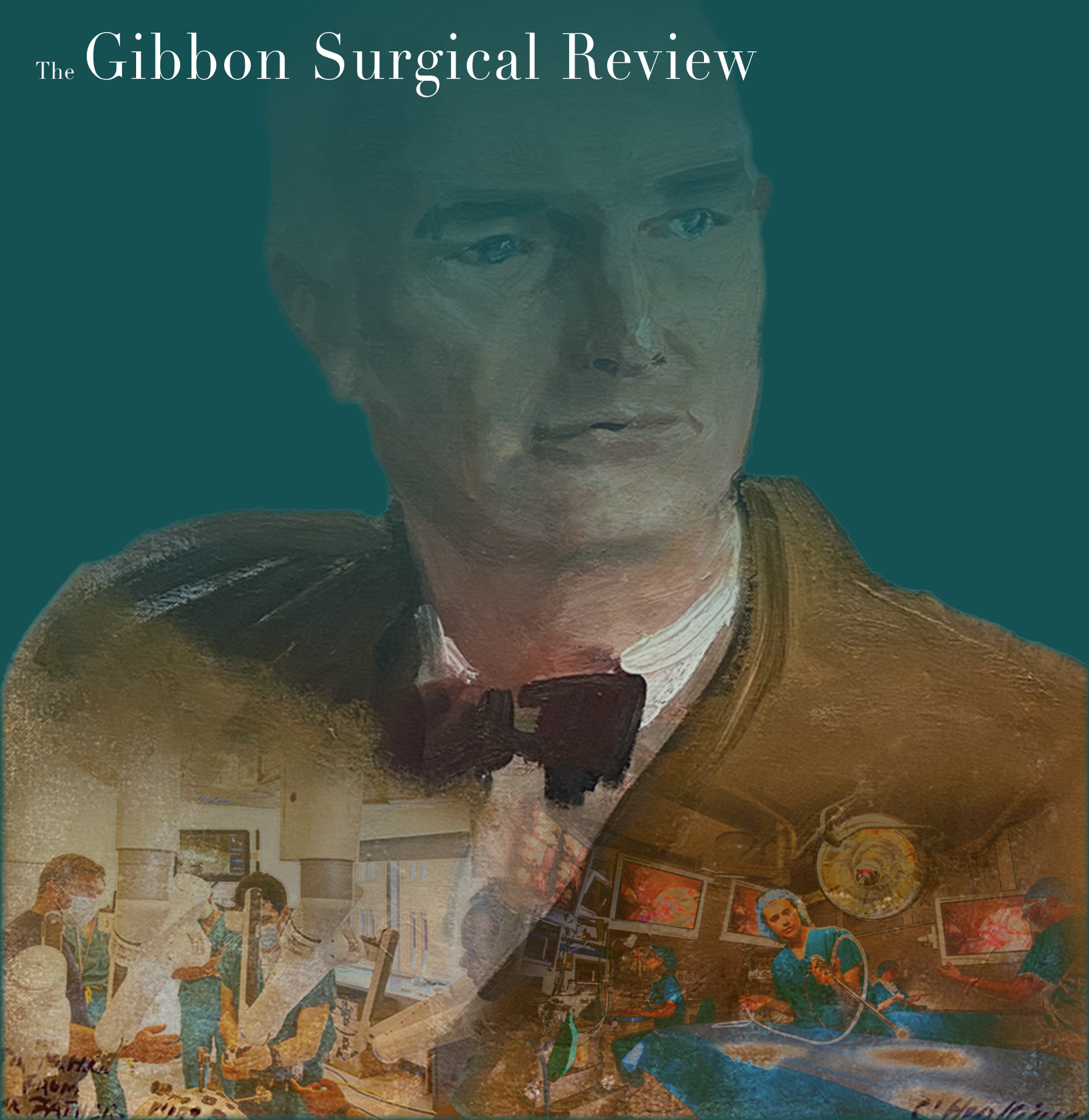


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# GSR

The Gibbon Surgical Review







# John H. Gibbon Jr., MD

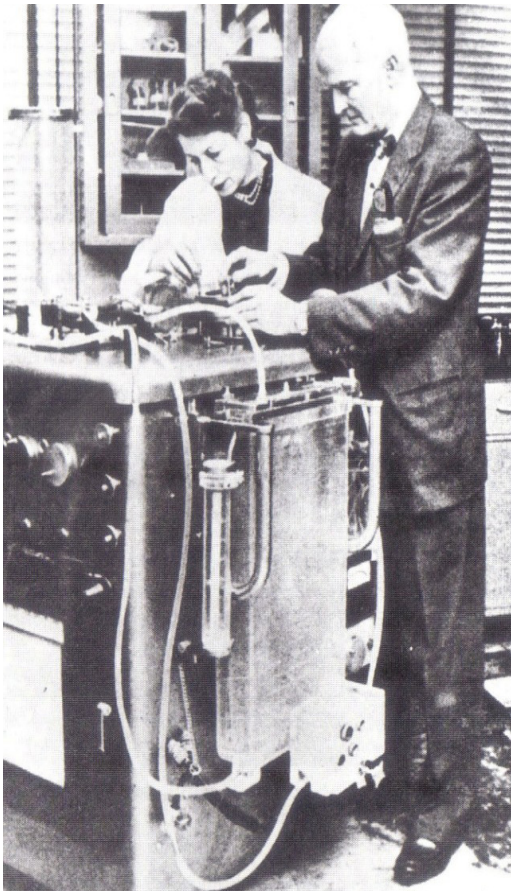
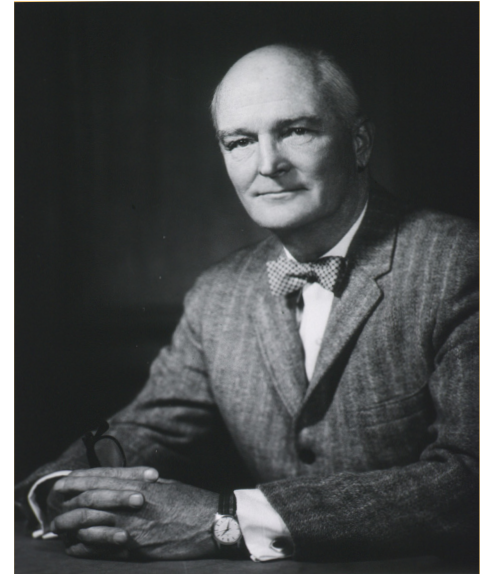
Dr. John Heysham Gibbon, Jr. graduated from Jefferson Medical College in 1927, and after an internship at Pennsylvania Hospital, began a research fellowship at Massachusetts General Hospital. In 1930, he assisted Dr. Edward Churchill in an emergency pulmonary embolectomy. At that time, the procedure was desperate, as no patient in the U.S. had survived the removal of blood clots in open-heart surgery. As Dr. Gibbon recorded the patient's waning vital signs prior to the procedure, he thought, "If only we could remove the blood from her body by bypassing her lungs, and oxygenate it, then return it to her heart, we could almost certainly save her life." Despite successfully removing large clots from the patient's pulmonary artery, the patient never regained consciousness. This "critical event" initiated Dr. Gibbon's determination to produce a heart-lung machine.

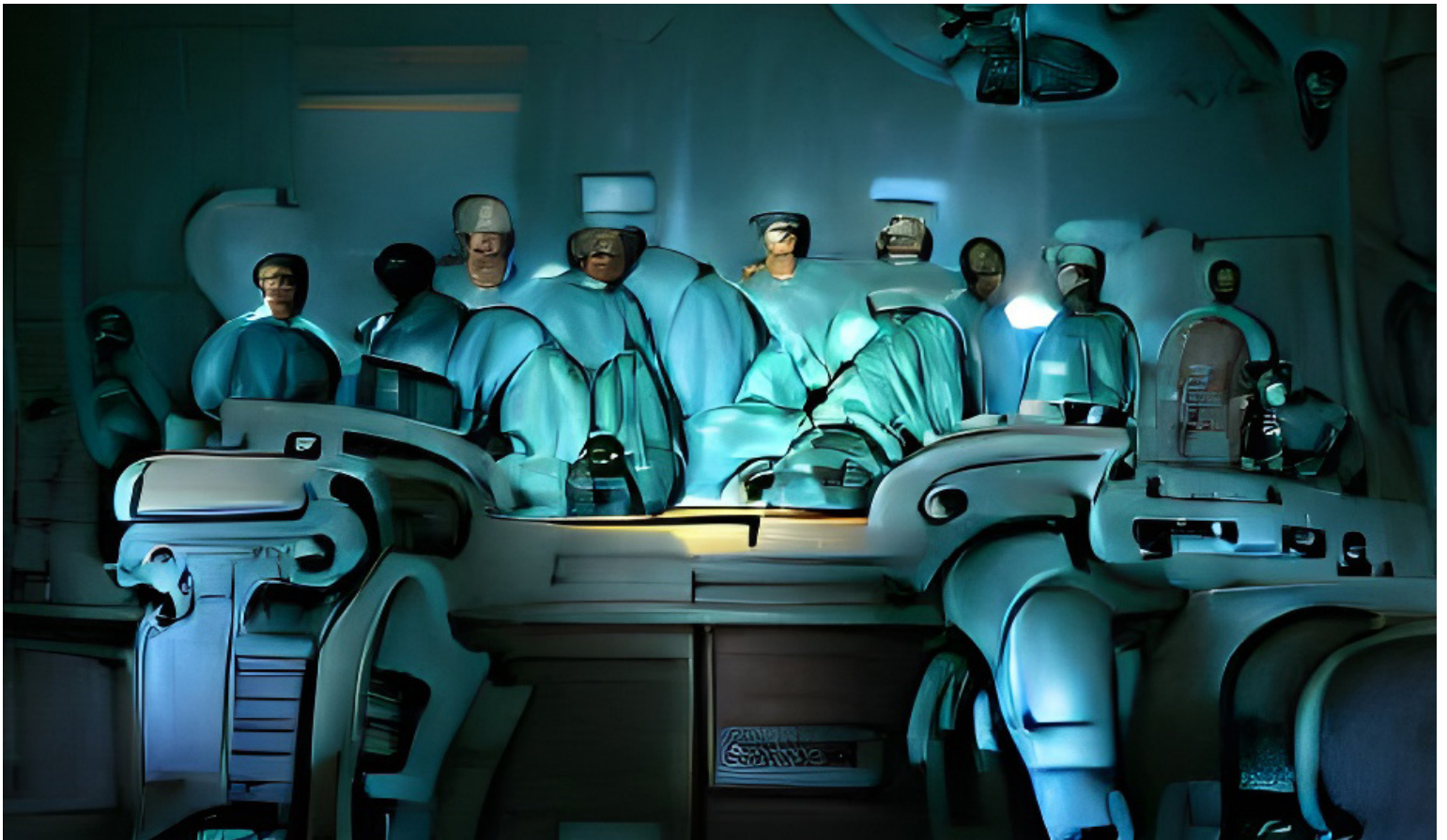
Dr. Gibbon was Chief of Surgical Services at the 364th Station Hospital in the Pacific Theater. After the war, upon returning to Philadelphia, his alma mater offered him the position of Professor of Surgery and Director of Surgical Research, which he accepted. Through Jefferson Medical College's connections, IBM and its premier engineering department entered the picture and worked with Dr. Gibbon to develop a device known as IBM "Model I." His wife, Maly Gibbon, and the Jefferson Medical College surgical residents were also deeply involved in the evolution of this huge apparatus (too heavy for the building's elevators), which proved to be successful in repeated experiments on dogs. However, limitations on the machine for human patients existed. The decision was made to cannibalize parts of Model I for Model II, which

was ready for its first test in February 1952. Although the heart-lung device was fully functional, the first patient, a 15-month-old child, died during the operation. A post-mortem revealed a much larger defect than was suspected.

On May 6, 1953, at Jefferson Medical College Hospital, Dr. Gibbon and his staff, with the help of his latest-designed heart-lung machine, "Model II," closed a severe atrial septal defect between the upper chambers of the heart of 18-year-old Cecelia Bavolek. This was the first successful intra-cardiac surgery of its kind performed on a human patient. "Jack" Gibbon did not follow this epoch-making event by holding an international press conference or by swiftly publishing his achievements in a major medical journal. According to a recent biographical review by C. Rollins Hanlon, "Therein lies a hint of the complex, unassuming personality behind the magnificent technical and surgical achievement of this patrician Philadelphia surgeon." After the triumphant Bavolek case in May of 1953, Dr. Gibbon employed the Model II on two more patients in July 1953. Both children subsequently died, prompting Gibbon to declare a year's moratorium regarding the use of the heart-lung machine, pending investigations into solving clotting problems and blood loss.

During the years leading up to his successful surgery, Dr. Gibbon had been sharing his blueprints and experiences with Dr. John Kirklin at The Mayo Clinic. Eventually, the Mayo Clinic built the "Model III" based on the proposed changes from Dr. Gibbon's lab, which led to several successful operations there. While Dr. Gibbon turned to his non-cardiac interests, others continued to perfect cardiac surgery. It is clear that Dr. Gibbon's contributions to the field of cardiac surgery were necessary for the field to develop, which is why he is often referred to as the "father of cardiac surgery."





**Fig 1 | The New OR.** This image was created by AI artwork generator Nightcafe using written prompts like “surgery” and “robotic surgery.”

## From the Editor-In-Chief

Diana Jimenez, SKMC Class of 2023

In the 1800s, Dr. Samuel Gross performed amputations without anesthesia. In 1942, the medication that changed medicine, Penicillin, was discovered. In 1952 Dr. John H. Gibbon’s famous cardiopulmonary bypass machine was invented. In 1954, Dr. Joseph Murray performed the first successful kidney transplant. As is the case with other medical specialties and other industries, the field of surgery is constantly changing and adapting to the newest technologies and philosophies. In surgery, traditional approaches are replaced by new surgical trends, becoming a part of history. Currently, automation is the new disruptive innovator. Outside of medicine, an Artificial Intelligence (AI) created a painting that won first place in a state art competition. The new AI-powered chatbot ChatGPT is poised to change how we practice medicine and interact with patients.

In this year’s edition of The Gibbon Surgical Review, we focus on depicting the current state of General Surgery, its historical influences, and future directions. Each story showcases the cutting-edge trends and philosophies shaping the surgical narrative, from Dr. Mütter and his museum, to the history of laparoscopy and robotic surgery, to increasing diversity and inclusion in general surgery programs. Additionally, we have interviewed the newest General Surgery faculty at Thomas Jefferson University. Read on for their insights, from what drove them to surgery to where they think their field is heading.

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# Dr. Thomas Mütter's Legacy: The Mütter Museum

By Maxwell Martin, SKMC Class of 2025

Imagine all the cartilage, ligaments, tendons, and connective tissue of a normal skeleton hardening into bone.<sup>1</sup> Then, imagine additional bone growing on top of this hardened structure uncontrollably, with each attempt to remove excess bone resulting in faster and more erratic growth. This impossible-sounding situation was reality for Harry Raymond Eastlack, a man with fibrodysplasia ossificans progressiva (FOP). This disease, caused by mutations in an ossification management gene, affects one in one million people worldwide.<sup>2</sup> Thanks to his courageous donation, Mr. Eastlack's fused skeleton is on display at the Mütter Museum alongside many other incredible artifacts.<sup>1,3</sup>

Dr. Thomas Dent Mütter, the namesake of the Mütter Museum, was a pioneering physician in surgery.<sup>4,5</sup> After graduating with a medical degree at twenty years old, Dr. Mütter traveled by ship across the Atlantic Ocean to Paris, the global center of medicine at the time.<sup>6</sup> In Paris, Dr. Mütter found his calling in a surgical subspecialty French surgeons called "les opérations plastiques." This emerging field is what we now know as plastic and reconstructive surgery. Dr. Mütter saw surgical results that looked like miracles. One of the operations he observed was the removal of a thick horn coming out of the center of a woman's forehead. Dr. Mütter was so fascinated by the surgery that he purchased a wax replica of her pre-surgery head to take home to Philadelphia. His experiences in Paris ultimately motivated him towards daring attempts to fix congenital and acquired

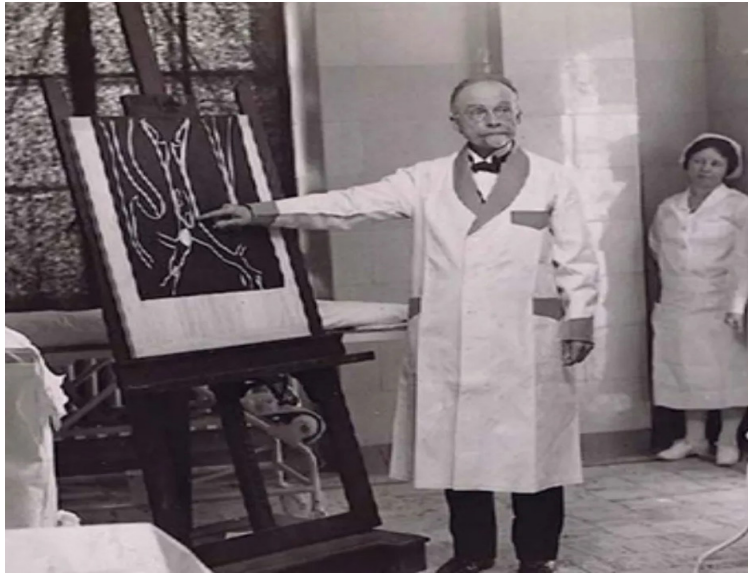
deformities thought irreparable by contemporary American surgeons.

In the late 1830s, after developing his reputation as an excellent surgeon and educator in Philadelphia, Dr. Mütter became Jefferson Medical College's Chair of surgery. He was the youngest new faculty member brought on board. In addition to his unusually interactive classroom environment, Dr. Mütter was well known for bringing fascinating specimens to show his students. He had a real-life example of every possible disease, injury, and problem that students learned about. Throughout his career, Dr. Mütter ultimately amassed one of the most diverse surgical specimen collections of his time.

After fifteen years as a faculty member at Jefferson, Dr. Mütter retired due to a significant deterioration of his health.<sup>7</sup> His final goal was to have his specimen collection safely secured and portrayed for future study.<sup>6</sup> Three months before he passed away, Dr. Mütter signed a contract with the College of Physicians of Philadelphia to relocate his collection that was currently stored at Jefferson Medical College and place his items on display in a museum. The newly built College of Physicians building gained "474 bones, 215 wet preparations, 200 casts, 20 wax preparations, eight papier-mache models, five dried preparations, and four oil and 376 watercolor paintings".<sup>8</sup> As part of the contract, Dr. Mütter requested that the College of Physicians name the museum after him, with free entry for physicians and medical students.<sup>9</sup> This original building at Locust and 13th Streets in



**Figure 1 | Harry Eastlack's Skeleton.** The image shows an overgrowth of bone on top of his skeleton. Looking closely at his elbows, shoulders, and pelvis, the skeleton contains abnormal thick bony protrusions and connections. Courtesy of the Mütter Museum.<sup>14</sup>

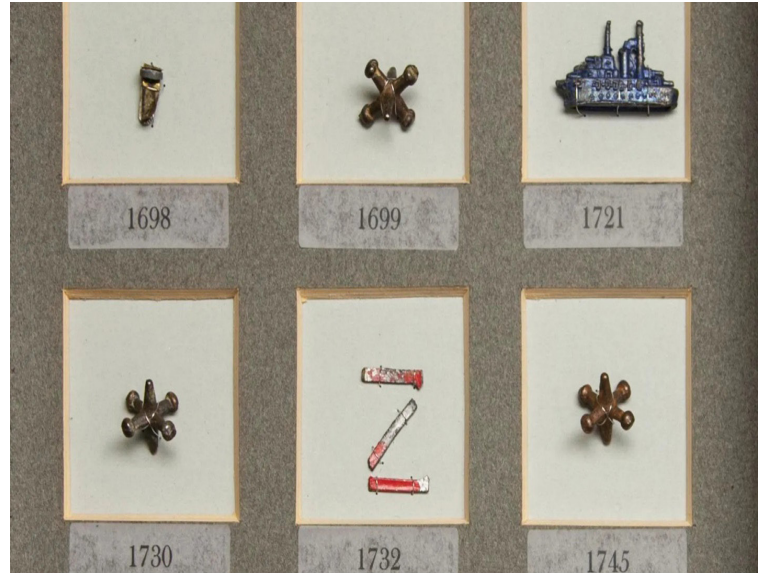


**Figure 2| Dr. Chevalier Jackson Teaching Airway Obstructions.** This image shows him explaining objects lodged into the right main bronchus, the most common spot for an object to obstruct the airway due to its shorter and more vertical orientation. Courtesy of the Mutter Museum.<sup>15</sup>

Philadelphia became the Mutter Museum in 1863.<sup>4</sup> In 1909, the collection from the original building was moved to South 22nd Street, where the current Mutter Museum resides.

Since then, the Mutter Museum has grown significantly, amassing more than 25,000 artifacts thanks to gracious donors. For example, one can see Dr. Josef Hyrtl's skull collection, which comprises 139 different skulls.<sup>9</sup> There are wax models of skin and eye diseases, surgical instruments, an Iron Lung, wet specimens of tumors and cysts, Dr. Chevalier Jackson's collection of swallowed objects, and gallstones on display.<sup>3,10</sup> The Mutter Museum also has temporary exhibits only available for specific periods.<sup>11</sup> At the time of writing, the museum is exhibiting "Dracula and the Incorruptible Body," an enthralling display allowing viewers to see how people in the Victorian era might have mistakenly viewed a corpse as a vampire.<sup>12</sup> In addition to captivating entertainment for the public, the museum also helps researchers advance scientific knowledge. Researchers studying smallpox vaccine strains have been able to recover viral particles for sequencing from Civil War-era vaccine kits held at the Mutter Museum.<sup>13</sup> Henry Eastlack's skeleton, mentioned earlier, is an invaluable resource for researchers studying FOP.<sup>1</sup> Investigators regularly visit the Mutter Museum to associate their laboratory discoveries with the physical artifact.

As a unique resource for medical students, the public, and researchers, the Mutter Museum continues to provide countless hours of entertainment, knowledge, and wisdom. There is something intrinsically different and valuable about learning diseases and ailments from a concrete object. The experience of seeing a disease process in person cannot be replicated in the same way via a textbook or picture.



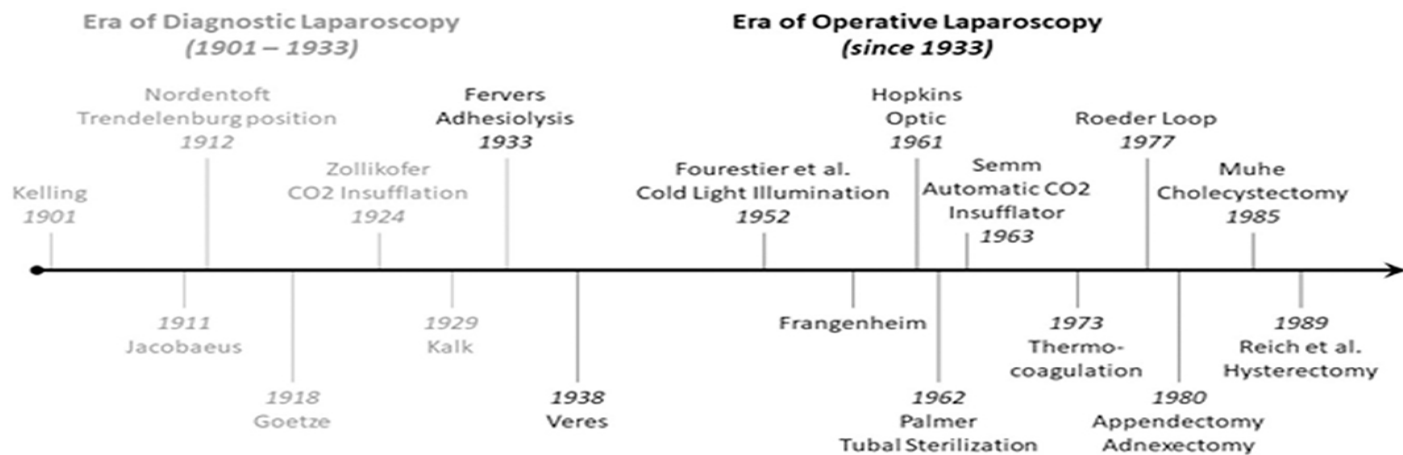
**Figure 3| Dr. Chevalier Jackson's Collection.** Metal toy jacks were a common example of swallowed objects found in 18th century children. Courtesy of the Mutter Museum.<sup>15</sup>

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# The History and Progression of Laparoscopic Surgery

By Emily Yanoshak and Erin Briggs, SKMC Class of 2025



**Figure 1 | Timeline of the Development of Laparoscopy.** This timeline provides a visual representation of the important landmarks in laparoscopic surgery, as well as its transition from diagnostic to operative use. Courtesy of *Frontiers in Surgery Journal*.<sup>3</sup>

For over 7,000 years, the field of surgery has undergone countless transformations.<sup>1</sup> The introduction of endoscopy served as a stepping stone for the development of laparoscopy, and the emergence of minimally invasive surgery (MIS) introduced advantages to surgeons and patients alike. Laparoscopy and endoscopy are from Greek origins—endo-, laparo-, and -skopje—respectively translating to “within,” “soft space between hips and ribs,” and “to examine.” Without the foundations of these essential surgical techniques, newer technological and robotic advancements in MIS would not exist today.

## History of Laparoscopic Surgery

Philipp Bozzini created the original design of the modern endoscope in 1806.<sup>2</sup> His design was ultimately modified by Antonin Jean Desormeaux, who performed the first recorded clinical use of the endoscope in France in 1848 and was subsequently deemed “the Father of Endoscopy.” Ongoing trials for the next half-century led to the first animal laparoscopic procedure in 1901, performed by Georg Kelling. By inflating the abdominal cavity of a dog with gas to investigate the gastrointestinal tract,

Kelling introduced the use of insufflation.<sup>2</sup>

Until 1933, laparoscopy was used exclusively for diagnostic and visualization purposes. Karl Fervers performed the first surgical laparoscopic procedure using electrocautery to divide adhesions. In 1980, Kurt Semm completed the first laparoscopic appendectomy.<sup>2</sup> Almost 80 years after the first animal laparoscopic procedure, many surgeons still did not see the benefit of laparoscopic techniques over successful and established open procedures. Even so, the Society of American Gastrointestinal Endoscopic Surgeons (SAGES) was founded in 1981 in the United States, which solidified the field of MIS in medicine.<sup>2</sup>

## Modern Laparoscopic Surgery

In 1987, French surgeon Philip Mouret performed a laparoscopic cholecystectomy, which would then be presented to the American College of Surgeons in 1989, serving as an opportunity for surgeons worldwide to learn the new technique.<sup>3</sup> The “Laparoscopic Revolution” began with the popularization of laparoscopic cholecystectomy in private practice. Over the



next decade, laparoscopic procedures would revolutionize the field of surgery as surgeons began to utilize the MIS in various cases. By the late 1990s, most major abdominal surgeries were able to be performed by laparoscopic technique.<sup>3</sup>

Laparoscopic surgery typically consists of two to four small incisions in the abdominal or pelvic region, in which trocars are inserted as ports. Following the placement of the first trocar, a gas tube is inserted into the port in order to inflate the cavity. Inflation creates space between the abdominal cavity and the organs within the cavity, making visualization optimal. The laparoscope, a thin rod with a camera attached at the end, then replaces the gas tube. Additional trocars are placed in locations conducive to the specified procedure, and the other surgical instruments are placed within those ports. This technique allows for adequate visualization and performance of surgery while only leaving behind a few 0.5-inch incisions rather than the 6-12 inch incisions required in many open procedures.<sup>4</sup> Benefits of smaller-size wounds include decreased blood loss, reduced risk of intraoperative infection as well as quicker recovery leading to shortened bed rest and reduced risk of blood clots.<sup>5</sup>

## The Future of Minimally Invasive Surgery

Notably, from 2003-2018, rates of laparoscopic surgeries performed in surgical residencies increased by 111%, and the growing popularity paved the way for robotic surgery.<sup>6,7</sup> Robotic surgery was first envisioned in 1986 to improve morbidity and mortality in the military. A benefit of robotic surgery is its ability to perform remotely, as seen in 2001 when the first transatlantic robotic surgery was performed.<sup>7</sup> An advantage of robotic surgery is its ability to solve the problem of the “fulcrum effect” of traditional laparoscopic tools, which arises from the insertion of long and rigid tools, causing lateral motions of the tool handle to be scaled inverted at the tool tip.<sup>7</sup>

According to Dr. Karen Chojnacki—General Surgery Residency Program Director at Thomas Jefferson University—when performing a surgery such as an inguinal hernia repair, the decision between laparoscopic or robotic methods is second to the decision between MIS techniques and open techniques. Dr. Chojnacki explained that anything that can be done laparoscopically could also be done robotically or vice versa. Ultimately, decisions come down to surgeon skillset and comfort. Furthermore, surgeons must be prepared to switch to an open setting when performing MIS procedures should complications arise. In reference to this consideration, Dr. Chojnacki highlighted the importance of resident training in MIS and open techniques, as graduating residents may practice surgery in various settings. Therefore, extensive training in all surgical techniques is critical to be prepared for any future situation.<sup>9</sup>

## Final Thoughts

MIS techniques have allowed surgeons to perform complex cases with decreased blood loss, reduced risk of intraoperative infection, and quicker recovery times compared to open procedures. Based on conversations with surgeons at Jefferson, the usage of specific MIS techniques comes down to factors such as cost, surgeon skillset, comfort, and the availability of surgical technology at local healthcare systems. All-in-all, the ability to perform surgery the ability to perform surgery via minimally-invasive and open approaches is essential.

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# An Interview With Dr. Andrew Morgan



By David Ebbot, SKMC Class of 2024

*Dr. Andrew B. Morgan is the newest member of Jefferson's Colorectal Surgery Department and is a former Jefferson Medical College student. Following graduation, Dr. Morgan completed his general surgery residency across the river in New Jersey at Cooper University Hospital. He then pursued specialty training in colorectal surgery at Cleveland Clinic Florida in Weston, FL. In this interview, Dr. Morgan discusses his field: Why he chose his specialty, the future of colorectal cancer treatment, and how to find balance as an academic surgeon, husband, and father.*

### **What made you decide to pursue general surgery as a specialty?**

I think that in regards to the operating room, some people feel the call, and other people don't. For me, it was my third year on my general surgery rotation. Initially, I thought I would go into a different specialty, but I came with an open mind and was excited about it. My first real experience in the operating room was with a patient that had a Whipple with Dr. Yeo years ago. The patient had an obstruction, and they were able to do a revisional surgery and relieve the obstruction. At the time, I didn't appreciate all the details other than that this person came in with a severe problem and looked pretty ill and was able to go home a couple of days later. I left that day thinking this was what I wanted my career to be like.

### **What made you decide upon colorectal surgery in particular?**

First and foremost, I like the longevity you have with patients in colorectal surgery. There are so many longitudinal aspects that the colorectal surgeon is involved in for their patients; you might do a colonoscopy and diagnose cancer and then remove it, but you also might be managing their lifelong Crohn's disease and perianal complications and things like that. You end up taking care of whole groups of patients and their families. Even early in my career, I could probably count ten families so

far where I've done a colonoscopy on one person in the family in town. Now they've referred their spouses and their parents to me for colonoscopy, hemorrhoids, or Crohn's. I really like that, and I think it's unique to colorectal. Additionally, there's such a breadth of what we treat. I still do a lot of open surgery, as well as robotic and laparoscopic surgery—it's a very even mix. Anorectal surgery is a totally different facet of what we do, but it is another variety. Doing colonoscopies is also one of my favorite things to do. It's like learning a brand new instrument all over again.

**“I still get goosebumps when I walk into the clinic and see my patient looking like a regular person off the street, telling me all the good things they're doing, how happy they are, and how much better they're feeling.”**

## **Is there any particular patient and their story that stands out to you?**

People come to the hospital, and we may not appreciate where they are in life and the impact they can have without realizing it. One of the first patients I treated as an attending was an independent 94-year-old Italian grandmother from South Philadelphia. She had a very large right-sided colon cancer. We were back and forth about what to do. She and I, and her family, had a lot of conversations—should we do surgery or not, at her age? This woman who did all of her activities of daily living, she still cooked family Sunday dinner, and she went to church every Sunday with her daughter. She was 94 and still doing everything. So ultimately, we ended up doing a right-sided right hemicolectomy. She did very well. She's going to get many, many long years with her family and certainly will not succumb to colon cancer by any means. I still get goosebumps when I walk into the clinic and see my patient looking like a regular person off the street, telling me all the good things they're doing, how happy they are, and how much better they're feeling.

## **What is your favorite operation?**

The Altemeier procedure (also known as a perineal rectosigmoidectomy). You can reduce and resect a rectal prolapse transanally. Somehow we are able to do a handsewn coloanal anastomosis with no diversion, and the patients do just fine.

## **What do you see as the future of colon cancer treatment?**

Our understanding of how to treat cancer is exploding at this point. There is never going to be the one-size-fits-all treatment anymore. We are learning more about genetics, immunotherapy, and the microbiome. Do they have one metastasis? Eight metastases? Are they in an anatomical location amenable to resection or radiation? Are they having symptoms from the liver or colon? We can take them to the operating room for either resection. What we will see in the future, even in 2023, is highly individualized, multidisciplinary algorithms. Every patient is not the same. That's the future of what you're going to see. We will have very tailored approaches to increasingly complex oncologic situations.

## **Do you listen to music in the operating room, and what genre?**

I always play the same thing, 'The best of 90s, 2000s, and Today' playlist on Spotify, and I leave it on repeat.

## **What is your biggest hobby?**

I have a three-year-old daughter and another son on the way, so that is my biggest hobby. It's so rewarding to spend time with

family. We promote outdoor activities as much as possible; going to the zoo, hiking, camping, kayaking, and going to the aquarium.

## **How can doctors balance professional with personal and family life?**

It is a conscious, constant effort. It's the way I structure my time outside of the hospital. For example, now I'm studying for my colorectal boards – yes, by the way, the studying never ends— on weekends, I'll spend half the day studying and half the day with my daughter or family or at an event. You have to make that a priority. If your priority was traveling or trying the best restaurants in Philadelphia, it's possible, but it requires constant effort and constant communication. In the scope of this interview, for a student making decisions, getting a comprehensive view of the lifestyle outside of the operating room is important for deciding what you want to do.

## **What advice would you give to a student considering surgery?**

First, you have to be someone that doesn't mind getting up a little earlier than everyone else—that never goes away. People always say, 'Oh, you're a morning person.' And I'm like, 'No, I'm a surgeon. There's a difference. It's just what we do.' You also need to have a true passion for anatomy and be drawn to and enjoy being in the operating room and performing procedures.

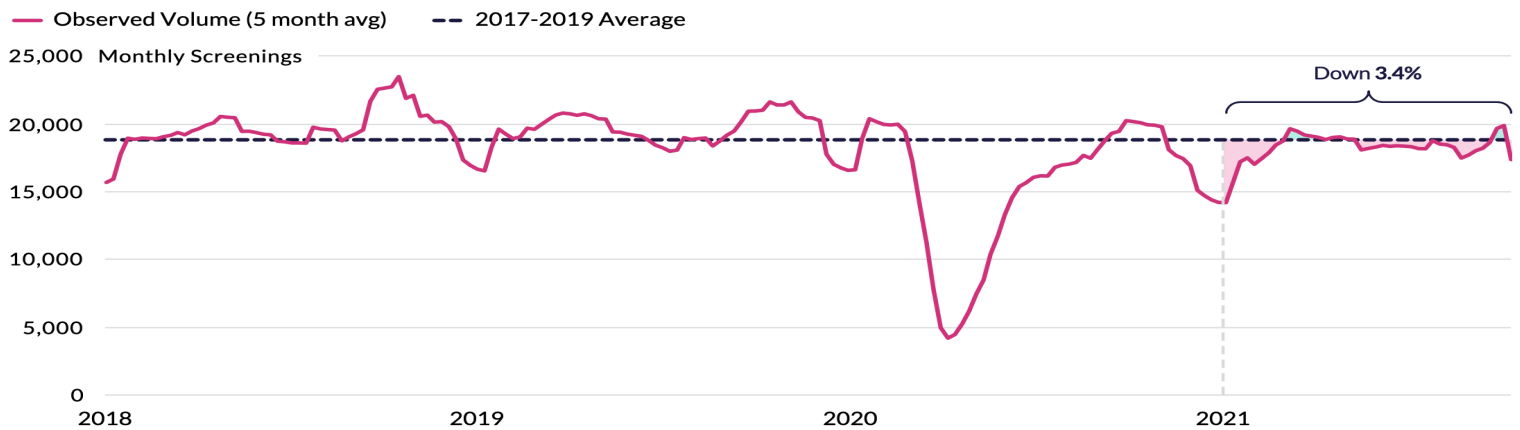
## **What advice would you have to a student who has already decided upon surgery?**

Get as much exposure to different surgical specialties as possible. They are not one-size-fits-all. Not just from a technical standpoint, but from the patients they care for to the problems they treat. Experiencing the different specialties will help you pick the best sub-specialty for your personality.



# A Surgical Perspective of the Effects of the COVID-19 Pandemic on Healthcare

By Sanath Patil, SKMC Class of 2025



**Figure 1 | Average Monthly Screenings for Colon Cancer.** Screenings have remained below the 2017-2019 average for the most part in the post COVID-19 era.<sup>12</sup>

The COVID-19 pandemic has posed significant challenges to healthcare systems. The field of surgery has been pressed with unique issues. These have included declining outpatient visits and screening rates, staffing shortages on floors and operating rooms, and changes to the types of operative cases offered. Alongside these changes, the pandemic has spurred further growth opportunities, including significant telemedicine advances.

## Outpatient visits

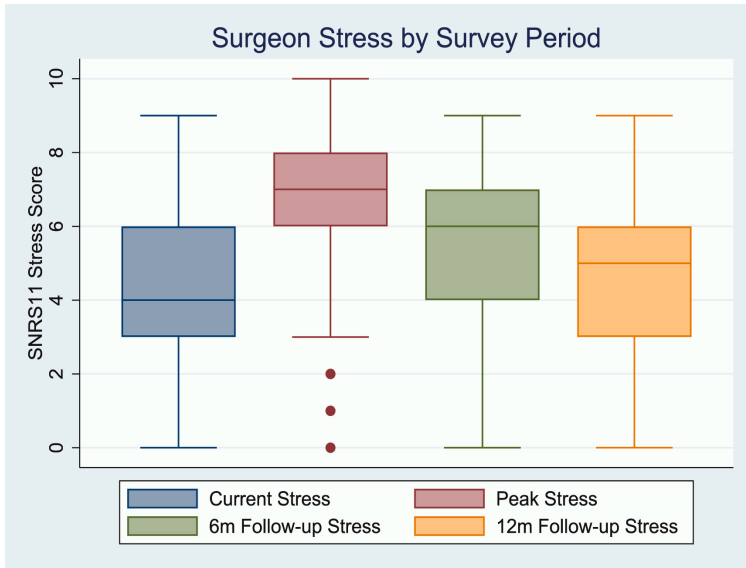
At the height of the pandemic, many hospitals reported declining operating margins from fewer outpatient visits, a relative stoppage of elective surgeries, and fewer screening opportunities.<sup>1</sup> Fewer outpatient visits was a significant factor in the changing financial landscape, with data showing that there had been a significant drop in outpatient visits with a fall of 16.5% and 3.2% from baseline pre-COVID levels in 2020 and 2021, respectively.<sup>2</sup> This led to fewer referrals to surgery from outpatient specialties than pre-COVID levels and a related drop in hospital revenue.<sup>3</sup> The reduction and subsequent delay in elective surgeries have been associated with a higher rate of reoperation, worse postoperative outcomes, and more risky surgeries being performed. The Lancet reports delaying surgery for over six months can lead to a 50% greater likelihood of worse outcomes.<sup>4</sup>

## Screenings

Breast and colon cancer screenings have decreased by 3%, and cervical cancer screenings decreased by 10% in 2021, with other disease screenings expected to have dropped as well.<sup>2</sup> Furthermore, there are substantially fewer initial cancer workups with computed tomography (CT) (decline of 20.0%) and overall cancer screens (decline of 11.7%) compared to the pre-pandemic era.<sup>5</sup> The lower screening rates for specific cancers and fewer primary workup CTs may lead to delayed diagnoses and postponed surgeries. With later diagnoses, patients are at risk of worse short- and long-term disease outcomes.

## Shortages in the operating room

The after-effects of the COVID pandemic also extend to staffing shortages in the operating room. Factors such as post-COVID sequelae, mandated quarantine times, and elevated stressors in healthcare workers causing burnout are major contributors to shortages. One study reports that among healthcare workers with post-COVID sequelae, 46% were continuing work with reduced hours.<sup>6</sup> Additionally, healthcare workers are the second most likely to report having post-COVID conditions, further indicating this has led to significant OR staff shortages.<sup>6</sup> Another cause of OR staffing shortages is burnout caused by the inherently sicker patients seen and the greater risk of COVID transmission among healthcare workers. Surgeon stressors persisting twelve months after COVID



**Figure 2 | Surgeon Stress.** Surgeon stress has persisted in the post-COVID era in both the 6-month and 12-month follow-up surveys with mean stress showing no change in significance during this period.<sup>7</sup>

include fear of progressed disease in patients from delayed diagnoses and treatments, the pressure of making more complex decisions for patients, and financial stress.<sup>7</sup> Emotional exhaustion, a proxy measure of burnout in all healthcare workers, has increased from 31.8% in the early pandemic times to 40.4% in January 2022.<sup>8</sup> The increased level of burnout has led to elevated ICU nurse attrition rates, leaving behind increased nurse-to-patient ratios and further hardships on healthcare teams.<sup>9</sup> Consequently, the high nurse-to-patient ratios have led to a further predisposition for burnout among currently employed OR nurses. A perpetual cycle of increased demands in a complex work environment followed by burnout and attrition has become increasingly seen in healthcare.

## Telemedicine expansion

Telemedicine has been one solution to post-pandemic hospital and patient hardships. The field has surged in popularity with the onset of the pandemic and has stayed constant at 38 times the pre-pandemic level.<sup>10</sup> For hospitals experiencing shortages in healthcare providers, telemedicine can continue the maintenance and expansion of collaborative care with other specialties, improving patient outcomes pre-operatively and intra-operatively.<sup>11</sup> Telemedicine also provides an opportunity to ensure outpatient visits and screenings are advised for high-risk patients. Ultimately, telemedicine has been advantageous for healthcare workers and patients by ensuring timely care is provided to patients in hospitals with shortages and allowing physicians to practice medicine remotely with a decreased risk of COVID-induced burnout.

## Final thoughts

Hospitals and the healthcare system have been challenged due to the COVID-19 pandemic. Expenses have risen along with declines in revenues and patient volumes.<sup>1,2</sup> With a rebound in patient volume accumulating, an adequate response must consider the effects of the COVID illness, the physician and nurse shortage, healthcare worker burnout, and increased pressures on hospital funds. Furthermore, persistent declines in outpatient visits and screenings for diseases such as cancer in the post-COVID era may lead to lower detection and treatment rates for all patients. Combined with the delay in elective operations and patients increasingly presenting with progressed disease, OR issues remain evident. The field of surgery has and will continue to have to adapt to a multitude of challenges.

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# An Interview With Dr. Deviney Rattigan

By Bhavana Thota, SKMC Class of 2025



*Dr. Deviney Rattigan is an Assistant Professor of Surgery in the Division of Acute Care Surgery. She attended Jefferson Medical College of Thomas Jefferson University, where she served as an officer for Gibbon Surgical Society (GSS). She completed residency at Cooper University Hospital and a trauma surgical critical care fellowship at Rutgers New Jersey Medical School.*

We discussed Dr. Rattigan's path to surgery, the transition from her training to her early career, and her goals for the future. Throughout the interview with Dr. Rattigan, it was clear that she is passionate about medical education, global surgery, and providing patients with more holistic follow-up care. She spoke about her determination to aid vulnerable populations, provide education during her international surgical missions, and improve sustainability in communities lacking access to surgical care. One of her ultimate career aspirations is to establish a long-term polytrauma follow-up clinic. Inspiring and thought-provoking, Dr. Rattigan's reflections on her surgical career thus far provide valuable insight into the transformation of a determined medical student into a skilled attending surgeon.

### **What sparked your early interest in surgery?**

I always knew I wanted to be a surgeon. Before I could remember, my parents told me I talked about it. I was one of those kids that cut things open to see what was inside – dolls and other random items. I always thought it was the coolest thing. It might have started with curiosity, but I love the idea of fixing things with my hands and being able to help people in the process.

### **What led you to pursue a fellowship in surgical critical care?**

I liked several fellowships throughout my residency training, but trauma surgery seemed to do it all, so it really appealed to me. I liked the idea of taking care of patients during times of emergency. Every day is different, and the versatility of the procedures I get to do adds an element of surprise that keeps me on my toes. All of the patients I care for have very real problems, things they need help with, and I enjoy that I can hopefully be that source of help.

### **What did you find to be the most fulfilling part of residency?**

My favorite part was transitioning from a learner to a teacher, which is the point of residency. I remember being really shocked about how little I knew when I started residency. But by the end, you are doing the surgeries, running rounds, and teaching other interns who just came in some of those clinical skills. You don't notice it when it's happening, but you can see the transformation from dependent learner to independent provider when you look back.

### **How do you feel acute surgical care has changed since you started residency?**

There's been a shift in the management of some surgical diseases. When I started residency, we were still doing exploratory laparotomies for pancreatitis and lots of splenectomies in trauma. Anyone stabbed in the abdomen was getting an exploratory or diagnostic laparotomy. But now, we realize surgery is not harmless and that not everyone needs it. More and more, part of being a surgeon is being both a surgical doctor and a medical doctor and knowing when to be which.



## **How did you get involved in global surgery, and what have your surgical mission trip experiences been like?**

I have done four surgical missions since I graduated medical school. I've found a few organizations I like, and the experience of going on these mission trips has been incredible. It's challenging to go somewhere new with facilities and conditions you are not used to working in and where people speak a different language. The biggest challenge is trying to do global surgery work responsibly and sustainably. That's also the challenging part of doing rural surgery within the country. It's all well and good to go on a trip and do a bunch of surgeries, but you have to think about what you're leaving behind too. The group I work with now is very big on education while we are there. We do Stop the Bleed courses, teach the house officers our surgical techniques, and provide equipment to use when we're no longer there. And that's the biggest takeaway I've learned about global surgery – it's really about trying to build something sustainable in a limited-resource area.

**“More and more, part of being a surgeon is being both a surgical doctor and a medical doctor and knowing when to be which.”**

## **What are some of your career aspirations?**

My dream of dreams is to spend a good chunk of time doing volunteer and mission work, but when I'm at home, I would love to be a part of a long-term polytrauma follow-up service or center. This kind of work doesn't happen in many places and is geared toward patients who suffer terrible traumatic injuries. These are people who might be in the hospital for a month or more and need rehab and physical therapy afterward. These patients may also have concomitant issues with social determinants of health. For example, they may need help with insurance, maybe their living situation isn't great, and they need social work help, or their license expired, and they need to get back to driving for proper transportation. Many of these factors go unaddressed at hospitals because, during a hospital stay, the focus is primarily on a patient's health. However, recovering from traumatic injuries can profoundly impact a patient's personal life.

Where I went to fellowship in Newark, they had what was called a Survivor Clinic. In that clinic, they would see patients every couple of weeks to months after a devastating injury. They discussed what was working and what wasn't, determined whether the patient needed referrals, and addressed the

patient's entire spectrum of needs, from pain management to childcare. My ultimate dream would be to have a clinic like this someday.

## **What was your favorite part of being a Gibbon Surgical Society officer during medical school, and how do you feel that prepared for residency/a surgical career?**

What I liked most at the time was the Pig's Feet and Pizza event [now Clinical Skills Night]. I thought it was unique and a lot of fun. Looking back now, after experiencing a couple of different medical school programs, the great part about Gibbon is that it's a way to help medical students who are starting their surgical clerkship get an understanding of what the expectations are. Not many places do that for medical students, and surgery rotations can be very demanding. For example, when I was in residency, medical students weren't told when to show up or what to do. They didn't know where the OR was or how to scrub in. While I was a resident, I tried to send weekly emails to the medical students with the time rounds were starting, our expectations, and some materials they could review. It probably would have been nice to have something like Gibbon to gather them all the week before their surgery rotation and prepare them for what to expect.

# The Importance of Mentorship in Improving the Outlook and Perception of General Surgery Among Medical Students

By Nicholas Fox, SKMC Class of 2025

Interest in general surgery has steadily decreased among medical students over recent years, with the number of US medical seniors who matched to categorical general surgery programs decreasing from 5.6% in 2014 to 3.5% in 2022.<sup>1</sup> Combining the diminishing pool of upcoming general surgery trainees with an aging population of practicing surgeons, multiple studies have predicted an upcoming shortage of general surgeons.<sup>1,2</sup> Therefore, it becomes crucial to identify the factors influencing students to pursue a career in general surgery. These factors can then be targeted by educators to attract high-quality candidates into the field of general surgery. A systematic literature review by Schmidt et al. investigated the factors during medical school and preclinical training that influenced medical students to pursue general surgery training.<sup>1</sup> A total of 38 articles from 2001 to 2015 were selected, involving multiple US institutions. The review found the most common factors influencing medical students' decision to pursue surgery included mentorship, lifestyle, stereotypes, gender, clerkship, income, fit, and timing.<sup>1</sup> The most common theme, described in 12 of the articles, was mentorship. More specifically, the students defined this as mentorship received during their surgical clerkship. This was followed secondly by student rating of clerkship experience. Lesser factors included the influence of stereotypes and misconceptions, as well as the surgeon's lifestyle.<sup>1</sup> One study from a systematic review by Lindeman et al. found that 82% of medical students polled decided to pursue surgery because of the positive mentorship they received from surgeons during their sub-internships.<sup>3</sup> An additional article from a systematic review by Cook et al. revealed that students who experienced a one-on-one surgical clerkship experience with faculty mentors showed a significantly higher level of interest in pursuing surgery than students who experi-

enced a traditional rotation without a specified mentor (63% vs. 22%).<sup>4</sup> Furthermore, a study by Whittaker et al. demonstrated surgical residents can effectively mentor medical students and positively influence students' perception of general surgery.<sup>5</sup> Taken together, these results suggest that mentorship experiences during the surgical clerkship positively influence medical student pursuit of surgery. This mentorship is effective when received from surgical residents and attending physicians alike. Given the substantial impact that positive mentorship can have on student perception of general surgery, establishing a formal mentorship program during student training is a step forward to improve interest in the field. Some programs have already taken this approach, an example of which is Brown University. The program established a structured general surgery mentorship and clinical exposure program available to second-year medical students.<sup>6</sup> This program paired interested students with surgical residents, and interventions included regularly scheduled meetings and early operating room and surgical rounds exposure.<sup>6</sup> This structured mentorship program significantly improved student confidence, exposure to surgical experiences, and the likelihood of pursuing general surgery compared to the standard clerkship experience.<sup>6</sup>

A similar program has recently been implemented within the Department of Surgery at Sidney Kimmel Medical College at Thomas Jefferson University. A Mentorship-Based Surgical Clerkship (MBSC) was created in which medical students were paired with a surgical resident during their surgical clerkship instead of rotating through multiple resident teams.<sup>7</sup> The MBSC was inspired by the finding that in the traditional format of the surgery clerkship, students often identify as observers, rather than members of the team. This is partly due to the mismatch between traditional pedagogy techniques and the millen-



**Figure 2| The Values of the Millennial Learner.** This diagram demonstrates the values of the millennial learner with mentorship at the core.<sup>5</sup>

nial learner's preferences for learning. Techniques best suited for the millennial cohort include using technology, teaching skills with context, providing regular and actionable feedback, and utilizing creative and safe learning environments.<sup>8,9</sup> With this mismatch in mind, the MBSC at Jefferson was designed around the values of the millennial learner, with mentorship at the core (**Figure 1**). The mentorship was student-led, meaning students were responsible for asking their mentors to provide direct feedback, personalized goals, and OR skills coaching.<sup>7</sup> Statistical analysis of Likert-Scale surveys from 84 students in the academic year of 2021-2022 was completed and showed that the MBSC was successful in increasing confidence in OR etiquette, participation in rounds, and suturing. There were also increases in perceived surgeon compassion, respectfulness, and teaching ability. Most importantly, more students were encouraged by a surgeon to pursue surgery and reported considering a surgery career themselves.<sup>7</sup> The findings at Jefferson are in line with prior studies showing mentorship to be a major, if not the most important, factor in a student's interest in general surgery.

Expanding and improving the mentorship available to medical students during their surgical clerkships provides a promising route for increasing interest in general surgery. Targeting clerkships as opportunities for mentorship programs allows students to form more significant relationships with teaching faculty during their clinical exposure. A limitation to this approach may include the availability of faculty and resident mentors, given their already demanding clinical schedules. While student perceptions regarding poor work-life balance and negative stereotypes may continue to impede student interest in general surgery, applying a structured mentorship program presents a

tangible approach to help correct the declining interest in general surgery among medical students.

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# Surgical Fellow Spotlight: An Interview with Dr. Steve Gurien



By Mariella Toro, SKMC Class of 2025

*Dr. Steven Gurien is a fellow in the division of Colorectal Surgery. He attended medical school at Jacobs School of Medicine and Biomedical Sciences, University of Buffalo. He completed his general surgery residency at Northshore University Hospital/Long Island Jewish Medical Center.*

## **What led you to pursue a colorectal surgery fellowship?**

I was drawn to colorectal surgery for its variety. As a colorectal surgeon, you can treat cancer, work with IBD patients, do complex open or robotic abdominal surgeries, scoping, and still have a lot of face time with patients in clinic. It is broad and still allows me to do general surgery, which I like.

## **What has the transition from residency to fellowship been like?**

It has been pretty good! I moved to Philly from Long Island after residency and have loved it, especially as a sports fan. What I was surprised to find out was the change in responsibility. As a chief resident, I thought I had a lot of responsibility, but that responsibility has increased as a fellow, and I'm sure it will be more as an attending.

## **What drew you to Jefferson's program?**

I was attracted to Jefferson's strong academic reputation, but also really got along well with everyone in my interviews. We all have a similar sense of humor and temperament.

## **What does a typical week look like for you?**

My schedule changes from week to week. Mostly, I do two days of abdominal surgeries, a day and a half of clinic, a day for scoping, and half a day of smaller anorectal cases each week. I look forward to the big abdominal surgery cases, but

it changes daily within the hospital as consults or emergency cases come in through the ED.

## **What change do you anticipate or hope to see in the colorectal surgery space?**

One significant change in colorectal surgery is treating rectal cancer without surgery. More and more of a "watch and wait" approach after total neoadjuvant therapy is used. If the tumor completely disappears, you can wait and see how the patient does. Recently, a small study showed excellent results with the complete elimination of rectal cancer with an immunomodulator. It's only for a small subset of people with a specific patient genotype. Low rectal cancers are challenging to treat, and I think more of the field will be pushing toward seeing how we can medically treat these patients instead of doing a morbid procedure on them.

## **What are specific interests you have within the field of colorectal surgery?**

I am interested in the treatment of rectal cancer. There are many treatment approaches: short and long-course radiation with different types of chemo. Ultimately, there are many options before you get them to the operating room. It is a lot more complex than I thought initially and very interesting. The surgeries are involved and sometimes can be morbid, but ultimately it gives a chance to cure a patient.

## What are your favorite types of cases?

One of my favorite cases is an Altemeier. This procedure helps patients with rectal prolapse by doing a perineal resection of a prolapse. This resection can change the quality of someone's life from prolapsing all the time to being able to go out and walk around—it's a remarkable case.

## What interests you outside of medicine?

I love traveling; I'm packing as we talk right now! Due to COVID, the past couple of years has had less traveling than I would have liked. I also love watching sports and spending time with family when I can. Oh wait, I was supposed to work Taylor Swift into the interview. My wife got tickets and is trying to make me learn all her songs before the concert. It's not going well.

## What would you tell someone trying to decide if surgery is the right field for them?

That is the big question! Here is the advice that I would give: Keep an open mind during your third-year rotations. All of the specialties have their pros and cons. I enjoyed my pediatrics rotation and would have told you that I did not like kids at the time. Try and keep an open mind, and if you think that your favorite place in the hospital is the operating room and you notice yourself getting excited every time you have a case that takes you there, that's where you should be.

## What is your favorite OR music?

I'm not allowed to play my favorite OR music, rock and metal, because everyone keeps vetoing me. So I pick alternative rock like The Lumineers or Of Monsters and Men.

## Wow, those are some pretty mellow picks for someone who prefers metal.

I know, mostly crowd-pleasers. I'm a team player.

## If you had to perform one surgery for the rest of your life which would it be?

The Altemeier! It is so much fun.

## How would you describe your teaching style?

As a teacher, I try to get people to think for themselves, which ultimately takes patience. Instead of asking a question, having someone not get it right, and then giving them the answer, I try to have them figure it out themselves. I have learned that many problems have logical solutions that you can reach by thinking step-wise. If you do that, you'll understand and retain the science and be able to apply that to future patients.

# GEN SURG 101



## What Kinds of Forceps Are Used in Abdominal surgery?

Surgeons use a variety of instruments to during surgery. Some of the most common forceps used include the **Allis forceps**, **Babcock forceps**, and **Kelly forceps**. All three are often used in laparotomies, laparoscopies, and gynecological surgeries. The Allis forceps help to hold and manipulate heavy tissue. The Babcock forceps are useful for holding and manipulating delicate or slippery tissue. The Kelly forceps are helpful for clamping blood vessels, working as hemostatic agents, as well as holding heavy tissues. Surgeons use larger instruments, such as fan and bookwalter retractors, to keep the abdominal wall open during surgery.

by Jonathan Martin SKMC '26

# Point of Care Ultrasound in General Surgery Residency

By Michael Pamonag, Drexel College of Medicine Class of 2025

## Point of Care Ultrasound—Medicine’s Swiss Army Knife

Point-of-care ultrasound (POCUS) is medicine’s version of the Swiss Army knife. POCUS describes a focused and portable ultrasonography exam performed by a non-imaging specialized clinician at the bedside or point of care.<sup>1,2</sup> In emergency medicine—the leader of POCUS incorporation and training—POCUS is used to diagnose a variety of emergent medical conditions such as appendicitis, airway blockage, abdominal aortic aneurysms, and traumatic injury.<sup>1</sup> Surgically, POCUS is an effective tool for the efficient diagnosis, staging, decision-making, and initiation of procedures that historically require radiological guidance.<sup>2</sup> In trauma surgery, the E-FAST exam provides a real-time, noninvasive, and efficient tool to identify intra-abdominal injury, hemothorax, and pneumothorax in trauma patients.<sup>3</sup> In general surgery, there is moderate evidence identifying the use of routine ultrasound in scanning the gallbladder, thyroid, parathyroid, and deep vein thromboses.<sup>4</sup> POCUS has filled in time-sensitive gaps in treatment and diagnosis that may have risen while waiting for formal radiological investigation while greatly reducing cost. Despite the widespread adoption of POCUS across specialties, there is great variability in the emphasis placed on POCUS training and proficiency across all surgical residency programs, demonstrating the need for standardization and uniformity.

## POCUS training in General Surgery Residency is available but lacks widespread implementation

The compatibility between proficiency in ultrasonography and surgery was recognized early on. At the 1998 meeting of the American College of Surgeons, the first ultrasound course was presented by the “Ultrasound Users Group” as a mixture of a didactic curriculum offering instruction on the basics of ultrasound (i.e., physics and instrumentation), disease-specific ultrasound, and skill stations to improve technique and acquisition of high-quality images and interpretation.<sup>4,5</sup> Ultrasound education rapidly evolved; by 2003, nine postgraduate ultrasound courses were offered.<sup>5</sup> Currently, the ACS offers a variety of

in-person and online courses ranging from ultrasound basics to clinical applications. Despite a developed and well-supported curriculum, the uptake and emphasis placed on formal ultrasound education are limited in many surgical residencies. One survey, offered to hundreds of accredited general surgery program directors across the United States, showed that while 96% of the residency programs offer ultrasound training under some guise, the focus was mainly limited to FAST exam-related studies.<sup>6</sup> Further, despite this widespread exposure, the competence of newly graduated surgeons and current surgical residents in ultrasound use is under scrutiny. A retrospective review of ultrasound training program records performed by Tripu et al. showed that only 20% of newly graduated general surgery residents were observed to be competent in the FAST exam, despite having 100% of the cohort receiving FAST training.<sup>7</sup> Observed competence for other critical care POCUS exams ranged from 13.3% to 0%.<sup>7</sup> Notably, self-perceived competence was greater than observed competence, suggesting that brief exposure to ultrasound in residency may provide a false sense of competency in POCUS.<sup>7</sup> Thus, while POCUS education has made strides in its incorporation within surgical residency, formal evaluation of resident skill levels highlights a demand for its standardization and formal inclusion in the residency curriculum.

## Incorporation of formal POCUS training shows excellent value for surgical residents

Across the United States, many programs have begun evaluating the impact of providing formal training to surgical residents in ultrasound. Hosseini et al. assessed the efficacy of a combined didactic and practical ultrasound training curriculum. They showed significantly improved image detection, optimization, and interpretation in various categories among junior residents.<sup>9</sup> These improvements were not observed in senior residents, suggesting the benefits of early training.<sup>9</sup> Davis et al. implemented a formal curriculum that consisted of an online thyroid ultrasound course, followed by an opportunity to practice ultrasound-guided fine needle aspiration (US-guided FNA) on a mannequin.<sup>10</sup> The 11 residents that completed a pre-and post-instructional exam showed a significant improvement in



Level system	Critical deficiencies: These learner behaviors are not within the spectrum of developing competence. Instead, they indicate substantial deficiencies in a resident's performance. Level 1: The resident is demonstrating milestones expected of an incoming resident. Level 2: The resident is advancing and demonstrates additional milestones but is not yet performing at a midresidency level. Level 3: The resident continues to advance and demonstrate additional milestones; the resident demonstrates most milestones targeted for residency in this subcompetency. Level 4: The resident has advanced so that he or she now substantially demonstrates the milestones targeted for residency. This level is designed as the graduation target. <sup>33</sup>
Practice domain	Performance of operations and procedures
Competency	Patient care 4
Critical deficiencies	This resident lacks core skills in point-of-care US, such as determining the indications for the use of US in surgical practice, demonstrating the proper use of US equipment, obtaining and interpreting adequate images included in the FAST examination, or demonstrating the proper use of US for obtaining vascular access.
Level 1	This resident has core US skills and is able to demonstrate their knowledge of the indications for the use of US in surgical practice, is able to demonstrate the appropriate use of US equipment, can obtain and interpret adequate images included in the FAST exam, and can demonstrate the proper use of US in vascular access procedures.
Level 2	This resident can incorporate core US skills into clinical surgical practice and perform basic US examinations without guidance. This resident can provide junior residents with instruction on the use of equipment, acquiring and interpreting images, and the performance of core US-guided procedures, including the FAST examination and obtaining vascular access as well as US-guided needle placement for biopsy. This resident is able to demonstrate competency in at least 1 enriched US skill set, including obtaining and interpreting images in head and neck, vascular, hepatobiliary, and/or cardiopulmonary point-of-care US examinations with or without guidance.
Level 3	This resident demonstrates advanced proficiency in the FAST examination and US-guided vascular access and needle placement and is able to impart his or her skills to others. This resident has competency in 1 or more enriched point-of-care US skills, including but not limited to head and neck, vascular, hepatobiliary, and cardiopulmonary image acquisition without guidance. This resident can also demonstrate proficiency in 1 or more advanced US guided procedures in his or her chosen area of specialization.
Level 4	This resident demonstrates advanced proficiency in the use of point-of-care US and its integration into clinical surgical practice. This resident can independently perform and interpret US examinations and US-guided procedures in all core and at least 1 enriched areas of expertise. This resident can guide others in developing proficiency in both basic and advanced US examinations as well as safely and effectively performing US-

**Table 1 | Proposed Milestones for POCUS in General Surgery.** Obtained from Beal et al. (2017).

their knowledge and proficiency of US-guided FNA.<sup>10</sup> Kotagal et al. implemented a surgeon-specific POCUS training course for 16 surgical residents, which consisted of seven 2-hour sessions, combined with didactic and proctored skill stations covering a broad range of applications.<sup>11</sup> Surgical residents showed a significant increase in self-confidence in identifying pericardial and peritoneal fluid, performing ultrasound-guided procedures, estimating ejection fraction, and performing a FAST exam after the course.<sup>11</sup> In addition, surgical residents overwhelmingly agreed that POCUS training would improve their US-based practice, make them better residents, and improve their practice when resources are limited.<sup>11</sup> Another study compared the ability of POCUS-trained surgical trainees to accurately diagnose cholecystitis against accredited radiography ultrasonography.<sup>12</sup> Surgical residents trained in POCUS had statistically similar sensitivity and specificity for the diagnosis of symptomatic cholelithiasis compared to accredited radiography ultrasonography, demonstrating the utility of POCUS training once again.<sup>12</sup>

## Final Thoughts

An overwhelming majority of residents who have received ultrasound training agree that POCUS deserves a formal place within the surgical residency curriculum. Programs incorporating formal education in their programs have seen noticeable increases in surgical resident confidence and proficiency in performing surgery-related POCUS skills in practice. While the ubiquity of POCUS is apparent, formal education and standardization of expected core competencies need to be revised across all surgical residency training. Recognizing the importance of formal POCUS-related education is imperative to developing the modern surgical trainee.

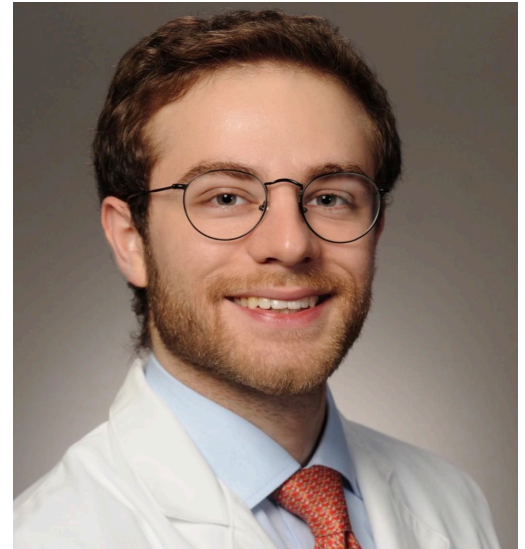
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# Surgical Resident Spotlight: An Interview with Hamza Rshaidat

Recipient of the 2022 Gibbon Teaching Award

By Kylee Shivok, SKMC Class of 2026



*Dr. Hamza Rshaidat is a third-year general surgery resident at Jefferson University Hospital. He grew up in Jordan, but he completed his schooling as a part of Jefferson's transatlantic partnership with St. George's University of London. In 2021, Dr. Rshaidat was awarded the Resident Teaching Award for his excellence in teaching academic medicine. After his general surgery residency, Dr. Rshaidat hopes to apply for a fellowship in minimally invasive surgery with a particular interest in thoracic surgery. He hopes to have an opportunity to investigate thoracic surgery topics during his research year as well.*

## **Tell me a little bit about yourself.**

I grew up in Jordan until I was 16. I then attended a program that included two preclinical years in London and two clinical years in the US at Jefferson.

## **You are currently in your third year of general surgery residency; where do your interests lie within the various surgical fields?**

I am specifically interested in a Fellowship called Minimally Invasive Surgery, which involves using robotic and laparoscopic techniques.

## **Can you describe what a typical week at the hospital looks like for you?**

This depends on the rotation, but generally, you're in the hospital by 6 AM for rounds before reporting to the OR for the day. In between cases, you'll see new patients and consults. On Thursdays, we have protected education time from 7 AM to 11 AM where we give presentations, run robotic simulations, practice technical skills, or have lectures with other departments.

## **Why academic medicine?**

Complex caseloads, many subspecialties, transfer patients from other hospitals, and research opportunities.

## **What do you think makes a good teacher?**

A good teacher is patient and has an obvious willingness to teach. As surgeons, our schedules can be very busy, but an extra five minutes in the OR to have the medical student try suturing and knot-tying can make a big difference. It's what medical students are there for.

## **What do you enjoy most about teaching medical students and interns?**

Seeing progress after teaching students and interns is very rewarding. The biggest example seen in medical students is in knot tying and suturing.

## **What advice do you have for students interested in surgery?**

Keep an open mind. Go into rotations and show interest in all of them, even if you think it's something you're not going to like. Be proactive. Learn from watching. Finally, come prepared for rotations. Watch videos about anatomy for the procedure. I still do that as a resident.

## **Do you have any mentors that have positively impacted the course of your career?**

My most influential mentor has been my dad. I love talking to him and getting his guidance and opinions on things.

## What do you believe to be the biggest misconception regarding physicians in surgery?

I think the biggest misconception is that surgeons are obnoxious or heartless. In fact, the most empathetic people I've met in the field were surgeons. Our patients are often very sick; you have to be empathetic with your job.

## What do you love about Jefferson?

It was the family feeling and camaraderie that drew me to Jefferson. The residents were willing to teach and were very friendly. They all seemed to enjoy working with each other as well. The relationships they had with the attendings also seemed great. I've seen this prove to be true as I've been a resident.

## GEN SURG 101



### Surgeons on Twitter? Social Media use in Surgery

Now that residency programs are going virtual for their interviews, Twitter has become a hub for sharing information. This social media platform became a space for surgical residency programs to connect with prospective residents, share information, and post updates about their departments. They promote their programs by showcasing research and achievements of current residents and faculty, while also posting informational videos about their residency programs.

Using Twitter allows programs to reach a broad audience and attract students to their program. On the other side of the application, Twitter is also widely used by applicants, who share their thoughts and network with fellow medical students, residents, and attendings across the world. Tweets often end with **#Medtwitter**, which groups their post with thousands of other healthcare related tweets.

The rise of social media has allowed surgical residents to easily connect with and learn from other residents and attendings, regardless of location. The rise of Twitter has enhanced communication among residents and residency programs, making it easier for both to maximize education and growth.

by **Jonathan Martin SKMC '26**



# Research Spotlight: An Interview with Hien Dang, Ph.D.

By Nolan Fox, SKMC Class of 2025



*Hien Dang, Ph.D., is an Assistant Professor and the Vice Chair for Research at the Thomas Jefferson University Department of Surgery. Dr. Dang earned her Ph.D. in Molecular Medicine from Penn State University, followed by a Postdoctoral Fellowship at the National Cancer Institute. The highlighted achievement of Dr. Dang thus far is the discovery of a novel RNA binding protein (RBP) gene signature that predicts treatment response in liver cancer patients. Dr. Dang began her lab at Jefferson in 2018, focusing on oncogenic RBPs in hepatocellular carcinoma (HCC) and pancreatic ductal adenocarcinoma (PDAC). She works closely with Jefferson surgeons and includes residents and medical students on her projects.*

## **What is your lab's mission?**

Our mission is to improve the overall survival of cancer patients, specifically patients with HCC or PDAC. The goal is to understand how cancer progresses and to develop valuable tools (diagnostic or prognostic) or therapeutic targets to improve patient outcomes. We also aim to apply what we learn to other solid tumors.

## **How does your laboratory research push the field of surgical oncology forward?**

We collect biospecimens and clinical data from cancer patients alongside surgeons and medical oncologists. Our lab incorporates next-generation sequencing and bioinformatics to characterize the genomic landscape of HCC and PDAC. By collaborating with those directly treating patients, we utilize the true tumor biology of cancer to identify drivers of the disease. This approach is complemented by other innovative tools such as CRISPR\* genome editing and RNA biology to dissect further how these drivers work and how therapies affect them. Together, this approach impacts patient care by focusing on tumor biology, underlying pathophysiology, and treatment effects. Our collaborative methodology has a bigger impact on pushing surgical oncology forward because we have shared goals with the caretakers to understand how tumors progress and the impact of current clinical care.

\*CRISPR is a molecular biology technique allowing the addi-

tion or removal of DNA portions from a cell's genome to study genes' contributions to phenotypes of interest.

## **How does collaborating with medical professionals contribute to your lab's mission?**

Our lab is built around interactions with physicians, in alignment with our goal to improve cancer patients' outcomes. This goal also includes medical students and residents. It behooves our lab to interact with them to instill the importance of basic science research for improving patient care. Collaborations between investigators and physicians are imperative in making progress for HCC and PDAC treatments, two cancer types with poor outcomes and limited therapeutic options.

## **How important is this opportunity for you to teach and influence individuals in the medical field?**

It is super important to train medical students and residents for me. It's not very different than training graduate students and postdoctoral fellows. The most important thing is teaching how to fail. Failure is 99% of research – it's how you deal with that failure and move forward that leads to progress. Also, I want to instill the importance of medical research in trainees so that when they're practicing, they'll continue to collaborate or conduct research themselves. This is a crucial mission of

mine since I view their participation as a necessary part of our progress. I further want to emphasize that research is hard but worth doing.

### **What research topic currently excites you most?**

My lab is interested in investigating biomolecular condensates: protein-RNA interactions that can drive cellular signaling cascades. We think that malignant cells can hijack this mechanism, promoting cancer growth and even resistance to treatments. We're currently working on understanding how condensates promote oncogenesis and whether we can target this mechanism for therapy. It's a dynamic process that can change over the progression of the disease: a moving target. It's totally worth the chase!

\*The role of biomolecular condensates in promoting cancer growth was recently established. Its role in how it may promote growth and therapeutic resistance in HCC and PDAC is still being investigated.

## GEN SURG 101



### Best books about surgery!

There are many great books about surgery that provide valuable insight for surgeons, residents, and all healthcare professionals. Below are some renowned and highly regarded books about surgery and healthcare.

*Borrowing Life: How Scientists, Surgeons, and a War Hero Made the First Successful Organ Transplant a Reality*  
by Shelley Fraser Mickle

*The Puzzle People: Memoirs of a Transplant Surgeon*  
by Thomas E. Starzl MD

*Life Before Death: A Spiritual Journey of Mind and Body*  
by Lawrence Meredith PhD

*Under the Knife: A History of Surgery in 28 Remarkable Operations*  
by Arnold van de Laar

*The Beat of Life: A Surgeon Reveals the Secrets of the Heart*  
by Reinhard Friedl MD

*Complications: A Surgeon's Notes on An Imperfect Science*  
by Atul Gawande MD

*Better: A Surgeon's Notes on Performance*  
by Atul Gawande MD

*How To Save A Surgeon: Stories of Impossible Healing*  
by Thomas Blee MD

*The Man Who Touched His Own Heart: True Tales of Science, Surgery, and Mystery*  
by Rob Dunn

*A Surgeon's Journey*  
by Jeffrey Wiseman MD

by Jonathan Martin SKMC '26

# Where Are All the Minorities in Surgery?

By Obehioye Isesele, SKMC Class of 2025

The Association of American Medical Colleges (AAMC) article “Where are all the women in surgery?” sparked a meaningful conversation regarding the discouragement women face in surgery.<sup>1</sup> This important article highlighted how potentially unwelcoming the surgical field could be. In the field of surgery, racial minorities have felt the “cold shoulder.” African Americans represent only 5.8% of surgical residents in training despite making up 13.6% of the United States population.<sup>2,3</sup> Likewise, Latinx individuals are 18.9% of the current US population and are projected to comprise 29% of the population of the United States in 2050.<sup>2,4</sup> However, only 10.4% of the surgeons in training identify as Latino or Latina.<sup>3</sup> With the census predicting that the US will become a “minority white” nation by 2045 and research showing that minority patients have better health outcomes when their physician is the same race as them, it is imperative now more than ever to diversify the field of surgery.<sup>5,6</sup> Recognizing the historical relationship minorities have with medicine and how Diversity Equity Initiatives (DEI) can aid in supporting aspiring minority surgeons can help increase diversity in surgery.

## Racism in Surgery: The Past and Present

Imagine living in Virginia in the 1830s, afraid to bury your loved one because a medical student would dig up their body and illegally use it as a cadaver.<sup>7</sup> This reality of African Americans in the United States and other horrendous acts, such as the J. Marion Sims experiments<sup>8</sup>, the Puerto Rican birth control experiments<sup>9</sup>, and the Tuskegee syphilis experiments<sup>10</sup>, sparked distrust between medicine and minority communities. Medicine has historically seen people of color as experimental subjects, not future physicians. For centuries, the bodies of marginalized people were stripped of humanity in the name of medical advancement. Yet, these same populations were not compensated or allowed to enroll in medical school.<sup>11</sup> Today, medical institutions are raving with excitement regarding the 2021-2022 increase in minority students’ enrollment in medical school.<sup>12</sup> Unfortunately, surgical fields are at risk of not capturing this wave of minority student enrollment. According to Hill et al., minority medical students were significantly more likely to receive racial/ethnic discrimination, including discriminatory comments, public humiliation, and inappropriate sexual advances than their white counterparts.<sup>13</sup>

This distress in the first four years of medical education makes another five years of surgical training less appealing to students who have faced bigoted comments from faculty, classmates, and even the patients they serve.<sup>13</sup> It was previously reported that 30% of surgical residents experience physical or mental abuse during training.<sup>14</sup> With surgery having a reputation for being intense, minority students face the dilemma of choosing to prolong the years of distress they face by pursuing surgery or choosing a residency program that is shorter in duration. This is an unfortunate reality because America and the surgical field, in general, desperately need minority surgeons. Research shows that underrepresented students benefit their medical school classes by being more likely to serve in underserved communities, having better compassion for future patients from their own community, and providing their unique experiences, all enhancing the learning environment.<sup>15</sup> With a surgeon shortage predicted to occur in 2034, now more than ever, the field of surgery needs surgeons who will serve their community and reverse the trend of negative health outcomes in minority communities.<sup>16</sup>

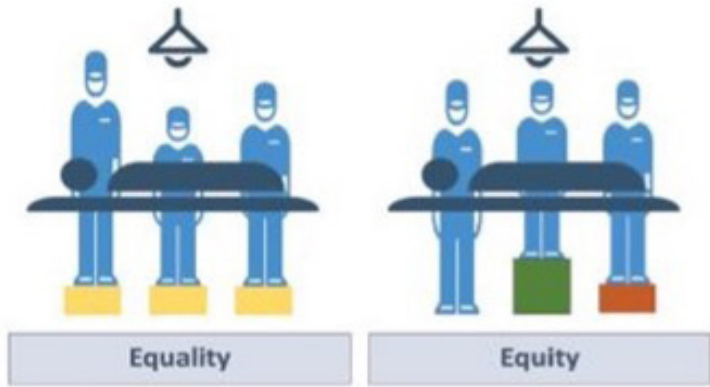
## A Diversity Statement Is Not Enough

“Well done is better than well said” – Benjamin Franklin<sup>17</sup>

Diversity, Equity, and Inclusion (DEI) has become a buzzword and has graced the websites of many surgical residency programs. However, without action, these programs fail to reach their goals. A successful DEI initiative is led by experts in the field who have a plan.<sup>18</sup> DEI efforts without evidence-based planning for equity or reinforcement do not produce a diverse field of surgeons – they just push empty promises and minority surgeon attrition.<sup>19</sup> Recognizing equity is acknowledging that all surgeons are not the same “height” (Figure 1).<sup>20</sup> The discrimination and harassment that minority students face in medical school and the lack of mentors of color in surgery make minority students “shorter” and unable to have an optimal view of the surgical field.

Conboy and Kelly outlined that mentorship is more effective than other initiatives aimed at increasing workforce diversity.<sup>20</sup> Elevation of minority students is achieved by role models and representation at higher positions. In 2020, only 8% of chairs



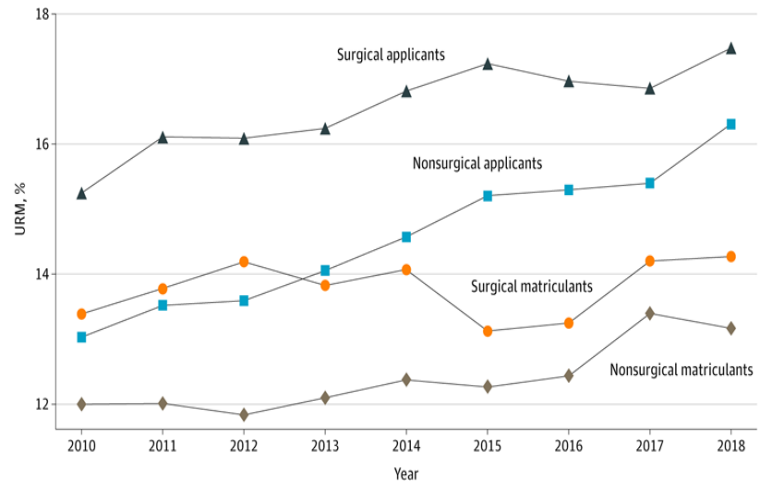


**Figure 1 | Equality vs Equity.** Courtesy of the American College of Surgeons.<sup>23</sup>

of surgery identified as African American or Hispanic, with Dr. KMarie King becoming the first African American woman to be the chair of surgery at an academic health science center in 2021.<sup>21,22</sup> Dr. Freischlag, President-Elect of the American College of Surgeons (ACS), noted that the moment that changed the role of women in academic surgery occurred when The Ohio State University appointed Dr. Jonasson to serve as the first woman chair of surgery.<sup>23</sup> She notes that Dr. Jonasson's historic appointment gave women across the field of surgery the hope that they could one day become chief of surgery.<sup>23</sup> Dr. King's appointment gives women of color hope that they, too, could be a chief of surgery. With the new appointment comes the need for support from academic surgical institutions to grow programs that provide opportunities for minority medical students and residents to advance in the field of surgery. Programs such as the Society of Black Academic Surgeons and the Latino Surgical Society's main mission is to cultivate future minority surgeons to ensure they achieve their goals. While there are obstacles hindering diversity in the field of surgery, supporting the voices of those dedicated to diversity, equity, and inclusion can propel the surgical field to reflect and help the patients they serve.

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**Figure 2 | Applicants and Matriculants to US Surgical and Nonsurgical Specialties Who Identified as Underrepresented in Medicine (URM) Based on Race/Ethnicity, 2010-2018.** This graph demonstrates that despite the percentage of URM surgical applicants increasing, rate of matriculation has remained flat. Courtesy of JAMA surgery.<sup>24</sup>

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# The Gibbon Surgical Society

The John H. Gibbon, Jr. Surgical Society (GSS) at Sidney Kimmel Medical College (SKMC) at Thomas Jefferson University is a unique student interest group that has been working hard to increase interest in the field of surgery among medical students for the last 38 years. The society has over 400 total active members on a year-to-year basis, spread across the four-year curriculum. The GSS increases exposure and interest in the surgical field through a unique blend of episodic and longitudinal programming that helps bring students, residents, and faculty together in an educational setting.

Early exposure is the crux of the GSS approach to bolstering medical student interest. Over the years, the GSS has run programs specifically targeted at students in the pre-clinical curriculum to increase surgical exposure, including overnight shifts on the trauma service, call with the organ procurement team, and SCALPELS, a longitudinal surgical curriculum that runs concurrently with the pre-clinical curriculum.

There are also events that are available to all students. The GSS runs a journal club, which is led by a surgeon at Jefferson in the field that is currently being studied by second-year medical students. Many surgeons take this time to not only educate the students in critical review of the findings of papers, but also the underlying statistics that were used. The Philadelphia Surgical Symposium is the Gibbon's signature event each year. Students from all medical schools in the Philadelphia region are invited, and it is intended to be an informative opportunity for medical students interested in surgery. There is an associated regional medical student research poster session and competition during the event, complemented by presentations from a faculty member from each school, ranging in topics from clinical experiences, to advocating for a particular field of surgery, to hot topics in research.

While the COVID-19 pandemic has changed the landscape of medical education, the GSS has worked tirelessly to create new and exciting programs to keep students engaged. Between moving some previously established programming to a virtual format to starting fresh and innovative experiences, including podcasts and virtual anatomy sessions, the GSS board has ensured a robust experience for all students wanting to become more involved with the surgery department at Jefferson.

The GSS was presented at the AAMC's Learn, Serve, Lead 2017 conference as a model for an effective medical student interest group. This journal, the GSR, is written, compiled, and curated by SKMC students through the invaluable help and planning of the GSS members, and stands not only as a testament to the involvement and hard work of the GSS, but also of the student body as a whole.

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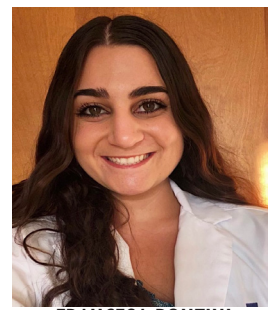
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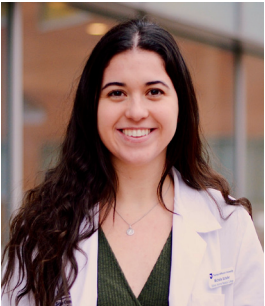
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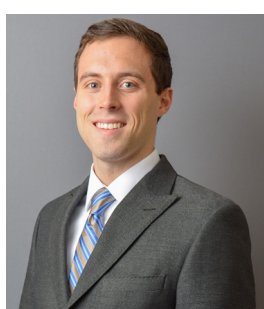
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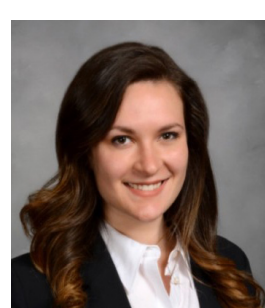
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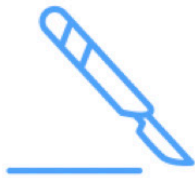
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