, who is the Alfred Blalock Distinguished Service Professor of Surgery at the Johns Hopkins School of Medicine in Baltimore, Maryland, and an ACS Past President (2008–2009), spent a lifetime refining the Whipple procedure. Over a long career, he completed more than 2,000 of these challenging operations and played a crucial role in lowering the procedure's mortality rate. For this work, he was the 2025 recipient of the ACS Wangensteen Scientific Forum Award.

> "People frequently ask me, 'How many Whipples do you have to do before you feel comfortable and know how to do the operation?' My answer is always the same: 'I'll let you know when I get there.'"
>
> Dr. John Cameron

In a 2017 speech,[4] Dr. Cameron, then 80 years old, made it clear exactly how tough the work is: "People frequently ask me, 'How many Whipples do you have to do before you feel comfortable and know how to do the operation?' My answer is always the same: 'I'll let you know when I get there.'"

Greg C. Wilson, MD, FACS, associate professor of clinical surgery at the University of Cincinnati College of Medicine in Ohio, is part of the next wave of improvement in the Whipple procedure—and he, too, is cautious about the operation's steep learning curve. (Read more about Dr. Wilson in the September 2024 issue of the ACS *Bulletin*.)

Dr. Wilson's career has tracked the rise of the robotic Whipple procedure. After a fellowship focused on the robotic Whipple procedure at the University of Pittsburgh Medical Center in Pennsylvania, he initiated robotic pancreatic surgery at the University of Cincinnati.

"Prior to my arrival, there was essentially no pancreatic surgery being done with a robotic approach, so I started the robotic program for pancreatic malignancies and benign conditions," he said.

Dr. Wilson now performs 15 to 20 robotic Whipple procedures per year, which is 30% to 40% of all Whipple procedures done at his center. It is a rate far higher than the roughly 10% of all pancreatoduodenectomies completed robotically nationwide.[5]

In Dr. Wilson's view, the robotic approach is a substantial step forward from the laparoscopic approach—equivalent to the quality of the still-dominant open procedure (which Dr. Cameron used for many of his Whipple surgeries).

"When I'm doing the robotic approach or an open approach, the surgery's the exact same. There are no differences in how I do the dissection. There's no difference in how I do the reconstruction; it's almost identical," Dr. Wilson explained. "I think the ability to do that is why the robotic approach has kind of become the main minimally invasive approach for this operation, and why it's the one that is expanding in use."

In contrast, the efficacy of the laparoscopic Whipple procedure can be somewhat inhibited by the instruments, which are mounted on straight sticks and limited to rotation and open-close movements.

"When you're trying to do an intricate anastomosis using very fine suture, doing that is much more challenging," Dr. Wilson said. "With the robotic approach, you have the ability to see and alter your angle and really throw the suture at any angle you'd like to take. It allows you to be much more precise, and it's a much easier skill set to attain than trying to do it laparoscopically."

However, the selection of patients for robotic Whipples remains essential, he said. His approach focuses primarily on anatomic characteristics, including vasculature, to accommodate one element

that the robotic procedure cannot replicate from the open procedure: haptic feedback, including the ability of finding arteries by feeling for a pulse. Careful attention to imaging and clinical findings is essential.

Objective evidence from a December 2025 *Annals of Surgery* study comparing open, laparoscopic, and robotic pancreaticoduodenectomies via national data from Japan[6] showed the value of the robotic procedure also includes better patient outcomes.

Although just 2.5% of the 46,166 total cases were performed robotically (1,337; compared with 20,898 performed via an open method and 1,378 performed laparoscopically), the robotic procedure was associated with lower odds of severe postoperative complications than open (odds ratio, 0.82 [95% CI, 0.68-0.98]) and laparoscopic (odds ratio, 0.78 [95% CI, 0.64-0.95]) surgery.[6]

Significant reductions also were found in postoperative pancreatic fistula, major blood loss, and length of stay. All benefits occurred despite the robotic procedures taking an average of 10 hours, far longer than the dominant open procedure (which averaged 7 hours).[6]

Dr. Wilson is working to better understand some of the same outcomes by investigating whether the open procedure, with larger incisions but a shorter OR time, or robotic surgery with minimized incision but longer OR time has better outcomes in elderly patients.

Additionally, Dr. Wilson cautioned against attempting to move toward the robotic Whipple too quickly. "There's a lot of media coverage about the robotic Whipple, and it kind of becomes a marketing tool," Dr. Wilson said. "I think it sometimes forces people to adopt that approach sooner than they may be ready for it. That's the one thing I worry about."

Preventing Recurrence via Cancer Vaccines

Of course, even the most adept pancreatoduodenectomy often does not ensure a cure. "The current treatments for pancreatic cancer, which include surgery, chemotherapy, and radiation, are largely ineffective, despite how much progress we have made with the Whipple procedure," said Vinod P. Balachandran, MD, FACS, an HPB surgeon-scientist, and director of The Olayan Center for Cancer Vaccines at Memorial Sloan Kettering Cancer Center in New York, New York.

Typical survival rates for PDAC are only about 25% after 5 years, even in resected patients. These low rates are attributed in large part to the disease's tendency to develop micro-metastases early, which seed disease recurrence and cannot be fully ameliorated by surgery. Patients who are imaging-negative for disease after surgery often nonetheless show residual disease via circulating tumor DNA. Despite the rise of neoadjuvant and adjuvant FOLFIRINOX (folinic acid, fluorouracil, irinotecan, and oxaliplatin in combination), gemcitabine-based

> "All of this evidence was indicating that if you can generate an immune response to PDAC, that maybe you could improve outcomes. So, could we induce it in other patients where it's not happening naturally?"
>
> Dr. Vinod Balachandran

regimens, and other options, complete response and long-term control remain rare.

Notably, most immunological approaches to pancreatic cancer treatment also have proven to be ineffective. This reality is thought to be attributable to pancreatic cancer biology, which includes a desmoplastic stroma that blocks immune cell infiltration to the tumor. This form of cancer also features few mutations and thus few neoantigens, which are the targets of immunotherapies. Furthermore, pancreatic cancer features a highly immunosuppressive microenvironment.

Despite these treatment limitations, meaningful improvement may be on the horizon.

"The most striking difference in these rare survivors of PDAC," he said, referring to the 10% of patients who experience long-term survival after surgery, "is that their immune systems spontaneously are able to generate an immune response to their cancer. We found this immune response not only occurs in their primary tumor but persists in their blood for over a decade, which was really quite striking."

These findings upended an assumption, Dr. Balachandran said, that "PDACs are essentially not seen by the immune system."

After publishing analyses of long-term survivors' immune responses,[7] Dr. Balachandran began working to help the 90% of patients who do not experience spontaneous disease control.

"All of this evidence was indicating that if you can generate an immune response to PDAC, that maybe you could improve outcomes," he explained. "So, could we induce it in other patients where it's not happening naturally? The best way to target the immune system is with a vaccine, but we need to know what the immune system is recognizing in the tumor."

Genetic analysis of long-term survivors led to the discovery that each person's immune system responded to unique neoantigens, rather than ones common to the full cohort. With this in mind, Dr. Balachandran and collaborators launched a phase I trial in which patients undergoing surgery had their resected tissue subjected to genetic analysis for the creation of a bespoke mRNA vaccine containing up to 20 major histocompatibility class I and II restricted neoantigens. A company in Germany assisted researchers with genetic analysis and vaccine manufacture.

The resulting study, published in 2023, examined 16 patients who received the personalized vaccines, termed autogene cevumeran, alongside a regimen of the immune checkpoint inhibitor atezolizumab and mFOLFIRINOX.[8] Eight patients had an immune response to the vaccine; by the 3-year follow-up, their median recurrence-free survival time had not yet been reached. In contrast, eight nonresponding patients had recurrence-free survival of 13.4 months.[9] In responders, vaccines induce a strong, long-lasting, functional CD8+ T cell immune response that correlated with delayed recurrence.

Currently, Drs. Pant and Balachandran are both conducting phase II trials to test for possible survival benefits among vaccinated pancreatic cancer patients.

While the benefits may be considerable, Dr. Balachandran admits the patient population to be limited, at least for now, to resected patients.

"One current understanding is that hosts are optimally fit in the post-resected state," he said. "This does not mean that there could not be other ways to teach the immune system to recognize tumors in other clinical scenarios. There could be—and I believe ongoing research, including clinical trials of personalized and off-the-shelf approaches, will help reveal what it takes for a cancer vaccine to trigger a meaningful immune response."

One alternative approach to producing a cancer vaccine may be found in additional efforts to generate a vaccine for PDAC. Roughly 90% of pancreatic cancers include mutations to KRAS, a proto-oncogene that becomes locked "on," endlessly generating KRAS proteins in tumors. Although previously thought to be undruggable, some specific mutations are now considered susceptible to emerging chemotherapy options. A team at The University of Texas MD Anderson Cancer Center in Houston is investigating a KRAS-targeted cancer vaccine.

"It's truly the Achilles' heel of the tumor," explained Shubham Pant, MD, MBBS, who is a gastrointestinal medical oncologist in the Division of Cancer Medicine at MD Anderson and a leader of this research.

The aim is not only to develop an off-the-shelf vaccine for pancreatic cancer, Dr. Pant said. It also is to learn from past efforts by shifting focus away from stage IV disease, when the tough stroma surrounding large metastases can make vaccines and other therapies ineffective, to the point when only micro-metastases exist.

"Our thought was that these cells, which do not have that protective desmoplastic stroma, might be more easily targetable with vaccines," he said.

Dr. Pant and colleagues recently completed a phase I trial of 25 patients (20 with pancreatic cancer and five with colorectal cancer), who had at least one of two mutant alleles of KRAS, G12D and G12R, and were positive for circulating tumor DNA after undergoing resection and adjuvant therapy.[10] In addition to establishing safety and tolerance, the trial found that the patients "tended to do better, even through long-term follow-up—and interestingly, in pancreatic cancer, the patients who had an increased, more robust immune response tended to do better than the patients who did not."

Currently, Drs. Pant and Balachandran are both conducting phase II trials to test for possible survival benefits among vaccinated pancreatic cancer patients. Dr. Pant and colleagues are exploring a new version of the KRAS cancer vaccine, targeting seven mutant alleles rather than two. Dr. Balachandran and collaborators are completing a multicenter trial (including enrolling patients at Dr. Wilson's hospital in Cincinnati) that will further test bespoke vaccines. Although neither is ready to share results, both are

hopeful, with Dr. Pant predicting a vaccine may be available as soon as 2028.

Dr. Balachandran is remarkably enthusiastic about the potential for developing a cancer vaccine.

"You can generate a really strong immune response in the toughest cancer, where no immune therapy has worked, and where it was thought that nothing could work," he said. "If you could do it in pancreas cancer, you should be able to do it in many of the other cancer types that are like pancreas cancer. Here, essentially, this encompasses all human cancer." B

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Dr. Gosain conducts a follow-up assessment with a patient. *(Credit: Cece Rooney, UVA Health)*

ACS Award Helps Pioneer Treatment for Congenital Colorectal Disease

Tony Peregrin

Dr. Gosain and a colleague perform a surgical repair on a patient with Hirschsprung disease. *(Credit: Cece Rooney, UVA Health)*

THE RECIPIENT of the 2015–2020 George H. A. Clowes Jr., MD, FACS, Memorial Research Career Development Award—Ankush Gosain, MD, PhD, MBA, FACS—often begins his presentations on the treatment of infants born with Hirschsprung disease by referencing the iconic children's book *Everyone Poops* by Taro Gomi.

"In the book, there's a boy who doesn't want to potty train, and the parents are telling him that everyone poops," explained Dr. Gosain, surgeon-in-chief at the University of Virginia (UVA) Health Children's Hospital in Charlottesville and the C. Bruce Morton Professor of Surgery and chief of the UVA Division of Pediatric Surgery. "But that's actually not true. Babies who are born with Hirschsprung disease—a disorder of the enteric nervous system also known as the brain of our gut—can't poop."

Dr. Gosain is a pediatric surgeon-scientist whose research, which aims to bridge basic and translational science, focuses on the enteric nervous system and gastrointestinal mucosal immune development, particularly in relation to congenital colorectal diseases like Hirschsprung disease.

With Hirschsprung disease, the infant is born without ganglion cells in part of their colon, causing a functional blockage that prevents normal stool passage, leading to severe constipation and bowel obstruction. The treatment for this condition is surgery to remove the aganglionic bowel segment.

"When I was nearing the end of my pediatric surgery fellowship, I was taking care of babies with Hirschsprung disease," said Dr. Gosain. "One of the problems with this congenital condition is it can have a dramatic presentation. They come in with a life-threatening complication called Hirschsprung-associated enterocolitis (HAEC), where their bellies are big and distended, and they're vomiting, have diarrhea, and are on death's door. If you don't make the correct diagnosis, it has the potential to go the wrong way."

HAEC impacts 30%-60% of infants with the disease and is the leading cause of death among these patients.

Dr. Gosain received the Clowes Award for his pioneering work studying the enteric nervous system and gastrointestinal mucosal immune development and function as they relate to

> "I think anytime you receive an award from the ACS, it is a major stamp of approval and an affirmation that the work you're doing has an important impact on our patients and our profession."
>
> Dr. Ankush Gosain

congenital colorectal disease, specifically Hirschsprung disease.

"Getting the Clowes Award was a truly memorable time in my career," said Dr. Gosain, an ACS Fellow since 2012. "I think anytime you receive an award from the ACS, it is a major stamp of approval and an affirmation that the work you're doing has an important impact on our patients and our profession."

The Clowes Award—which is supported through contributions to the ACS Foundation with funding from The Clowes Fund, Inc.—is intended to support the research of a promising young surgical investigator and offers a stipend of $45,000 for each of 5 years.

Dr. Gosain learned he would be receiving the Clowes Award in spring 2015, after being recruited to The University of Tennessee Health Science Center in Memphis, as an associate professor of surgery and pediatrics.

"The Clowes Award came at a time when my startup funds were starting to dwindle, and it really provided extra support that was necessary to keep a lot of my work going," he said, noting that such supplemental funding can help cover salary gaps that can result from receiving a National Institutes of Health (NIH) grant, which mandates a statutory salary limit.

According to Dr. Gosain, the difference between the actual salary and the capped amount is typically absorbed by the institution, often via departmental cost-sharing. "NIH funding is unsustainable for most academic departments of surgery, so having additional sources of funding from nonfederal sources like the ACS helps surgeon-scientists pursue their work."

For Dr. Gosain, this work focused on exploring offshoots of research data outside the scope of the NIH grant that led to newer or tangential lines of investigation, culminating in his first Research Project Grant in April 2020, commonly known as an R01 grant, of more than $2 million for his project "Dysbiosis in Hirschsprung-Associated Enterocolitis Pathogenesis."[1]

Specifically, the aim of this research project was to determine a causative relationship between dysbiosis and HAEC and identify which bacteria lead to the development of HAEC.

"We would operate on these children, and they would get better, but then they'd come back after surgery with the same problem happening over and over again—as if we hadn't done the right operation for them," explained Dr. Gosain. "This got me thinking that, for this disease process, there must be some kind of interaction happening in the gut. We have this brain of the gut, the enteric nerve system, and maybe that system is 'talking' with the gut mucosal immune system and influencing how it functions. I decided I was going to tackle this problem because it was really frustrating to me as a surgeon, not to mention to the patients and their families."

Access related video content online.

Dr. Gosain's lab, founded in 2010, is the only NIH-funded lab in the country to specifically study HAEC.

Using a mouse model, Dr. Gosain conducted a fecal microbiota transplant to confirm that overall decreased diversity of bacteria in the gut can drive the development of Hirschsprung-associated enterocolitis.

"The grant that we had been awarded previously allowed us to focus on the mucosal immune system and lymphocytes B cells in particular. What we were finding was that our mice and the immune system findings weren't enough to explain why these patients were getting sick," he said. "At the time, the field of research into the microbiome was just starting to skyrocket—and we quickly realized that these microbiome studies were costly. Funding from the Clowes Award helped support some of that work and helped us define that, yes, this is a major part of how this disease develops and progresses. That finding then became the focus of that first R01 regarding how the microbiome impacts the pathogenesis of HAEC."

Dr. Gosain's lab, founded in 2010, is the only NIH-funded lab in the country to specifically study HAEC.[1]

"We had always thought about Hirschsprung disease as a black-or-white disease—that you have the enteric nervous system in part of the gut, and you don't have it in this other part of the gut. If you take out that part of the gut that doesn't have the enteric nervous system—all the problems should be solved. The clinical findings show that's not the case," he said. "These children continue to struggle, at least half of them do. We thought maybe the enteric nervous system that is present isn't normal. Our lab was the first to define that in mice—and then our group and others—defined that as well in patients via their resection samples from their surgeries."

In 2021, Dr. Gosain and colleagues published a paper in *Pediatric Surgery International,* "Resection Margin Histology May Predict Intermediate-Term Outcomes in Children with Rectosigmoid Hirschsprung Disease."[2] The study, which cites funding from the Clowes Award, NIH, and other sources, examined patient pathology specimens as well as the results of quality-of-life surveys administered to children and their families 3 to 5 years after surgery.

"We found that the more abnormal the histology was, the poorer the quality of life was for the child, which changed how we counsel patients and families about what to expect after surgery," Dr. Gosain said. "It also opened up this new area that's a potential target for therapy, which has become a lot of the work the Gosain Lab is doing now—namely, how do we augment the function of the enteric nerve system and immunity in those kids who have had their surgeries already?"

ACS Traveling Fellowship to Germany

As the 2019 recipient of the ACS Traveling Fellowship to Germany, Dr. Gosain was provided with the opportunity to attend the German Society of Surgery annual conference in Munich, which is a forum for interdisciplinary

Dr. Gosain's ongoing research focuses on the diagnosis and management of HAEC. *(Credit: Cece Rooney, UVA Health)*

exchange of research and best practices. He also attended a meeting of the ACS Germany Chapter and visited medical centers in Berlin, Mainz, and other cities.

The ACS International Relations Committee selects an ACS Fellow for this opportunity, which awards $10,000 (US dollars) to cover travel, lodging, and other expenses.

"The ACS Traveling Fellowship to Germany helped grow my professional network outside of the US," explained Dr. Gosain. "During that time, and after the fellowship ended, I had the opportunity to speak with a lot of pediatric surgeons about the challenges we were facing. Many of them were not basic or transformational scientists like myself—but we were all talking about the fundamental clinical diagnostic dilemmas we encounter with this disease."

These discussions eventually led to the formation of collaborative work groups with the goal of publishing guidelines outlining how pediatric surgeons should approach Hirschsprung disease surgically. These findings were published in the *Journal of Pediatric Surgery* in 2019, with additional findings published in subsequent issues of the journal.[3]

The 2019 guidelines described standardized principles for surgical and pathology reporting to improve outcomes for Hirschsprung disease patients and "facilitate identification of correlations among

The human connection between clinician and patient, according to Dr. Gosain, is a key driver of quality care. *(Credit: Cece Rooney, UVA Health)*

morphology, function, genetics and outcomes, which are required to improve the overall management of these patients."

In 2024, Dr. Gosain and colleagues published another article in the journal outlining recommendations for managing children with total colonic Hirschsprung disease before and after reconstruction, including "diagnostic criteria, surgical approaches, bowel management, diet, antibiotic prophylaxis, colonic irrigations, and post-surgical considerations."[4]

Navigating Dual Career of Surgeon-Scientist

Integrating clinical practice and training with dedicated time for research can be a daunting task for surgeon-scientists, particularly for younger investigators.

In the 2019 article "A Roadmap for Aspiring Surgeon-Scientists in Today's Healthcare Environment," cowritten by Dr. Gosain and published in the *Annals of Surgery*, the authors provided a suggested timeline for the next generation of surgeon-scientists to establish a career and identify mentors.[5] For example, years 2 to 3 are opportune times to begin writing grants and pursuing extramural research funding, as the first year is typically devoted to obtaining a faculty position and determining an area of preferred research focus.

Selecting an institution where the surgeon–scientist is a strategic priority, supported by mentors with a demonstrated history of delivering results also is essential.

"There is a roadmap to follow. You can look at people who are 5 to 10 years down the road from where you are currently and see that the path they followed has been successful for them," said Dr. Gosain. "All of this assumes that you are genuinely passionate about the science itself, that you want to make a contribution, and that it's the thing that gets you out of bed every single day. You need that mindset."

Selecting an institution where the surgeon–scientist is a strategic priority, supported by mentors with a demonstrated history of delivering results also is essential.

"I think that surgeon-scientists live in this strange world where faculty who are 100% research focused don't understand what we do when we're not in the lab. And faculty who are 100% clinical don't understand what we do when we're not in clinic or in the OR," Dr. Gosain said. "As surgeon-scientists, it's our job to link these two worlds and make sure each understands the importance of the other, as we help translate the work back and forth. As surgeons, we have access to patients and tissue and blood samples and stool samples that no other specialty really has. I think being able to capitalize on that access and bring those things into your lab and use them to advance the work is critically important. That is my pitch for being a surgeon-scientist."

To learn about the basic requirements and obligations associated with the Clowes Award, visit *facs.org/clowes*.

For more information about the ACS Foundation, the programs it supports, and how to contribute, check out *facs.org/foundation*.

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Smart Strategies Help Health Systems Navigate Crises, Prevent Surgery Cancelations

Sheila Lai, MA

Days after Hurricane Helene made landfall in northern Florida in September 2024, communities and hospitals impacted by the Category 4 storm faced the daunting task of rebuilding and maintaining patients' access to care.

MORE THAN 200 PEOPLE died across seven states, and widespread flooding, power outages, and road closures impacted the lives of residents for months.[1]

Several hundred miles north of Florida, catastrophic flooding from Helene overwhelmed Baxter International's manufacturing facility in western North Carolina. The facility, which produces roughly 60% of the country's prepackaged IV fluid products essential for surgeries, was severely damaged, triggering a national IV fluid shortage and forcing hospitals nationwide to postpone elective surgeries.[2,3]

While Hurricane Helene exemplifies the large-scale domino effect disasters can have on healthcare systems, more routine challenges also can disrupt healthcare delivery in less catastrophic, though still frequent and significant, ways. These challenges may range from transportation barriers that prevent patients from arriving on time to appointments to operational deficiencies that lead to last-minute surgery cancelations.

No matter the cause of disruptions, experts emphasize that implementing proactive strategies is essential to keeping hospital systems resilient and ensuring continuous access to care.

"There are so many different things that can cause disruptions in healthcare and missed appointments. Roads may not be passable after a significant storm, staff may not be able to reach a facility in emergencies, or a lung cancer patient may not be able to go outside because of wildfire smoke, making it unsafe for them to travel," said Leticia Nogueira, PhD, MPH, scientific director of Health Services Research at the American Cancer Society.

Dr. Nogueira is one of several researchers and clinicians working to understand the causes of healthcare disruptions, determine when and how they may occur, and how to help healthcare systems best prepare for them.

Solutions to disruptions and missed appointments depend greatly on context and identifying the root cause. Three ongoing projects highlight the distinct ways healthcare can be disrupted at the system, patient, and operational levels—and the individualized solutions to each.

Preparing for the Unexpected

At the broadest level, large-scale crises reveal critical weaknesses and opportunities to strengthen hospital workflows and emergency responses. A 2021 analysis published in the *Annals of Surgery* found that hospitals lost more than $20 billion in revenue nationally from elective surgeries canceled between March and May 2020, which triggered a backlog of delayed procedures. Elective surgeries also can include time-sensitive procedures, such as biopsies, hernia repairs, or valve replacements, according to the study, noting that delays in these appointments, though categorized as elective, can worsen patient outcomes.[4]

While the COVID-19 pandemic was unprecedented in scope and scale, it mirrored what often happens during any large-scale emergency: patients are left without access to critical services, and hospital revenue is strained.

A collaboration between the ACS and the American Cancer Society aims to develop strategies to better prepare cancer centers for events that can trigger large-scale disruptions, including climate-related disasters and health emergencies such as the COVID-19 pandemic.[5]

"We're trying to make sure hospitals don't have to reinvent the wheel every time a disaster or disruption happens, and that as a community, we're better prepared to handle these disruptions," said Dr. Nogueira, one of the key leaders of the collaborative.

The initiative recently launched a baseline survey to identify current barriers that centers face, including the impact of recent disasters

The root causes of these disruptions often vary widely based on personal factors and access to care.

and centers' preparedness to manage challenges, to inform the development of targeted support tools (e.g., facility-wide educational materials, automated messages, information on health risks of different hazards). The survey is available at *https://redcap.facs.org/surveys/?s=H44W8EDP39EFRAFL*.

Also important is gaining firsthand knowledge from healthcare systems affected by prior disasters to foster greater collaboration.

"Many times, the most relevant expertise comes from people with lived experience. Healthcare providers in places like Puerto Rico and the Virgin Islands, where resources may be limited, often develop the most innovative solutions," Dr. Nogueira said.

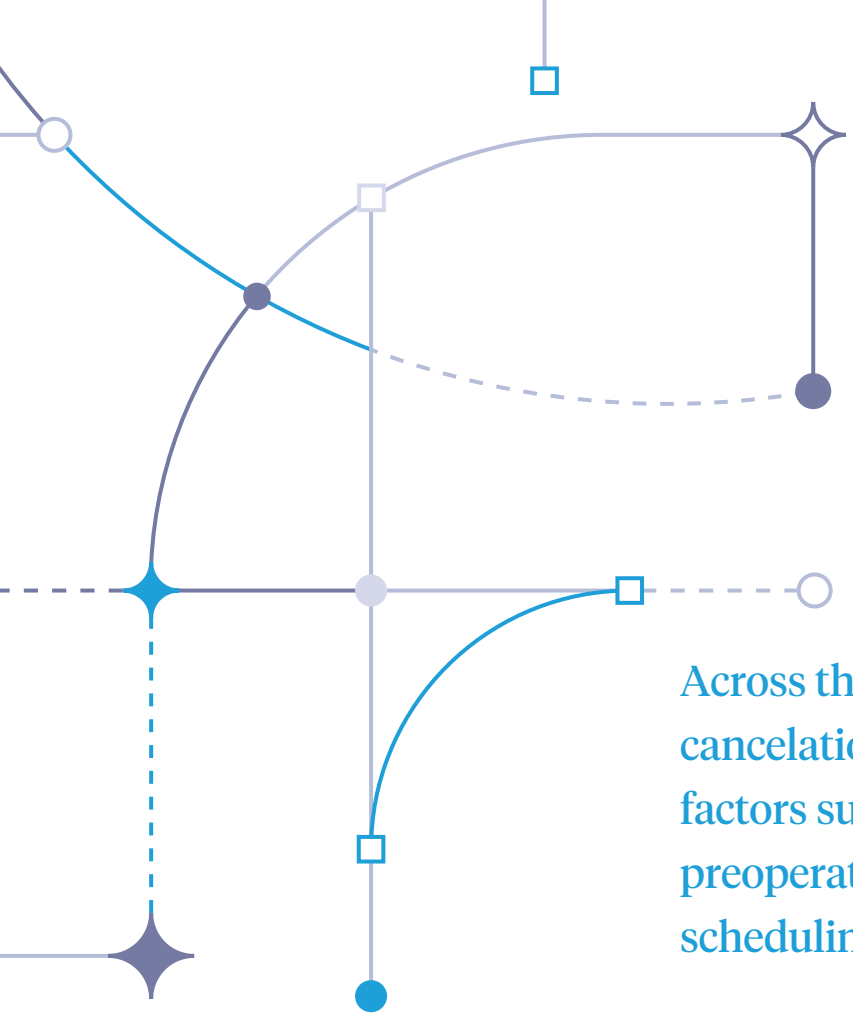
Patient Factors Contributing to Missed Appointments

Even without major disruptions, many patients encounter personal challenges in their daily lives that can lead to missed appointments and canceled surgeries.

The root causes of these disruptions often vary widely based on personal factors and access to care. Transportation is one major source of disruption for patients and healthcare systems, contributing to missed appointments, including surgeries, and reduced outcomes. Researchers estimate that between three and six million people annually delay healthcare due to a lack of transportation, and a disproportionate number live below poverty levels and have chronic health conditions.[6] Other patient-specific factors—such as financial concerns and insurance barriers—also can contribute to delayed care.[7] For oncologic patients in particular, missed or delayed appointments can be especially detrimental to health, increasing rates of morbidity and mortality.[8]

Breaking Barriers, a national quality improvement project launched by the ACS, identified the main barriers cancer patients face during time-sensitive radiation treatment. The topic of missed radiation appointments was selected after surveying cancer centers about a common source of disruption that affects patients and their health systems. Barriers were wide-ranging, with transportation (62%) and illness unrelated to cancer treatment (37%) most often causing patients to miss three or more radiation appointments.[9]

Importantly, barriers were not uniform across patients seeking cancer treatment, even if they fell within the same category. Illness, for example, was not always due to a virus or other physical condition and was often related to untreated depression or anxiety that caused significant symptoms. Access to transportation also was highly dependent on the region. In an urban setting, not being able to afford a bus pass may be a more significant obstacle than distance, whereas in more rural areas, distance and the inability to secure a ride may prevent patients from completing treatment.



Across the US, rates of day-of-surgery cancelations vary widely, driven by factors such as patient no-shows, preoperative noncompliance, and scheduling challenges.

Even outside of cancer care, travel time can significantly impact surgical outcomes across other specialties. Research shows that patients with emergency general surgery conditions who have a travel time of 60 minutes or longer are more likely to require operative interventions and have extended inpatient hospital stays.[10]

Due to the wide variety of barriers, solutions must be tailored to the specific population. For the Breaking Barriers project, the most successful strategies involved technology-based solutions (automated patient reminders), designating patient navigators to provide additional support to vulnerable patients, and improving scheduling and follow-up workflows. Project leaders noted that assigning a designated staff member to follow up with patients may help prevent future missed appointments, and using fractionated radiation treatment schedules to reduce the number of visits required may be appropriate for some patients, especially those at risk of disruptions.[11] Thanks to these Breaking Barriers strategies and a universal toolkit that guided centers in effective solutions, participating centers reduced missed radiation appointments by 40%.

"Centers found that asking patients about the reasons behind missed appointments or screening them beforehand for potential barriers could make a meaningful difference in helping them adhere to their treatment schedule and allow hospitals to develop system-wide solutions," said Laurie J. Kirstein, MD, FACS, Chair of the ACS Commission on Cancer and a breast surgical oncologist at Memorial Sloan Kettering Cancer Center in New York, who led the Breaking Barriers project. "Participating centers also reported significant benefits from collaborative sessions, where they learned from one another about solutions."

Preventing Day-of-Surgery Cancelations at the Hospital Level

In the absence of major crises or transportation barriers, gaps in communication or workflow processes can still disrupt healthcare, even for scheduled surgeries.

Across the US, rates of day-of-surgery cancelations vary widely, driven by factors such as patient no-shows, preoperative noncompliance, and scheduling challenges.[12] Research on the causes of surgery cancelations

is limited predominantly to hospital-level case studies.

A 2012 retrospective review of canceled outpatient pediatric urology procedures at Children's Hospital Colorado in Aurora found that while cancelations from illness and other factors are not always preventable, up to a quarter of cancelations were due to insurance-financial issues, preoperative fasting violations, or other issues the authors noted could potentially be prevented. They also observed that improved hospital interventions, such as enhanced processes for evaluating insurance status and ensuring effective preoperative parental education, could reduce cancelations.[13]

Another review of canceled elective outpatient surgeries at Tulane University Medical Center in New Orleans, Louisiana, found that institutional issues—such as a lack of available beds or equipment—contributed to nearly one-third of cancelations.[14] Patient inability to comply with preoperative instructions or delays in arrival, caused by transportation problems, confusion about the date of surgery, or other reasons, also were notable causes of surgical cancelations across the hospital system.[15] The study authors estimated that average revenue lost ranged from $1,325 to $5,962 per cancelation.

For healthcare systems, delving into the specifics of their patient populations can yield solutions. For instance, the Tulane study found that patients who completed a preoperative visit with an anesthesiologist were far less likely to have their surgery canceled compared with those who did not (4% vs. 11%).

More recently, a multidisciplinary team at Cincinnati Children's Hospital Medical Center in Ohio led a quality project to address preventable day-of-surgery cancelations, which averaged about 15 per week across all locations and predominantly affected patients with government insurance.

While the financial impact of canceled surgeries was initially the primary concern, analyzing the reasons for missed appointments revealed opportunities to improve patient access to care, noted Norm Honecker, MBA, RN, vice president of perioperative services administration at Cincinnati Children's Hospital Medical Center.

Honecker presented at the 2025 ACS Quality and Safety Conference, highlighting a

Roadmap for Preventing Canceled Surgeries and Missed Appointments

Some of the most successful interventions focused on increasing support and enhancing communication processes for patients at risk of cancelations.

hospital-wide effort to identify the causes of day-of-surgery cancelations among pediatric patients and develop solutions to prevent them.

Through an analysis, Honecker and his team found that language barriers, inconsistent reminders, and poorly communicated surgery preparation instructions frequently led to preventable cancelations on the day of surgery.

"Communication was probably the number one factor," Honecker said. "Oftentimes, before surgery, we handed families a large folder—more than they ever would need—and didn't have consistent methods to make sure we were communicating with them effectively."

Honecker and a team developed a revised preop schedule and implemented other solutions to reduce missed appointments.[16] Some of the most successful interventions focused on increasing support and enhancing communication processes for patients at risk of cancelations:

- **Early verification of contact information:** Before surgery, a team screens parents or caregivers for the best contact phone numbers, as well as alternative numbers the care team can use.
- **Proactive reminders 72 hours before surgery:** The revised system includes structured ways to follow up with families who cannot be reached by phone, including assigning a call lead who can employ different methods of contact if needed (e.g., MyChart, seeking alternative phone numbers).
- **Automated reminders translated into a patient's native language:** Through an analysis, the team identified language needs for patients who spoke Spanish and Arabic. Reminders are now translated for these patients.
- **Patient navigators:** Patient navigators are assigned to patients who need additional assistance—whether related to transportation issues or understanding preoperative instructions.

The project resulted in a decrease in day-of-surgery cancelations from 15 per week to about eight, according to Honecker, and provided the care team with actionable plans to address the barriers many patients face in obtaining necessary medical care. However, identifying the root causes of cancelations and maintaining lower cancelation rates will be an ongoing process.

"A lot of projects get started, make a dent, and then are pushed aside," he said. "We're trying to make sure this one is sustainable." B

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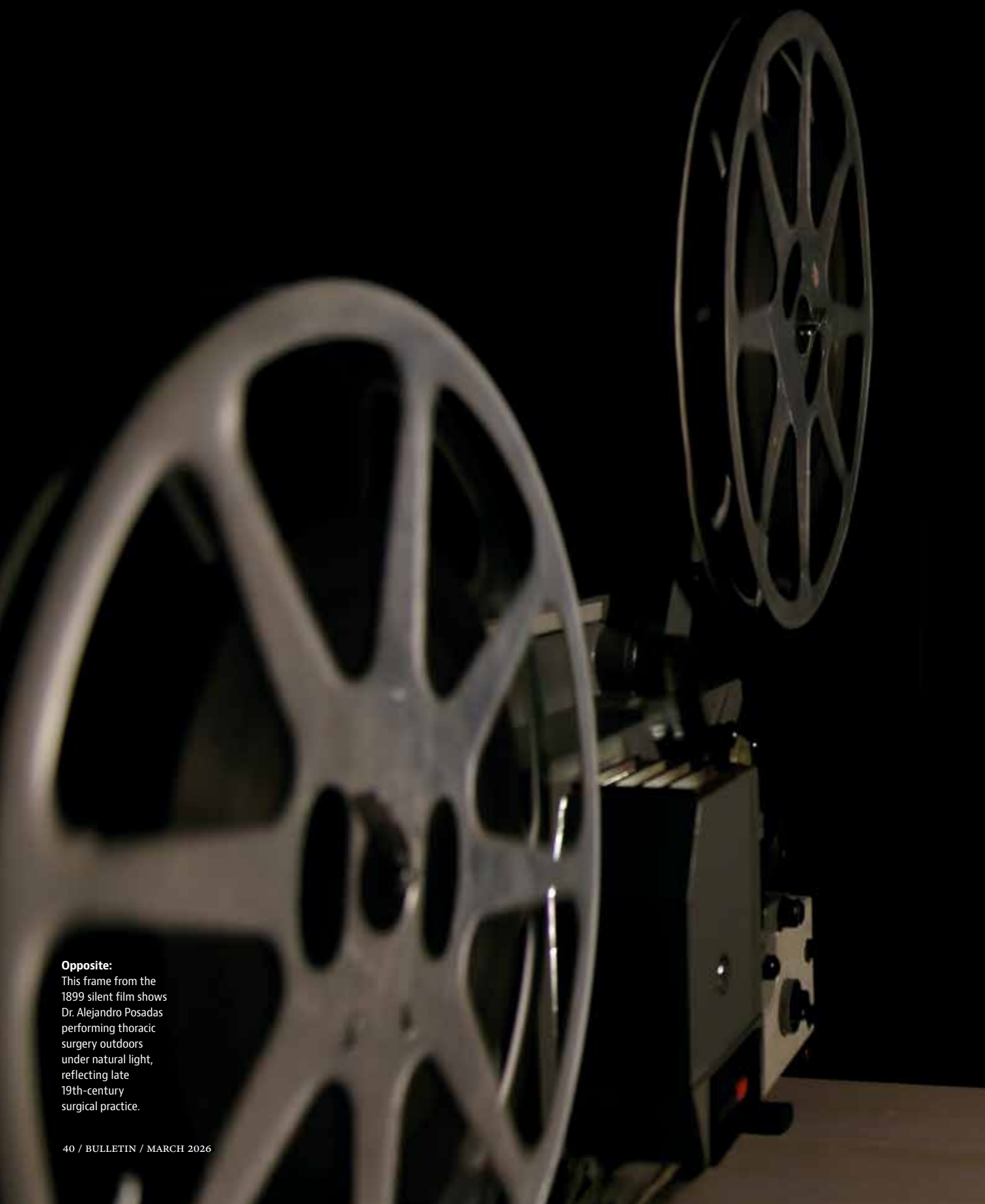


Opposite:
This frame from the 1899 silent film shows Dr. Alejandro Posadas performing thoracic surgery outdoors under natural light, reflecting late 19th-century surgical practice.

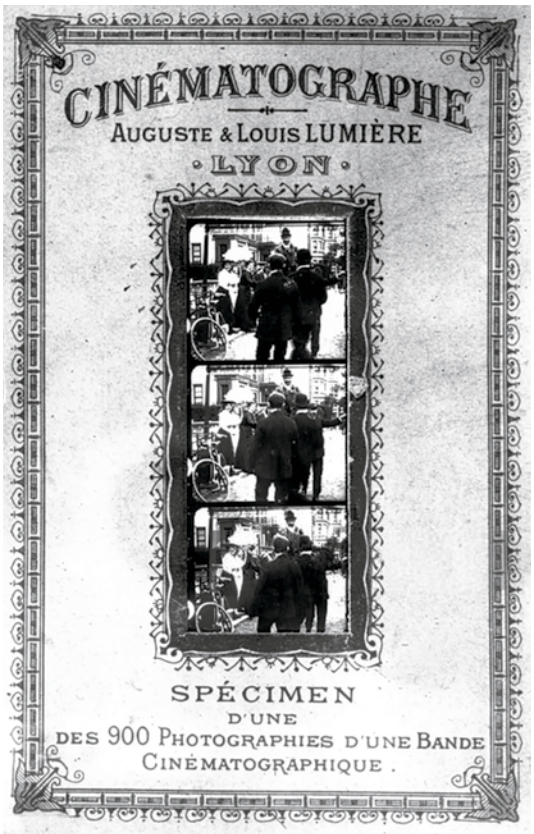
First Filmed Surgery Sparks New Era of Medical Cinema

Tamara N. Almada, MD, MAAC, FACS

The 19th century was a period of technological innovation and profound transformation in science.

as medical knowledge expanded, significant advances were made in medical procedures, equipment, and the understanding of human physiology.[1] At the same time, a new technology—"moving images"—emerged and began to transform the way the world perceived reality.

In 1895, the Lumière brothers (Auguste and Louis) introduced the cinematograph in Paris, marking the birth of cinema. What they likely never imagined was that within just 4 years, their revolutionary invention would be adopted for an unforeseen purpose—medical education and scientific documentation—which, today is a fundamental component of modern surgical practice.



The first public screening of a Lumière Brothers film took place at the Grand Cafe on the Boulevard des Capucines in Paris on December 28, 1895.

In 1899, at the original Hospital de Clínicas in Buenos Aires, Argentina, visionary surgeon Alejandro Posadas, MD, collaborated with French cinematography pioneer Eugenio Py to film a pulmonary operation performed under general anesthesia.

The silent 35-mm film, *Operaciones del Dr. Posadas,* is recognized by the Cinémathèque française and Royal Belgian Film Archive as the earliest-known surviving motion picture of a surgical operation.[2] This film represents the moment when surgery first met the camera, giving birth to medical cinema and forever changing how surgical knowledge could be preserved, shared, and taught.

Medicine at Dawn of Moving Images

By the late 19th century, the practice of surgery was experiencing an era of rapid but uneven transformation. Antiseptic principles were gaining acceptance, sterile gloves were only beginning to be introduced, surgical masks were not yet routine, and general anesthesia was administered with chloroform allowing surgeons to attempt more complex procedures, but with significant risk that demanded technical precision and speed.[1]

Simultaneously, a new visual era was emerging. The Lumière brothers' early films documented factory workers and, urban and everyday life.[3] However, the potential of films as a scientific and educational tool had not yet been realized.

At the time, medical teaching relied primarily on direct observation in crowded operating theaters, hand-drawn illustrations, and large photographic prints. Since the mid-19th century, photographic documentation of the human body had already entered the scientific medical discourse, establishing visual representation as a fundamental component of medical knowledge.[3] It was within this context that Dr. Posadas conceived a revolutionary idea. He envisioned film not as entertainment but as a powerful instrument for education and scientific documentation. His decision to record a surgery on motion picture film, just 4 years after the Lumière brothers' invention, would place Buenos Aires at the center of a global milestone in the history of surgery and medical education.

Visionary Surgeon

Born in Saladillo, a small town in Buenos Aires province, Dr. Posadas entered the Faculty

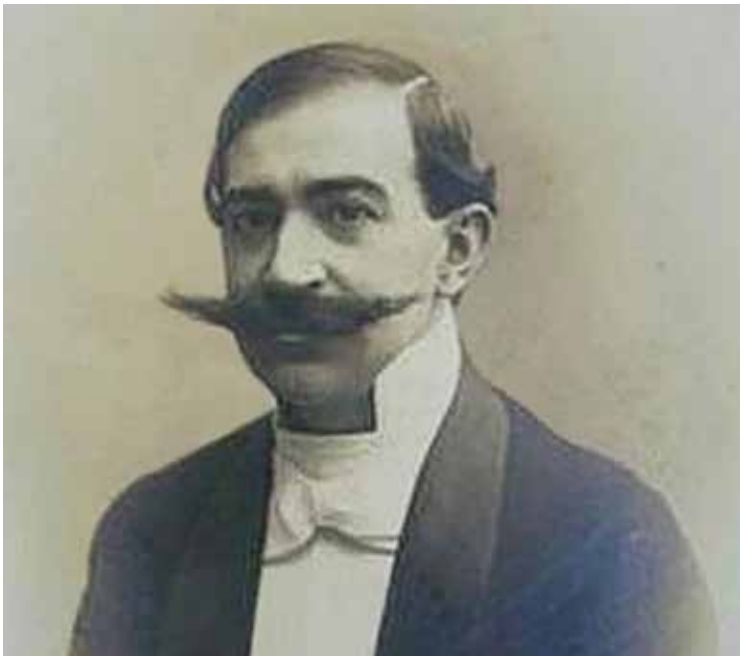
By the late 19th century, the practice of surgery was experiencing an era of rapid but uneven transformation.

of Medicine at the Universidad de Buenos Aires in 1888 and quickly distinguished himself as both a clinician and an investigator.[4]

While still a medical student, he described the world's first case of what would later be recognized as coccidioidomycosis in a patient with recurrent cutaneous lesions. He dedicated his thesis to this research, historically known as Posadas-Wernicke disease. The fungal pathogen was later identified and named Coccidioides posadasii in his honor.[5-7]

Dr. Posadas is considered the father of thoracic surgery in Argentina. He developed pioneering techniques such as the temporary partial thoracoplasty with pulmonary harpooning to the parietal pleura. This method prevented pneumothorax, eliminating the need for postoperative drainage and making thoracic surgery safer at a time when it was considered high risk.[8] He presented his innovative technique at the First Latin American Congress of Surgery in Buenos Aires.[3,9]

Dr. Posadas also was a master educator who improved surgical teaching by systematically adopting visual tools long before they became standard. In addition to his use of detailed hand-drawn anatomical illustrations and large photographic prints, he introduced the use of x-ray imaging in Argentina, integrating radiographic studies into both clinical practice and education.[3,8,9] This dedication to visual pedagogy would lead him to explore a new visual technology: cinematography.



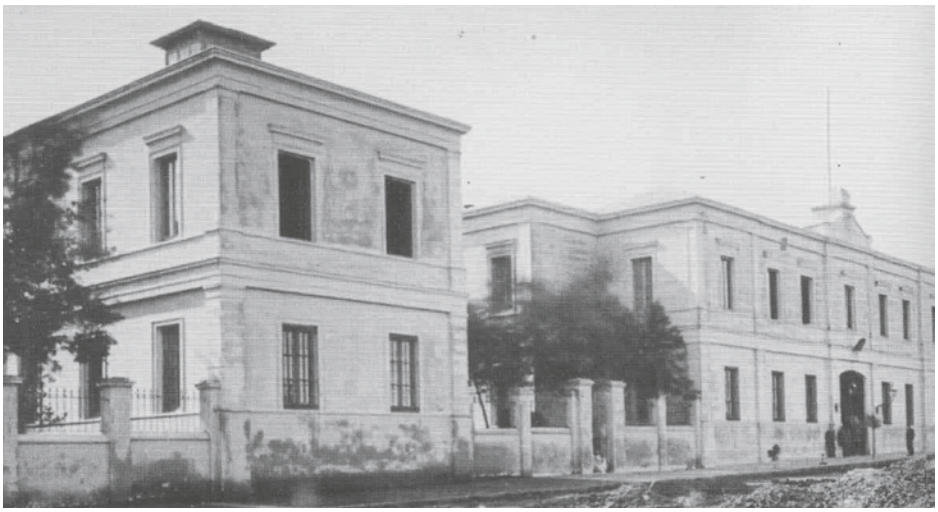
Dr. Alejandro Posadas (1870–1902) was an Argentine surgeon, educator, and pioneer of thoracic surgery.

Unfortunately, Dr. Posadas's career was tragically brief. After developing pulmonary disease, he sought treatment in Europe and the US, but he ultimately succumbed to tuberculosis in Paris in 1902, at just 31 years of age.[9]

Birth of First Medical Film

Due to the technical limitations of early cinematography, the pulmonary operation suggested by Dr. Posadas could not be filmed indoors. Therefore, it was performed and recorded under natural light in the hospital's internal courtyard. The footage provides an authentic visual record of late-19th-century surgical practices, with surgeons wearing long white gowns and rolled-up sleeves, without gloves, masks, or caps, reflecting the standards of asepsis as understood at the time.

The silent film was shot on 35-mm film using a fixed-position French Elgé camera manufactured by French inventor and engineer Léon Gaumont. With a duration of approximately 3 minutes and 46 seconds, *Operaciones del Dr. Posadas* documents Dr. Posadas performing his innovative thoracic surgical technique: a temporary partial



In 1899, the first filmed surgical operation was performed at the original Hospital de Clínicas in Buenos Aires.

thoracoplasty with pulmonary harpooning to the parietal pleura, performed to treat a right pulmonary hydatid cyst.

The footage shows a male patient with an open right hemithorax, exposing the operative field. The operation is carried out with calm precision and notable speed, an essential requirement to minimize the risks associated with long exposure to chloroform anesthesia and the limitations of natural light.

Interestingly, this film also documents the administration of general anesthesia by the Argentine medical trainee Rodolfo S. Roccatagliata using the open-drop technique, applying chloroform with a Schimmelbusch mask. At the time, anesthesia was commonly administered by medical practitioners, nurses, or religious sisters, known as chloroformists, while anesthetized patients were described as "chloroformed." This recording, therefore, represents not only the first filmed surgical operation, but also the first filmed general anesthesia in medical history.[2]

Enduring Legacy

For decades, these original films faded into oblivion after their initial exhibition and limited circulation. Their historical significance remained unrecognized for much of the 20th century. The survival of the world's first film surgical operation was secured thanks to a fortuitous rediscovery.

In the 1970s, during the demolition of the original Hospital de Clínicas, Dr. Florentino Sanguinetti discovered the original 35-mm reel documenting Dr. Posadas's pulmonary surgery while sorting through an abandoned archive.[2,3,9] Had the demolition not been scheduled, the film could have been lost forever and, with it, a fundamental chapter in the history of surgery, anesthesia, and medical education would have disappeared.

A second film, documenting a left inguinal hernia repair, was rediscovered in March 1987, by Dr. Fermín García Marcos, from the Department of History of Medicine at the Faculty of Medicine Sciences of the Universidad de Buenos Aires. Today, both films are currently preserved by the Fundación Cinemateca Argentina.[2,3,9]

In recent years, the historical legacy of these films has gained renewed visibility. Dr. Posadas's filmed surgery is now exhibited at the Museum of the Hospital de Clínicas of Buenos Aires, where it continues to educate and inspire new generations of surgeons.

What began in a sunlit hospital courtyard in Buenos Aires in 1899 stands today as a global milestone in the history of surgery, medical education, and documentation. It marks the genesis of a visual legacy that has become an integral part of modern surgical practice, through operative recording, academic lectures, livestreamed surgeries, and online surgical tutorials.

This historic event, nearly lost to time, represents the moment when the camera first entered the operating room and is remembered not as a curiosity but as a turning point in the art of seeing, knowing, and teaching surgery. B

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EDITOR'S NOTE: *This article is based on the second-place winning entry in the 2025 History of Surgery Poster Competition, which occurred in conjunction with Clinical Congress.*

Operaciones del Dr. Posadas

Production:
Eugenio Py

Camera:
Elgé (Gaumont)

Year:
1899

Duration:
3:46

Location:
Hospital de Clínicas, Buenos Aires

Procedure:
Pulmonary hydatid cyst resection

Patient:
Male

Surgeon:
Dr. Alejandro Posadas

Surgical Assistant:
Practitioner Viale

Anesthetist:
Medical trainee
Rodolfo S. Roccatagliata

Nurse:
Ramón Vázquez

Access *Operaciones del Dr. Posadas* via Videoteca de Cine Argentino:

www.cinemargentino.com/films/914988656-operaciones-del-dr-posadas

Cinematography pioneer Eugenio Py used his fixed-position 35 mm camera to record *Operaciones del Dr. Posadas*.

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Dr. Charles Mabry

Get Credit for Unlisted CPT Codes: Compliant Approaches to wRVU Valuation

Charles D. Mabry, MD, FACS
Christopher P. Childers, MD, PHD
Don Selzer, MD, FACS
Chris Senkowski, MD, FACS

Most surgeons today work in employment arrangements where compensation is tied to production, often measured in work relative value units (wRVUs).

EACH CURRENT PROCEDURAL TERMINOLOGY (CPT®)* code is assigned wRVUs by the US Centers for Medicare & Medicaid Services (CMS), based on recommendations from the American Medical Association/Specialty Society Relative Value Scale Update Committee (AMA RUC).[1-3] While the dollar value of each wRVU varies across payers and contracts, the wRVUs provide a relatively stable benchmark for measuring and rewarding surgeon productivity.

However, not all procedures correspond neatly to a CPT code descriptor. When this happens, coders will often rely upon "unlisted" codes to document the work performed. Because unlisted codes are a catchall for these orphan procedures, they are not assigned a value and reward exactly zero wRVUs. As a result, surgeons may not receive proper credit for their efforts. This article presents two methods to create fair wRVU values for unlisted codes, in an effort to assist both surgeons and institutions in recognizing the true value of the work performed.

Understanding Unlisted Codes: Institutional Perspective

Coders are required by corporate compliance and federal law to select the CPT code that most accurately describes the service provided.[2] When no code is appropriate, they are instructed to use an unlisted CPT code from the appropriate anatomic section (codes typically end in "99"). For unlisted codes, institutions also must submit:

- Key details regarding how the procedure was performed, anatomic area involved, and clinical indications
- Supplemental report describing the nature and extent of disease, indications, time and effort, and any special equipment used[3]

The payer then assigns both the payment and global period based on this documentation. A key insight that surgeons should be aware of is that it is possible to enhance reimbursement by including detailed explanatory text in the operative notes, which makes it easier for institutions to forward documentation to payers.

Claiming Your Value: Surgeon Perspective

The following provides two broad methods for assigning wRVUs to unlisted codes. The first, and simpler approach, uses a single crosswalk linking a known CPT code to the unlisted code. The second, slightly more labor-intensive process, assigns values using average wRVUs from a family of similar codes.

Both approaches are transparent, easy to understand, and comply with the Ethics in Patient Referrals Act (also known as Stark Laws I, II, and III),[4] as they rely on predetermined methodology tied to established wRVUs, instead of service volume. Both of these methods are currently in use in US institutions where practices are receiving payment and the surgeons are receiving wRVU credit.

*All specific references to CPT codes and descriptions are

Method 1: Single-code crosswalk

Select a CPT code that best approximates the work involved with the unlisted procedure—this is identified as the "crosswalk" code. Next, assign the wRVU from the crosswalk code to the unlisted code.

Example 1: Minimally invasive oversewing of perforated ulcer

Crosswalk to: CPT 43840 (*Open version of the same procedure*)
This crosswalk method works well when there are one-to-one matches between an open and minimally invasive surgery. Other examples might include distal pancreatectomy or laparoscopic hepatectomy.

HCPCS	Description	Status Code	Work RVU	Global Days
43840	Gastrorrhaphy, suture of perforated duodenal or gastric ulcer, wound or injury	A	22.83	090

HCPCS = Healthcare Common Procedure Coding System

Example 2: Laparoscopic/robotic gastric/small bowel lesions or GIST removal

Crosswalk to wRVUs (see below): CPT 43610 (*Excision of stomach lesion* [if benign]) and CPT 43611 (*Excision of stomach lesion* [if malignant]) and CPT 44110 (*Excise intestine lesion[s]*) for all small bowel lesions.

HCPCS	Description	Status Code	Work RVU	Global Days
43610	Excision of stomach lesion	A	16.34	090
43611	Excision of stomach lesion	A	20.38	090
44110	Excise intestine lesion(s)	A	14.04	090

Example 3: Multiple crosswalks

For procedures with several discrete steps:

1. Identify all applicable CPT codes.
2. Select codes that approximate the individual components of the operation.
3. Include 100% of highest wRVU value and 50% of remainder. This mirrors CMS's multiple-procedure payment rule, ensuring that secondary components are appropriately discounted without undervaluing the overall operation.

The following depicts what this approach would look like for a complex breast operation with oncoplastic reconstruction.

Yellow highlights identify the unlisted CPT code and resultant calculated wRVU value.

HCPCS	Description	Status Code	Work RVU	Global Days
14301	Tis trnfr any 30.1-60 sq cm	A	12.65	090
19301	Partial mastectomy	A	10.13	090
19316	Mastopexy	A	11.09	090
19499	Hypothetical procedure breast	C	0	YYY
Calculation	**=12.65+0.5*(10.13+11.09)**		**23.26**	

Method 2: Average of a Family

This approach calculates an average wRVU across a group ("family") of related CPT codes, then applies that value to the unlisted procedure. The method allows institutions to pre-assign wRVUs for unlisted codes prospectively, rather than determining values on a case-by-case basis:

1. Download the CMS Excel file that contains CPT codes and their wRVUs. https://www.cms.gov/medicare/payment/fee-schedules/physician/pfs-relative-value-files.
2. Sort the Excel file to exclude non-used HCPCS codes and other CPT codes.
3. Arrange the Excel file in CPT numerical order.
4. Construct "families" of similar organs and work-valued CPT codes.
5. Exclude dissimilar codes from each family (low value or ZZZ codes).
6. Calculate average value for each family and apply that value to the unlisted CPT code.

Example 4: Unlisted laparoscopic/robotic procedures on the esophagus

For examples 4, 5, and 6: Green highlights identify CPT codes used as a "family;" tan identifies codes excluded from the "family;" yellow identifies the unlisted CPT code and the resultant calculated wRVU value.

HCPCS	Description	Status Code	Work RVU	Global Days	
43340	Fuse esophagus & intestine	A	22.99	090	
43341	Fuse esophagus & intestine	A	24.23	090	
43351	Surgical opening esophagus	A	22.05	090	**Average wRVU**
43352	Surgical opening esophagus	A	17.81	090	**27.19**
43360	Gastrointestinal repair	A	40.11	090	
43361	Gastrointestinal repair	A	45.68	090	
43400	Ligate esophagus veins	A	25.60	090	
43405	Ligate/staple esophagus	A	24.73	090	
43410	Repair esophagus wound	A	16.41	090	
43415	Repair esophagus wound	A	44.88	090	
43420	Repair esophagus opening	A	16.78	090	
43425	Repair esophagus opening	A	25.04	090	
43450	Dilate esophagus 1/mult pass	A	1.28	000	**Exclude**
43453	Dilate esophagus	A	1.41	000	**Exclude**
43460	Pressure treatment esophagus	A	3.79	000	**Exclude**
43496	Free jejunum flap microvasc	C	0.00	090	**Ignore**
43497	Transorl lwr esophgl myotomy	A	13.29	090	**Assigned wRVU**
43499	Unlisted procedure esophagus	C	0.00	YYY	**27.19**

Example 5: Unlisted laparoscopic/robotic procedure on the stomach

HCPCS	Description	Status Code	Work RVU	Global Days	
43800	Pyloroplasty	A	15.43	090	
43810	Gastroduodenostomy	A	16.88	090	
43820	Gastrojejunostomy wo vagotmy	A	22.53	090	
43825	Gastrojejunostomy w/vagotomy	A	21.76	090	
43830	Gstrst open wo constj tube	A	10.85	090	**Exclude**
43831	Gastrostomy open neonatal	A	8.49	090	**Exclude**
43832	Gstrst open w/constj tube	A	17.34	090	
43840	Repair of stomach lesion	A	22.83	090	
43843	Gastroplasty w/o v-band	A	21.21	090	**Average wRVU**
43845	Gastroplasty duodenal switch	A	33.30	090	**23.82**
43846	Gastric bypass for obesity	A	27.41	090	
43847	Gastric bypass incl small i	A	30.28	090	
43848	Revision gastroplasty	A	32.75	090	
43860	Revise stomach-bowel fusion	A	27.89	090	
43865	Revise stomach-bowel fusion	A	29.05	090	
43870	Repair stomach opening	A	11.44	090	
43880	Repair stomach-bowel fistula	A	27.18	090	
43881	Impl/redo electrd antrum	C	0.00	YYY	**Ignore**
43882	Revise/remove electrd antrum	C	0.00	YYY	**Ignore**
43886	Revise gastric port open	A	4.64	090	**Exclude**
43887	Remove gastric port open	A	4.32	090	**Exclude**
43888	Change gastric port open	A	6.44	090	**Exclude**
43999	**Unlisted procedure stomach**	C	0.00	YYY	**Assigned wRVU**
44005	Freeing of bowel adhesion	A	18.46	090	**23.82**

This article provides two methods for assigning wRVU valuations to unlisted codes: single-code crosswalks and the average of the family. While there are other ways to assign these values, the methods presented are easy to understand and align with all the other requirements for physician compensation. These approaches currently are being used in institutions and surgeon practices for reimbursement and satisfy requirements for valuation. Ultimately, transparent and consistent assignment of wRVUs benefits both surgeons and institutions as it ensures fair compensation, accurate benchmarking, and recognition of the true value of surgical innovation.

Example 6: Unlisted laparoscopic/robotic procedures on the small bowel

HCPCS	Description	Status Code	Work RVU	Global Days	
44180	Lap enterolysis	A	15.27	090	
44186	Lap jejunostomy	A	10.38	090	
44187	Lap ileo/jejuno-stomy	A	17.40	090	
44188	Lap colostomy	A	19.35	090	
44202	Lap enterectomy	A	23.39	090	
44203	Lap resect s/intestine addl	A	4.44	ZZZ	**Exclude**
44204	Laparo partial colectomy	A	26.42	090	
44205	Lap colectomy part w/ileum	A	22.95	090	**Average wRVU**
44206	Lap part colectomy w/stoma	A	29.79	090	**25.80**
44207	L colectomy/coloproctostomy	A	31.92	090	
44208	L colectomy/coloproctostomy	A	33.99	090	
44210	Laparo total proctocolectomy	A	30.09	090	
44211	Lap colectomy w/proctectomy	A	37.08	090	
44212	Laparo total proctocolectomy	A	34.58	090	
44213	Lap mobil splenic fl add-on	A	3.50	ZZZ	**Exclude**
44227	Lap close enterostomy	A	28.62	090	
44238	**Unlisted laps px intestine**	C	0.00	YYY	**Assigned wRVU**
44300	Open bowel to skin	A	13.75	090	**25.80**

Disclaimer
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Dr. Alexandra Helbing

Surgeons Confront Misaligned Radioactive Iodine Use in Follicular Thyroid Carcinoma

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Follicular thyroid carcinoma (FTC) represents a smaller but clinically distinct subset of differentiated thyroid cancers.

WHILE MANY PATIENTS experience excellent outcomes following surgical management, FTC exhibits a wider range of biologic behavior than papillary thyroid cancer, with a greater propensity for vascular invasion and distant metastasis that directly influence postoperative management decisions. For decades, radioactive iodine (RAI) has played a central role in postoperative management, particularly for patients with high-risk disease.[1-3]

Current National Comprehensive Cancer Network (NCCN) guidelines advocate for a selective, risk-adapted approach to RAI use.[2] High-risk FTC patients are generally recommended to receive adjuvant RAI due to demonstrated survival benefit, while routine use in low-risk patients is discouraged. Despite these guidelines, national practice patterns continue to diverge from guideline treatment recommendations in clinically meaningful ways.

Across large datasets, a consistent pattern emerges. A substantial proportion of high-risk patients do not receive RAI despite evidence of benefit, while many low-risk patients receive RAI without measurable improvement in survival. These deviations raise important questions for surgeons, who often determine the trajectory of postoperative decision-making, multidisciplinary coordination, and referral pathways.

This article examines national cancer database trends in RAI use for FTC and reframes them through a surgeon-facing lens. The goal is to highlight persistent misalignment between risk stratification and adjuvant therapy, explore its implications for patient outcomes and healthcare equity, and outline actionable considerations for surgeons seeking to deliver guideline-concordant, high-value care.

Why Risk-Aligned RAI Use Matters in FTC

Risk stratification is foundational to contemporary thyroid cancer management and central to postoperative planning. In FTC, features such as extrathyroidal extension, vascular invasion, nodal burden, distant metastases, and poor differentiation meaningfully influence recurrence risk and survival. NCCN guidelines incorporate these factors to guide postoperative treatment decisions, including the use of RAI.[2]

In high-risk FTC, adjuvant RAI has been associated with improved survival, particularly among patients with advanced local disease or metastatic involvement. Conversely, in low-risk FTC, randomized trials and long-term follow-up studies demonstrate that omission of RAI does not compromise oncologic outcomes.[4-7]

Risk-aligned care matters for several reasons. For high-risk patients, failure to deliver indicated adjuvant therapy represents missed opportunity for survival benefit. For low-risk patients, unnecessary RAI exposes individuals to avoidable risks, including salivary gland dysfunction, secondary malignancy, and financial toxicity, while consuming healthcare resources without clear benefit.

For surgeons, risk alignment is an operational principle rather than an abstract guideline concept. It directly influences postoperative counseling, referral timing, and multidisciplinary planning. Surgical decisions often set the trajectory for downstream care.

For surgeons, these findings highlight that operative excellence alone does not ensure optimal oncologic care.

National Patterns Reveal Persistent Misalignment

National cancer registry analyses spanning nearly 2 decades reveal a consistent and concerning pattern. Among patients meeting NCCN criteria for high-risk FTC, approximately one-third do not receive adjuvant RAI. At the same time, more than one-third of patients classified as low risk undergo RAI despite lack of demonstrated survival benefit.

These trends persist even after accounting for tumor stage, margin status, and extent of surgery, suggesting that disease severity alone does not explain observed variation. In other words, deviations from guideline-based care cannot be explained solely by disease severity or operative factors.

Several practical and system-level drivers likely contribute to these deviations:

- **Therapeutic inertia** rooted in historical practice patterns when RAI was more routinely administered
- **Overreliance on surgical extent,** where total thyroidectomy prompts reflexive RAI use regardless of risk profile
- **Uncertainty regarding FTC biology,** particularly in cases with borderline or incompletely characterized features
- **Fragmentation of postoperative care,** with delayed or inconsistent endocrine oncology follow-up

For surgeons, these findings highlight that operative excellence alone does not ensure optimal oncologic care. Alignment with postoperative management pathways is equally critical as misalignment often arises despite appropriate surgical intent. Surgeons may correctly identify risk features at the time of operation, yet downstream care diverges as patients transition between services, institutions, or providers. Without clear ownership of postoperative planning, evidence-based intent can erode across handoffs, leading to both undertreatment and overtreatment.

Where Misalignment Occurs Along the Care Pathway

Misalignment between risk stratification and RAI use emerges cumulatively across the care continuum. Understanding where these inflection points occur allows surgeons to intervene more effectively. Preoperative evaluation represents the first opportunity for alignment. In some cases, incomplete preoperative characterization of FTC risk factors, such as vascular invasion or extent of capsular involvement, limits early anticipation of adjuvant needs. While definitive risk stratification depends on final pathology, early recognition of potential high-risk features can prompt timely planning and referral.

Operative decision-making also plays a role. The extent of surgery may unintentionally signal downstream expectations regarding adjuvant therapy. Total thyroidectomy, while appropriate in many FTC cases, can create an implicit assumption that RAI will follow, even when final pathology demonstrates low-risk disease.

Conversely, conservative surgical approaches in high-risk patients may delay referral for adjuvant evaluation. Pathology reporting represents another critical juncture. Ambiguity in reporting vascular invasion, margin status, or degree of differentiation can complicate risk stratification and lead to inconsistent recommendations. Clear, standardized pathology communication supports appropriate postoperative decisions.

Finally, postoperative referral and follow-up often determine whether guideline-aligned

therapy is ultimately delivered. Delays in endocrine oncology consultation, geographic barriers, or fragmented care transitions disproportionately affect high-risk patients and contribute to observed underuse of RAI. Surgeons remain uniquely positioned to coordinate these transitions.

Survival Implications Are Risk-Dependent

The survival associated with RAI in FTC is not uniform. In high-risk patients, receipt of RAI is associated with a meaningful reduction in mortality, reinforcing guideline recommendations. In contrast, no survival benefit is observed among low-risk patients receiving RAI.[8-10]

This distinction underscores the importance of precision in adjuvant decision-making. When RAI is delivered to patients unlikely to benefit, it dilutes its value while obscuring gaps in care for those who stand to gain the most.

From a surgical perspective, these findings reinforce the need for explicit risk-based conversations during operative planning and early postoperative follow-up. Clear documentation of risk features, margin status, and nodal burden facilitates appropriate downstream decisions.

Practical Considerations for Surgical Practice

Explicit Risk Documentation

Operative reports and pathology discussions should clearly articulate high-risk features, including margin status, vascular invasion, and nodal burden. Ambiguity in documentation can lead to inappropriate downstream decisions.

Early Multidisciplinary Engagement

Prompt referral to endocrinology or tumor board review facilitates timely, risk-appropriate adjuvant planning. Delays disproportionately affect patients with limited access to specialty care.

Avoid Reflexive RAI Pathways Based on Surgical Extent Alone

Total thyroidectomy alone should not trigger automatic RAI referral. Surgeons should resist legacy practice patterns that equate extent of surgery with indication for adjuvant therapy.

Advocate for Equitable Access

Awareness of disparities allows surgeons to proactively support navigation services, telemedicine follow-up, or referral to higher-volume centers when appropriate.

Participate in Quality Improvement Efforts

Institutional order sets, decision-support tools, and postoperative pathways can reinforce guideline-concordant care and reduce variation.

Disparities in RAI Use Reflect Broader System Gaps

Beyond overall misalignment, national data reveal troubling disparities in RAI delivery among high-risk patients. Hispanic, Asian, Black, and other non-White patients are significantly less likely to receive RAI compared to White patients, even after adjusting for tumor characteristics and treatment factors.

Insurance type alone does not fully explain these differences. While Medicaid coverage is associated with worse survival outcomes, reduced RAI use among non-White patients persists independent of insurance status.

These disparities likely reflect systemic and structural barriers rather than isolated individual clinical decisions. Contributing factors may include:

- Limited access to high-volume endocrine or nuclear medicine centers
- Delays in referral for postoperative evaluation
- Geographic and transportation constraints
- Fragmented communication between surgeons, endocrinologists, and nuclear medicine specialists

Surgeons often serve as the primary point of continuity in thyroid cancer care, particularly during the transition from diagnosis to adjuvant planning. Awareness of these disparities is essential, as early referral patterns and care coordination can either mitigate or exacerbate downstream inequities. Addressing disparities therefore requires intentional attention to referral equity. High-risk patients who face barriers to specialty access may benefit from proactive navigation support, early telemedicine consultation, or referral to higher-volume centers. Surgeon awareness and advocacy can meaningfully alter these trajectories.

Resource Stewardship and Value-Based Care

RAI use has implications beyond individual patients. From a health system perspective, overuse in low-risk disease represents low-value care that increases costs without improving outcomes. At the same time, underuse in high-risk patients undermines value by withholding effective therapy.

As healthcare increasingly emphasizes value-based frameworks, surgeons are well positioned to influence appropriate resource utilization. Risk-aligned RAI use aligns clinical outcomes with stewardship principles. Importantly, value-based care emphasizes aligning treatment intensity with patient risk, guided by evidence and established guidelines.

Practical Considerations for Surgical Practice

While systemic change requires multidisciplinary effort, surgeons can take specific steps to improve alignment between risk stratification and adjuvant therapy (see sidebar on previous page).

Implications for Surgical Training and Education

Incorporating risk-based adjuvant decision-making into surgical education can help align operative excellence with longitudinal oncologic care. Training programs should emphasize interpretation of pathology, communication of risk, and coordination with multidisciplinary teams as core competencies.

For trainees, understanding when RAI adds value is as important as understanding how to perform the operation. Embedding guideline-based postoperative planning into surgical education may yield durable improvements in care alignment.

As healthcare increasingly emphasizes value-based frameworks, surgeons are well positioned to influence appropriate resource utilization.

Policy and Educational Implications

At a broader level, these findings support ongoing efforts to standardize thyroid cancer care across institutions. Educational initiatives targeting surgeons, endocrinologists, and trainees should emphasize risk-adapted therapy rather than historical norms.

Policy initiatives that improve access to multidisciplinary care, support care navigation, and reduce geographic barriers may help close observed gaps. Surgeons, as leaders within cancer care teams, are essential voices in shaping these efforts.

National patterns of RAI use in follicular thyroid carcinoma reveal a persistent misalignment between guideline-based risk stratification and real-world practice. High-risk patients are frequently undertreated despite demonstrated survival benefit, while low-risk patients often receive RAI without clear oncologic advantage.

These patterns have implications for patient outcomes, healthcare equity, and resource stewardship. Surgeons occupy a pivotal role in addressing these gaps through risk-informed decision-making, early multidisciplinary coordination, and advocacy for equitable care pathways.

Aligning RAI use with NCCN guidelines represents a tangible opportunity for surgeons to influence outcomes beyond the operating room. These guidelines are a practical opportunity to improve outcomes, reduce disparities, and deliver high-value, evidence-based cancer care. B

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Dr. Darryl Weiman

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How Does AI Augment Surgeon Judgment and Creative Thinking Skills?

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It is clear that artificial intelligence (AI) is positioned to make significant contributions to surgical care and training.

AI USES ALGORITHMS that allow computers to make predictions and solve problems by recognizing words, analyzing patterns, shapes, and colors in images, identifying patterns in data, and detecting correlations and anomalies in statistics.

Several companies are investing billions of dollars to solidify their spot in the AI market. Microsoft, Apple, Nvidia, Google (Alphabet Inc.), OpenAI, Amazon (Alexa), IBM, and xAI (Grok) are just a few of the companies that have made significant investments in this technology, as the potential financial return for these tools is tremendous.

While many AI algorithms are proprietary and private, many others are developed within the open-source community and are available for public review. Absent a change in the US Constitution, these algorithms likely will be protected for some time.

While a considerable portion of AI's algorithmic logic remains outside public knowledge, what we do know is the fact that powerful computers in the AI realm collect data from large databases in order to formulate predictions.

Is it possible that AI will eventually replace human physicians?

Unfortunately, AI output can be low quality and inaccurate due, in part, to faulty data. Garbage in, garbage out, is a common observation made by the AI community.

Several articles confirm that AI platforms are making mistakes. In a 2025 *Los Angeles Times* column, the author described AI-generated results that provided false precedents used by lawyers in supporting their cases. When the judges found the precedents had not been checked by the lawyers, fines and other punishments were levied. Another example of what has become known as "AI slop" occurred when a Texas professor flunked his entire class after an AI program erroneously accused all the students of plagiarism.

Conversely, AI has proven to be useful in diagnostic specialties where it can learn to recognize patterns and detect anomalies or markers by analyzing vast libraries of visual images and videos. Specialties such as radiology, pathology, and dermatology have shown that AI can review images and recognize visual factors that the physician may have missed.

With this in mind, is it possible that AI will eventually replace human physicians?

This question was recently raised with a retired IBM executive. The executive assured us that Watson, the IBM AI representative, is meant to help us do our job better. In the diagnostic specialties, this seemed to be a reasonable answer. We then asked if a computer could ever affect a surgeon's creativity, namely the skills necessary to respond to unexpected events due to an overreliance on AI algorithms? As it so happens, she was reluctant to make predictions regarding the use of AI-driven ideation.

We entered the same query into a Google search, and this was the response:

"Concerns that AI could stifle a surgeon's creative training by removing complex problem-solving are valid, though current research suggests a more nuanced outcome. AI is expected to serve as a supplementary tool in surgical training, automating standard tasks and providing realistic simulations, which can help accelerate skill acquisition. However, the human aspects of surgical creativity—including the ability to respond to unexpected intraoperative events and innovate new techniques—will remain critical for developing a surgeon's full expertise."

The potential for AI integration to diminish the knowledge, creativity, and skills of a surgeon was recently addressed by Abiodun Adegbesan, MD, MPhil, with the Department of Public Health and Primary Care at the University of Cambridge in England, and colleagues, in a letter to the editor of a medical journal, which stated, in part, "…there is a danger that surgeons may become passive operators which can potentially lead to a reduction in their surgical dexterity, clinical expertise, and overall problem-solving abilities."

Generative AI

ChatGPT is an advanced AI language model developed by OpenAI. It is a generative pre-trained transformer that "learns" from internet data to perform tasks such as answering questions, summarizing information, and writing papers.

In a recent article by Keith S. Naunheim, MD, FACS, and Mark Ferguson, MD, FACS, four popular chatbots were tested against 21 board-certified thoracic surgeons in 10 clinical scenarios. The surgeons performed at a significantly higher level than the chatbots. In this study, the authors concluded that "[a]lthough they are becoming increasingly sophisticated, chatbots do not yet perform at the level of a practicing thoracic surgeon when faced with complex

It may very well be just a matter of time before the computer can surpass surgeons in making diagnoses and formulating treatment plans.

clinical scenarios." It would be interesting to see how the chatbots perform against thoracic surgical residents who have not yet garnered the experience of the certified surgeons.

In a world that has already seen computers beat human opponents at Jeopardy (IBM's Watson) and Grand Masters at Chess (IBM's Deep Blue), it is somewhat surprising that several chatbots were not able to outperform the board-certified thoracic surgeons in vignettes relating to well-known clinical scenarios. It may very well be just a matter of time before the computer can surpass surgeons in making diagnoses and formulating treatment plans.

Enhancing Robotic Dexterity

At this time, robots cannot be programmed to independently perform operations as well as surgeons can due to the fact that robotic arms and graspers are limited in their physical ability. Human hands are superior to any known robot platforms, but this difference is being challenged.

At Northwestern University's Center for Robotics and Biosystems in Evanston, Illinois, researchers are working on improving tactile sensing and flexibility of robotic hands. Kevin Lynch, professor of mechanical engineering and director of the center, has shared, "The team has set a 10-year goal to achieve dexterity sufficient for basic humanlike tasks."

Engineers at Tesla also are working to improve their humanoid robot, Optimus, so that it will be capable of "performing the small, precise motions that define most skilled labor." As Elon Musk told *The Wall Street Journal*, "In order to have a useful generalized robot, you do need an incredible hand."

But what about the creative skills that are essential for any surgeon facing a rapidly changing and challenging environment in the OR? Can these spontaneous, problem-solving skills be programmed into the AI platform?

Creative problem-solving also is paramount for job performance in other fields. In a military context, for example, war gaming is essential in training intelligence professionals. A quote from President Dwight Eisenhower is particularly relevant in this context: "Plans are worthless, but planning is everything."

A recent article developed by the Combating Terrorism (CT) Center at the US Military Academy West Point in New York, suggested that AI may result in overreliance on this technology by special operators who need to be creative and quickly responsive to sudden changes on the battlefield.

"While generative AI may assist in automating routine tasks, it lacks the capacity for nuanced judgment, uncertainty quantification, and dynamic responsiveness critical to effective CT work. The use of generative AI for operational planning may, in fact, make our planners worse by removing the real benefits of the planning process and limit the CT forces' ability to respond dynamically to branches and sequels," the article stated.

But what about doing operations without human control? Could the surgical robots with AI platforms be programmed to do operations by themselves? Robotic operations are being done by humans around the world daily. The operations are being done with surgeons at a console, controlling the robot arms. So far, the critical difference is that the surgeon controls the robot arms and has hands, which the robot does not. If things go bad, the surgeon can abort the robotic procedure, open the patient, and complete the operation in the conventional way.

Can the computer be programmed to learn when it is over its head and abandon

the robotic procedure? If faced with circumstances that are not answerable with the database provided (i.e., aberrant anatomy, arterial bleeding, hollow viscus injury), could the computer be creative and provide a solution? How can creativity be programmed? This is a difficult question because we do not know how to define "creativity," and we do not understand the process of being creative in the first place.

When circumstances in the operating room change, the surgeon generally has the knowledge, education, experience, and skills to adjust appropriately. They may need to call in a colleague, which is part of being a professional. Could AI act professionally and be creative if the circumstance calls for it? At our present state of knowledge, if creativity is required, it is unlikely that a computer can replace a human surgeon. However, as AI platforms continue to improve, they may enhance simulation exercises, but this should be extrapolated to live surgery with caution. As the retired IBM executive stated, "AI computers are meant to help us, not replace us."

Medical education and surgery are growing at a rapid pace. Being creative and using judgment to adapt to rapidly changing circumstances are often the difference between life and death. AI should only be used when its strengths outweigh its weaknesses. We must continue to train our surgeons to be creative and resourceful to better help our profession grow and keep us at least one step ahead of AI and robots. B

The sole AI-generated portion of this article is the response provided to the Google search query.

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United States Constitution, Article I, Section 8, Clause 8. The Congress shall have Power…To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.

New Sentinel Event Reporting System Advances Surgical Learning, Practice Improvement

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

In January, Joint Commission and the National Quality Forum (NQF) released a major update aligning Joint Commission's Sentinel Event framework with the updated 2025 NQF Serious Reportable Events (SRE) list.[1]

FOR SURGEONS, this alignment represents a meaningful shift in how serious adverse events are defined, reviewed, and used to guide learning.

Surgeons and the healthcare institutions in which they practice have long functioned under overlapping event-reporting frameworks—the state-mandated NQF SRE list, Joint Commission sentinel events, and internal quality systems that were not always in sync. This updated approach provides a single framework built around 28 SREs focused primarily on significant, harmful, and largely preventable patient events.

For surgeons and their teams, this new framework matters because many core surgical safety events—wrong-site surgery, retained surgical items, anesthesia-related harm, and intraoperative fires—are now defined using clear, standardized language. Events that were once described slightly differently depending on the reporting destination are now aligned under a single taxonomy, reducing confusion and administrative burden for healthcare practitioners and organizations alike.

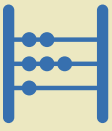
One of the most important changes for surgeons is the expanded use of the designation "regardless of the outcome" for a limited number of procedural events. For example, wrong-site surgery and retained surgical items must be evaluated and reported—even when caught early and/or when no patient harm ultimately occurs.

This modification is not a move toward punitive oversight. Rather, it reflects a system safety approach. If a breakdown in surgical processes occurs—even one corrected before any harm takes place—it signals a vulnerability worth understanding. For surgeons, this safety mechanism reinforces the value of near-miss reporting as a professional responsibility that protects patients and strengthens team reliability.

Surgeon Takeaways: What's Changed—and Why It Matters

One aligned framework

Joint Commission's Sentinel Event list adopts the 2025 NQF SRE list, reducing administrative burden.



Near-misses count

Wrong-site surgery and retained surgical items are reviewed regardless of outcome, reinforcing system learning—instead of assigning blame—when errors are caught early.

All settings included

Surgical safety expectations consistently apply across hospitals, ambulatory surgery centers, and office-based procedural settings.

Clearer reviews

Standardized definitions and clinical application guidance help distinguish preventable system failures from known complications.

Focus on improvement

Reporting of sentinel events to Joint Commission remains voluntary, with emphasis on root cause analysis and preventing recurrence—not punitive oversight.

SREs Relevant to Surgeons

While all SREs should be considered appropriate to surgical practice, the following SREs are of particular relevance to surgeons:

SRE 1.	Surgery or other invasive procedure performed at the wrong site, on the wrong patient, or that is the wrong procedure, regardless of the type of procedure or the outcome
SRE 2.	Unintended retention of a medical or surgical item in a patient after surgery or other invasive procedure, regardless of the type of procedure or the outcome
SRE 3.	Patient harm associated with perioperative or periprocedural sedation of an ASA Class I or ASA Class II patient
SRE 8.	Patient harm associated with the use of contaminated drugs, devices, or biologics
SRE 9.	Patient harm associated with the use or function of a medical device in patient care, in which the device is used or functions other than as intended
SRE 10.	Patient harm occurring when systems designated for oxygen or other gas to be delivered to a patient contain no gas, the wrong gas, or are contaminated by toxic substances
SRE 11.	Fire, flame, or unanticipated smoke, heat, or flashes occurring during direct patient care caused by equipment operated and used by the healthcare setting, regardless of the outcome
SRE 18.	Patient harm associated with an unintended burn from any source
SRE 19.	Patient harm associated with a medication error
SRE 20.	Patient harm associated with unsafe processing or administration of blood products

Expanded Settings Reflect Current Surgical Settings

More than 80% of surgeries in the US are now performed in an outpatient setting,[2] and an increasing number of major surgical procedures (e.g., cholecystectomies, appendectomies, joint replacement surgeries) are performed using minimally invasive methods, with patients discharged the same day or after a minimal in-hospital stay.

This reality is particularly important because the surgeon frequently does not monitor and evaluate the patient on a daily basis after surgery and therefore could miss an important sentinel event. The updated SRE framework applies across all care environments, including ambulatory surgery centers, office-based procedural settings, and other locations where invasive procedures increasingly occur.

For surgeons who practice outside the hospital OR—particularly in outpatient and procedural suites—this shift ensures that safety-related expectations now travel with the procedure, not the building. The same standards for site verification, device safety, sedation monitoring, and specimen handling apply regardless of setting, creating a more consistent safety culture for surgeons and patients alike.

The revised list also includes an updated SRE related to patient harm from perioperative or periprocedural anesthesia or sedation in low-risk (American Society of Anesthesiologists [ASA] classification I–II) patients, recognizing that serious harm in these cases is often preventable when established clinical standards are followed.

For surgeons, this emphasizes shared accountability across surgical and anesthesia teams. It also reinforces the importance of role clarity, readiness to rescue, and standardized approaches to procedural

Each SRE now includes detailed clinical application guidance designed to reduce ambiguity in determining whether an event qualifies as an SRE.

sedation—particularly in settings where surgeons may work with anesthesia colleagues less frequently than in traditional OR environments.

Surgical Review Is More Consistent

Each SRE now includes detailed clinical application guidance designed to reduce ambiguity in determining whether an event qualifies as an SRE. This guidance helps reviewers distinguish between known complications and preventable system failures—a distinction surgeons value when participating in peer review and quality improvement.

For practicing surgeons, this guidance means event reviews should function in a more clinically grounded, less-subjective manner that is aligned with how surgical care actually unfolds. The focus of the review is explicitly on learning and improvement, not blame.

The new sentinel event reporting system focuses on:

- Fewer reporting silos and more consistent definitions across accreditation, state, and institutional systems
- Emphasis on near misses, particularly for wrong-site, wrong-procedure, and retained-item events to reveal system gaps before harm occurs
- The same safety expectations for outpatient and office-based surgery, as with hospital practice
- Peer-review discussions that provide clarity, are more clinically meaningful, and are supported by standardized guidance

Bottom Line for Surgeons

This new approach does not change the fundamentals of safe surgical practice; rather it aims to clarify expectations, reduce duplication, and strengthen the link between reporting and meaningful patient safety improvement. For surgeons, it represents a more coherent safety framework that aligns professional judgment with national standards, allowing them to focus less on navigating reporting systems and more on preventing harm at the bedside and in the OR. B

Disclaimer

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

Dr. Lenworth Jacobs Jr. *is a professor of surgery at the University of Connecticut in Farmington and director of the Trauma Institute at Hartford Hospital in Connecticut.*

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New NCDB Data Reveal Shifting Patterns in Cancer Treatment and Outcomes

Elizabeth B. Habermann, PHD, MPH
Courtney N. Day, MS
Bryan E. Palis, MA
Judy C. Boughey, MD, FACS

THE CANCER DATA MODELING PILLAR of the ACS Cancer Research Program (ACS CRP®) aims to use available data to evaluate and describe the current state of cancer care delivery, as well as guide patient-specific surgical and comprehensive cancer care decisions.

A recent article published online in the *Journal of the American College of Surgeons (JACS)*[1] highlights observations and trends in cancer diagnoses, patient demographics, and treatments using data from the 2022 National Cancer Database® (NCDB®) Participant User File (PUF). Specifically, the authors of the article examined changes in neoadjuvant systemic therapy use in solid tumors with a focused analysis on esophageal, melanoma, and prostate cancers. This article and the PUF on which it is based follow the first annual report from the 2021 NCDB PUF (published in *JACS* in early 2025[2] and highlighted breast, colon, and pancreatic cancers).

The NCDB is a clinical oncology registry that collects data available at Commission on Cancer (CoC) hospitals. The current report highlights the patient demographics, treatments, and outcomes of 1,331,740 adult cancer diagnoses in the US that were reported to the NCDB in 2022. Data added in 2022 were provided by 1,250 CoC hospitals and cover an estimated 74% of all patients with cancer diagnoses across the US.[3]

These findings serve as a resource for clinicians and researchers to understand trends and generate hypotheses for further study using the case-level PUF.

The five most common cancers in the 2022 NCDB PUF included breast, prostate, lung (bronchus—non-small cell carcinoma), colon, and melanoma of the skin.

The PUF report describes key quality improvement metrics, including operative mortality, inpatient length-of-stay trends, and the association between first-course treatment and long-term outcomes stratified by biomarkers. These findings serve as a resource for clinicians and researchers to understand trends and generate hypotheses for further study using the case-level PUF.

The annual reports are based on an analysis of data from each subsequent year of PUF and are intended to facilitate a broader understanding of changes in cancer practices and outcomes for cancer clinicians, researchers, and patients.

Systemic Therapy

The NCDB captures the first course of treatment for cancer patients, including systemic therapy, surgical procedures, and radiotherapy. The 2022 annual report includes a closer focus on rate of use of neoadjuvant systemic therapy, which integrates systemic disease control (to minimize distant disease); surgical optimization (often increasing resectability and/or decreasing extent of resection required); and biologic insight (to guide additional therapies).

This PUF report demonstrates that use of systemic therapy as the first course of treatment (i.e., neoadjuvant systemic therapy) has increased in recent years for several solid tumors—most notably for pancreatic cancer, selected female genital organ-related cancer, and peritoneum, omentum, and mesentery tumors.

Use of systemic therapy in patients with pancreas cancer increased from 11.6% in 2010 to 39.8% in 2022. Both selected female genital organ tumors and those of the peritoneum, omentum, and mesentery had similar increases from 7.3% and 22.5% to 34.0% and 46.8%, respectively. Esophageal cancers had a smaller increase of neoadjuvant systemic therapy use from 55.4% to 63.7% over the same time period.

Esophageal Cancer

The NCDB files include 240,024 cases of esophageal cancer diagnosed from 2004 to 2022. Of these, 14,207 adult patients diagnosed with esophageal cancer were reported to the NCDB in 2022, at a median age of 68 years. Most patients were White (83.9%) and insured by Medicare (59.9%). Although squamous cell histology is most common in most geographic regions,[4] the distribution of histology in the US differs: the NCDB reports most esophageal patients (74.8%) had adenocarcinoma histology.

Only 29.5% of patients were surgically treated, likely due in part to roughly half of patients presenting with stage IV disease. Esophageal cancer is treated at select facilities; in fact, more than 90% of facilities reporting to NCDB saw 25 or fewer cases in 2022. Esophagectomy decreased from 28.6% of esophageal cases in 2018, to 24.8% in 2022; this decrease was observed in both high- and low-volume centers.

While the median number of surgically treated esophageal cancers per facility was two in 2022, one-third were treated at facilities reporting more than 25 cases per year. Use of both chemotherapy and radiation therapy were high (73.4% and 61.6%, respectively), and immunotherapy use increased—from 7.8% in 2018 to 29.5% in 2022 (p <0.001). While length of stay slightly decreased for patients undergoing esophagectomy over the past 5 years, from 9 days in 2018 to 8 days in 2022; readmission and mortality remained stable.

Melanoma

The NCDB files include 963,415 cases of melanoma diagnosed from 2004 to 2022, including, 65,546 new primary melanoma cases reported to the NCDB in 2022. Melanoma is the least-represented cancer in the NCDB at 52.0% of the estimated total melanomas in the US,[3] likely due to the large variety of clinical settings where melanomas may be diagnosed or treated, including many outpatient clinics.[5]

Roughly half (46.3%) of melanomas were diagnosed at stage I; there have been no substantial shifts in stages at diagnosis of melanoma in the past 5 years of NCDB reporting (2018–2022). Melanomas were most frequently diagnosed at the site of trunk (30.3%), followed by upper limb and shoulder (25.1%).

Site-specific characteristics of melanoma available in the NCDB include presence of ulceration present in 19.3% of invasive melanomas and Breslow thickness (median 0.9 mm in 2022); notably, these characteristics are not observable in administrative data culled from billing records.

Most patients with melanoma underwent surgery (93.5%); while the majority of patients underwent wide local excision of the lesion (60.3%), less than 4% underwent Mohs surgery, the use of which has been stable over recent years. The NCDB showed an increase in the use of immunotherapy for melanoma over the past few years (from 12.4% in 2018 to 17.5% in 2022, p <0.001, while use of chemotherapy and radiation remained low (≤3%).

Poorer survival was associated with higher clinical stage as well as presence of ulceration; with respect to tumor site, melanomas of the scalp and neck had the poorest long-term survival.

Prostate Cancer

The NCDB files from 2004–2022 contain data on a total of 2,320,369 prostate cancer diagnoses, of which 144,147 were identified in NCDB data in 2022. Patients were diagnosed at a median 68 years, and roughly three-quarters (74.5%) were White.

Prostate cancer-specific characteristics available in NCDB include prostate-specific antigen (median 7.6 ng/mL in 2022) and Gleason score. Similar to what is noted earlier in this article for melanoma's site-specific variables, these characteristics are not observable in administrative data culled from billing records.

In 2022, the majority of men (61.5%) diagnosed with prostate cancer did not undergo surgical treatment, up from 53.5% in 2018, reflecting a recent trend of surveillance for low-risk prostate cancer. Nonsurgical treatments remained common, with 38.1% of patients receiving radiation therapy for prostate cancer in 2022 and 35.5% hormone therapy. Interestingly, radiation therapy has become more common for treatment of stage IV prostate cancers and less so for stage I. Chemotherapy and immunotherapy both increased over the years between 2018 and 2022.

Looking Ahead

The next annual report describing the 2023 NCDB PUF is currently being prepared as the ACS CRP continues to disseminate highlights and insights from each year's PUF release. Each annual report will include overviews of three different cancers; furthermore, work is underway on a pediatric cancers special report, supporting the ongoing goal to inform cancer clinicians, patients and others of trends in cancer diagnoses, care delivery, and outcomes in the US. B

Dr. Elizabeth Habermann *is a professor of health services research at the Mayo Clinic in Rochester, MN, where she also serves as deputy director of research in the Mayo Clinic Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery and the Robert D. and Patricia E. Kern Scientific Director for Surgical Outcomes. She is Chair of the ACS CRP Cancer Data Modeling Pillar.*

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Dr. Jeffrey Kerby Is ACS Medical Director, Trauma Education

JEFFREY D. KERBY, MD, PhD, FACS, from Birmingham, Alabama, is the ACS Medical Director, Trauma Education. Dr. Kerby begins this new, part-time executive leadership position on March 16, when his 4-year term ends as Chair of the ACS Committee on Trauma.

A globally esteemed trauma surgeon, researcher, and US Air Force veteran, Dr. Kerby will help shape domestic and international trauma care by providing strategic, clinical, and scientific guidance for key ACS trauma education initiatives.

After earning his medical degree from the University of Missouri–Kansas City, Dr. Kerby completed his general surgery residency, research fellowship, and PhD in biochemistry and molecular genetics at The University of Alabama at Birmingham (UAB). Upon completion of his training in 1999, Dr. Kerby served as an active-duty Air Force surgeon for 4 years, returning to UAB in 2003 as a member of the surgical faculty.

An ACS Fellow since 2001, Dr. Kerby currently is a professor of surgery and director of the UAB Division of Trauma and Acute Care Surgery in the Department of Surgery at the UAB Heersink School of Medicine (UABSOM). He holds the Brigham Family Endowed Chair in Trauma Surgery at UAB and has been recognized as a Distinguished Professor in the UABSOM. Dr. Kerby also serves as the state trauma consultant for the Office of Emergency Medical Services in the Alabama Department of Public Health.

For nearly 20 years, Dr. Kerby conducted National Institutes of Health-funded research evaluating resuscitation strategies and devices in both out-of-hospital cardiac arrest and severe traumatic injury.

This research has included large-scale randomized trials evaluating hypertonic saline for shock and traumatic brain injury, balanced blood product transfusion for hemorrhagic shock, and pilot studies evaluating a limited resuscitation strategy for hemorrhagic shock. He also is actively involved in multidisciplinary outcomes research through the UAB Center for Injury Science.

A much sought-after speaker, mentor, and advisor, Dr. Kerby is a prolific author and serves on editorial boards and/or as a reviewer for numerous scientific journals, including *The Journal of Trauma and Acute Care Surgery, JAMA Surgery,* and the *Journal of the American College of Surgeons.* B

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ACS Launches Online Resources on Surgeon Unionization

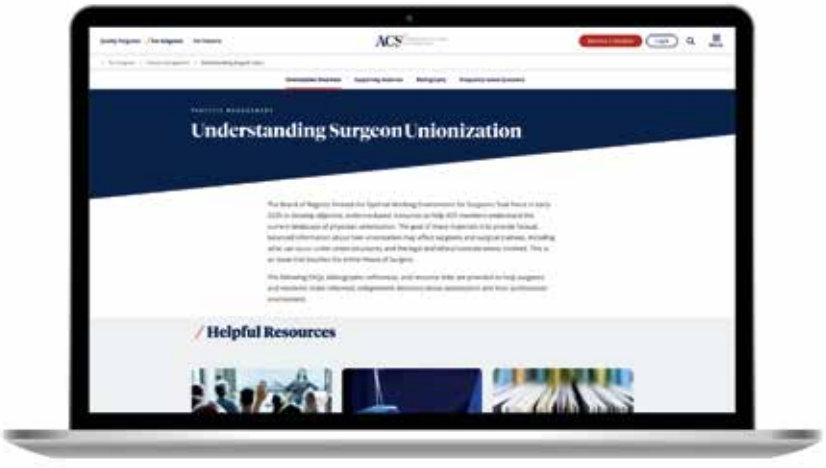
A NEW SECTION FOCUSED on physician unionization is now available on *facs.org*, providing ACS members with objective, evidence-based information on an issue of growing interest across the surgical community.

The resources were developed following publication of the article "Is It Time for Surgeons to Unionize?" in the November-December 2024 ACS *Bulletin*, which prompted feedback from Fellows and members seeking additional information on the topic.

In response, the ACS Board of Regents established the Optimal Working Environment for Surgeons Task Force in early 2025. The group was charged with developing factual, balanced materials to help surgeons and surgical trainees better understand the current landscape of physician unionization.

The goal of the unionization materials is to provide factual, balanced information about how unionization may affect surgeons and surgical trainees, including what can occur under union structures, and the legal and ethical considerations involved. This is an issue that touches the entire House of Surgery. FAQs, supporting materials and bibliographic references are provided to help surgeons and residents make informed, independent decisions about unionization and their professional environment.

This new resource, in the Practice Management section of *facs.org*, will be updated periodically. Please note that the ACS is not endorsing the union concept or creating a union; the College is only providing resources.



Nominate Colleagues for Prestigious ACS Awards by April 10

The ACS invites members to nominate colleagues for six prestigious awards.

Honors Committee

NOMINATIONS OF CANDIDATES from all surgical disciplines and geographical locations are highly desired for all awards.

The Honors Committee, which administers the awards, will review the nominations and send them to the Board of Regents for final approval.

Submissions are accepted throughout the year and considered for selection annually (see sidebar).

Nominations must be received by **April 10** in order to be included on the next Honors Committee meeting agenda. Nominations received after that date will be held for future consideration.

Visit the Honors Committee web page for award criteria and instructions for submitting a nomination.

Note: Nominations do not guarantee selection, and not all awards or honors are presented annually.

2025–2026 Honors Committee Members

- Anton N. Sidawy, MD, MPH, FACS, Chair
- Timothy J. Eberlein, MD, FACS
- Diana Farmer, MD, FACS, FRCS
- James W. Fleshman Jr., MD, FACS
- Andrea A. Hayes-Dixon, MD, FACS
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JACOBSON INNOVATION AWARD
Recognizes surgeon-scientists whose pioneering work has had a global impact in advancing surgical science and patient care

LIFETIME ACHIEVEMENT AWARD
Recognizes surgeons for their outstanding contributions to the art and science of surgery and a lifetime of service

SHEEN AWARD
Recognizes a surgeon-educator or surgeon-scientist on the frontiers of medical science performing work and research that has great promise

Member News

Turner Receives SUS Trailblazer Award

Patricia L. Turner, MD, MBA, FACS, was honored with the Society of University Surgeons (SUS) Trailblazer Award. This award recognizes leaders who have established new avenues of investigation, often in areas beyond traditional surgical research, acting as role models for future generations. Dr. Turner, a general surgeon and the ACS Executive Director and CEO, received the award during the 21st Annual Academic Congress in Orlando, Florida—a joint meeting of SUS and the Association for Academic Surgery.

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.

Ritch Chairs Urology at Cleveland Clinic Florida

Chad R. Ritch, MD, MBA, FACS, is chair of the Division of Urology at the Cleveland Clinic Florida in Weston. A nationally recognized urologic oncologist, Dr. Ritch brings expertise in bladder, prostate, and kidney cancer and a focus on robotic-assisted surgery. He previously served as professor of urology and director of the Society of Urologic Oncology Fellowship Program at the University of Miami Miller School of Medicine in Florida.

Ferrada Serves as EAST President-Elect

Paula A. Ferrada, MD, FACS, has been elected president-elect for the Eastern Association for the Surgery of Trauma (EAST). She formally will become EAST president in January 2027 and serve a 1-year term. A trauma surgeon, Dr. Ferrada is chair of the Department of Surgery at Inova Fairfax Hospital in Falls Church, Virginia, and chief of the Division of Trauma and Acute Care Surgery. She currently serves as an ACS Governor-at-Large.

Wilson Leads General Surgery in Virginia

Jason P. Wilson, MD, MBA, CPE, FACS, is the general surgery clinical chief for Sentara Surgery Specialists at Sentara Health Medical Group in Hampton, Virginia. Previously, Dr. Wilson, who is a surgical oncologist, served as the oncology service line medical director at Sentara Health. He is a member of the SurgeonsPAC Board of Directors.

Badhwar Is Elected STS President

Vinay Badhwar, MD, FACS, is the new president of The Society of Thoracic Surgeons (STS). Dr. Badhwar—a cardiothoracic surgeon—is executive chair of the West Virginia University (WVU) Heart and Vascular Institute and the Gordon F. Murray Professor and Chair of the Department of Cardiovascular and Thoracic Surgery at the WVU School of Medicine in Morgantown, West Virginia.

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