08
Interview With Thomas Jefferson Cardiothoracic Surgeon, H. Todd Massey, MD

Dr. Massey speaks with a first year medical student about what drew him to surgery and the state of mechanical devices in cardiac surgery today.

16
Interview with William B. Hughes, MD, Director of the Thomas Jefferson University Hospital Burn Center

Dr. Hughes talks about the recently instituted Jefferson Burn Center, what it’s like to take care of burn patients, and where he hopes burn care education goes in the future.
Women in Surgery: An Interview with Dr. Karen Chojnacki, Vice Chair of Surgical Education at TJUH

Dr. Chojnacki is the Surgical Residency Director at Jefferson and is the keynote speaker at this year's Philadelphia Surgery Symposium. She speaks with a first year medical student about becoming a surgeon and what roadblocks face female medical students on their path to surgery.

Table of Contents

04 The Gibbon Surgical Externship: A Student’s Perspective

06 Invited Article: The PCOM Wisely Surgical Association and the Philadelphia Surgery Conference

08 Interview With Thomas Jefferson Cardiothoracic Surgeon, H. Todd Massey, MD

12 The Life of a Rwandan Surgical Resident

14 Role Of Technological Advancement In The Context Of Surgical Planning And Execution: Perspective Of Jefferson Surgical Faculty

16 Interview with William B. Hughes, MD, Director of the Thomas Jefferson University Hospital Burn Center

19 Women in Surgery: An Interview with Dr. Karen Chojnacki, Vice Chair of Surgical Education at TJUH

22 Gibbon Surgical Society: History and Future Goals

24 The Surgical Society’s Namesake: John H. Gibbon Jr., MD

25 Samuel D. Gross Professor of Surgery: Charles J. Yeo, MD, FACS

26 Contributors
THE GIBBON SURGICAL EXTERNSHIP: 
A STUDENT’S PERSPECTIVE

By: Emily Sagalow, Class of 2021
Sidney Kimmel Medical College

The Gibbon Surgical Externship is a 2-week intensive program for first-year students interested in pursuing a career in surgery. Students are placed on one or two surgical services, and function as a third-year student on a surgical rotation. Students scrub into surgeries, round on patients, and participate in didactic sessions. Students are encouraged to engage with their residents and patients and are responsible for presenting a case at the end of the program. This is an excellent opportunity for students to gain hands-on, early exposure to the surgical field. Previously, the externship was held in the summer between the first and second year; the program is now run during the winter holiday break in the first year. Interested students can apply for the externship through the Gibbon Surgical Society in the fall of their first year.

Succeeding academically in medical school is very overwhelming in itself, yet one of the most difficult decisions is choosing how to spend your last summer free of class and exams between your first and second year. While this decision is a delicate balance between having fun and being productive towards your future, Jefferson specialty interest groups offer many programs that run over the summer, ranging from volunteering to research to shadowing experiences. One that particularly stood out to me, as I’m sure it did for many other students who are interested in the surgical field, was the Gibbon Surgical Externship.

The Gibbon Surgical Externship is a two-week program for rising MS2 students who are interested in surgery to gain first-hand experience learning what it means to be a surgeon by spending time with various surgical teams at Jefferson. No previous surgical experience is necessary to enroll in the program. From the 2018 application cohort, 22 students were chosen to participate in June-July. Participants are provided details of the services including names of the attendings, OR days, clinic days, and types of procedures performed, and are asked to rank which teams they wish to work with during the two weeks. A lottery system matches each student with one service per week. In addition to joining your designated surgical teams throughout the day, whether it be in the clinic or the OR, the program offers talks from Jefferson surgeons about what it truly means to be a surgeon. Sessions are also offered on placing Foley catheters, suturing, and nasogastric tube insertion. At the end of the two weeks, each student presents on a topic they learned about during their time in the program. From the 2018 cohort, presentation topics ranged from case reports to surgical techniques.

As for my experience, I was placed on the Samuel D. Gross and Transplant services. During my first week, I was able to scrub in on surgeries including a liver resection for hepatocellular carcinoma. Even just being in the OR with the talented surgeons on this service was an honor and a great learning experience; I had scrubbed into cases before, but never for procedures that were this long and skill-intensive.

While on the Transplant service, I was lucky enough to take part in an organ procurement. Dr. Ashesh Shah, Dr. Peter Altshuler, and I travelled to UPMC Pinnacle Health in Harrisburg, PA to harvest a donor’s liver and kidneys for a Jefferson patient on the transplant list. Through this experience, I learned about Gift of Life and their role in matching donors with recipients in the area.

At the end of the two weeks, I presented on the procurement case I took part in, highlighted surgical techniques used to harvest a liver and kidneys from a donor, and described the Gift of Life protocol for organ donation. This externship proved to have great individual learning experiences, but also provided many opportunities for the cohort to learn together, which reminds us all that medicine is a team sport. Not only did I do extensive research into my own presentation topic, but I learned so much from each of my classmates and their experiences on the other surgical services that I was unable to directly experience. The externship allowed us all to gain a comprehensive view of the scope and depth that general surgery encompasses.

Would I participate in this program again? Absolutely. Would I recommend this externship to MS1’s considering the surgical field? Definitely. Although surgery is not for everyone, in my opinion, there is something so unique and fascinating about the OR. Witnessing the procurement in Harrisburg, I was in awe at the surgical techniques, the fact that we are able to transplant organs between humans, and at the intricacies and beauty of the human body. To me, it is an amazing feat to be able to medically treat a patient, but it is a whole different level of treatment to be able to physically fix what is internally wrong through surgery.

This program was not only beneficial for OR exposure, but every single attending and resident that I interacted with genuinely cared about my medical education and what I thought about the surgical field. While on the Gross Service, Dr. Lavu
took my peers and me aside to discuss our idea of what it means to be a surgeon and his perspective on being a surgeon. Never did I think that I could have that type of conversation with an attending as a lower-year medical student. When the day was a little bit slower and there were no more OR cases, the residents made sure that we were occupied and even set up a mini suturing workshop for us to keep perfecting our skills, which will be very beneficial during our third-year rotations.

I was interested in surgery prior to the externship and am even more so after participating. One of my favorite memories from this experience was hearing one of the residents speak about why he chose surgery. He described general surgery as an efficient combination of medicine plus OR time. You manage your patients medically once they are on your service, but you also get to operate - the best of both worlds. As for my classmates, many of them had never scrubbed into a case or even been in an OR before, so this externship proved particularly exciting for them to experience it all for the first time. In the end, this externship proved to be beneficial in many ways - learning about what it means to be a surgeon, navigating the hospital, meeting attendings and residents, learning how to suture and scrub into OR cases - and should be considered by any medical student who thinks that surgery could be their chosen field of medicine.

The Gibbon Surgical Society held a Women in Surgery panel led by Gibbon member and future TJUH resident, Micaela Collins.

The first years in the Gibbon Surgical Society complete team-based learning exercises pertaining to acute care surgery.
THE PCOM WISELY SURGICAL ASSOCIATION AND THE PHILADELPHIA SURGERY CONFERENCE

Philadelphia College of Osteopathic Medicine

The Wisely Surgical Association (WSA) is one of the oldest and largest student groups at the Philadelphia College of Osteopathic Medicine. Approximately 270 active first-through fourth-year student members make up the organization, including medical, physician assistant, and biomedical science students. Hosting surgeon speakers and workshop events intent on fostering interest in the surgical field and building skills relevant to surgery are the main objectives of WSA. The organization covers a variety of surgical specialties, including general surgery, plastic surgery and neurosurgery, and collaborates with other PCOM clubs who represent the many other surgical disciplines.

One of the more engaging events run by the Wisely Surgical Association for the past several years has been the Philadelphia Surgery Conference, a day-long, workshop-based clinic for students interested in pursuing a career in surgery. This conference allows attending students the opportunity to build clinical surgical skills and interact with residents and physicians to learn more about their specific surgical specialty of interest. Established in 2014 by PCOM alumnus and current Penn Plastic Surgery resident, Michael Tecce, DO, this event has matured each year since its inception and has since become one of the largest student-run academic events in the country.

The 2019 Philadelphia Surgery Conference held this past January registered 217 students from ten different osteopathic and allopathic medical schools including PCOM, PCOM-Georgia, Perelman School of Medicine at the University of Pennsylvania, Drexel University College of Medicine, Lewis Katz School of Medicine, Rowan University School of Osteopathic Medicine, Cooper Medical School of Rowan University, Geisinger Commonwealth School of Medicine, Lake Erie College of Osteopathic Medicine, and Touro College of Osteopathic Medicine. Students chose from a list of twenty-two workshops that covered the surgical disciplines of OR gowning, gloving and scrubbing, suturing, casting and splinting, ultrasound-based FAST and FATE exams, peripheral/central line placement, and procedures in the specialties of orthopedics, bariatric surgery, otolaryngology, urology, cardiothoracic surgery, obstetrics and gynecology, general surgery, trauma surgery, and neurosurgery. Additionally, all students were certified by the Stop the Bleed course, a national bleeding control initiative inspired by the 2012 tragedy that occurred at Sandy Hook Elementary. Students also heard from osteopathic and allopathic surgeons, ranging from first year residents to program directors, in each of the aforementioned specialties during the surgeon speaker breakout session. Introductions to the day’s events began with a keynote address on the topic of “leadership” given by current Medical Director of Trauma and Critical Care at Hahnemann University Hospital and PCOM alumnus, Marcin Jankowski, DO. The conference day concluded with a personal perspective that highlighted initiative and selfless service practiced in the international communities of Iraq and Nepal by Children’s Hospital of Philadelphia pediatric orthopedic surgeon and global surgery specialist, David Spiegel, MD.

This year’s conference was designed by the WSA executive board with four intentions.

Broaden interest in surgical career opportunities

The expectation was that students who signed up to attend the 2019 Philadelphia Surgery Conference already had a basic interest in surgery. However, as first- and second-year students, many previously had limited chances to explore the vast majority of surgical disciplines. With the exception of the occasional lectures that may have been dispersed throughout a first- and second-year medical school curriculum, or the relatively infrequent opportunities to shadow, exposure to the
various surgical specialties is not as apparently available until we begin clinical rotations – and in today’s medical education system, especially in the world of surgery, the somewhat unfortunate expectation is that students have already begun conducting research, set up electives, or in some other way shown an investment in the surgical specialty in which they are interested. This event attempts to help students prepare for these expectations by discovering their surgical interests earlier in their medical education. The intention is for students to leave the conference having learned about, and perhaps developed an interest in, a surgical specialty that they had not considered pursuing before attending this conference.

Begin cultivating clinical and surgical skills

The most valuable aspect of this event is its ability to engage each student in attendance. In designing this event, the executive board paid special attention to maintaining a small-group learning environment. Each workshop was capped during the registration period to ensure that the number of students participating in a cadaver-based procedure, electronic/robotic simulation, or technical skill-building clinic was maximally “hands-on”. The real benefit of an event like this comes from the ability of the student to say that they have not only seen a surgical skill performed before, but that they have actually performed that skill themselves. Preparations for surgical rotations and comfort level in a surgical setting were strategic considerations when designing each workshop. Many workshops offered skills training that would also be useful during non-surgical rotations, such as suturing, sterile technique, and team-based patient care. The intention here is that students who participate in the Philadelphia Surgery Conference leave with not just a broadened interest in surgery, but an increased sense of confidence in their own personal technical skills as well.

Interact with residents and attending physicians

The size restrictions of each workshop served the additional purpose of establishing a more personal setting between the students and the surgeons facilitating each workshop. The small group sizes were intended to encourage students to ask questions and receive feedback in a low-stress academic setting. Many of our workshop facilitators are surgeons in the surrounding Philadelphia area, so it is not unreasonable to think that students will see these very same individuals again later on in their medical training.

Collaborate with our medical counterparts

With the evolution of the delivery of medical care, there has been increasing stress on the importance of interprofessional communication and cooperation between healthcare providers. As future physicians, we are obligated to be able work effectively in teams to provide the best care for our future patients. By no means is this a novel concept, but recent initiatives such as the implementation of interprofessional education into medical school curriculums and the shift in graduate medical education toward a single accreditation system have re-endorsed this theme. This conference intentionally invites both osteopathic and allopathic medical students and physician assistant students from a wide range of institutions to put into early practice this collaborative effort to build competent, well-rounded surgical team players.

Preliminary review of the course evaluations has been overwhelmingly positive, and suggestions for next year’s Philadelphia Surgery Conference are already being considered. The Wisely Surgical Association looks forward to continuing to offer this unique pre-rotation surgical skills course to all interested allopathic and osteopathic medical students for years to come. More information about the workshops and recruited surgeon volunteers can be found on the 2019 conference website at http://thephiladelphiasurgeryconference.com.
Q: What drew you to surgery as a specialty?
A: When you are in medical school, and also later on in your training, your total focus is on the clinical aspects of individual patient care at a specific time point. You are treating a single patient in their episode and this is what you do for them. It really must be much bigger and broader than treating one patient at a particular time point in their disease process in order to be effective. It’s about population health management and focusing on developing integrated systems utilizing evidenced-based methods and data analytics to effectively treat each individual patient appropriately across a disease continuum, rather than just treating one patient episodically. In order to effect change and be efficient in the care you deliver, you have to be acting on that level. I don’t think I had that sort of understanding of medicine when I first started.

Q: What brought you here to Thomas Jefferson University?
A: A lot of my decision to come to TJUH had to do with the direction of the institution as a whole. I truly believe that the leadership here is interested in changing the way that we deliver healthcare in America and in bending the healthcare curve. The therapies that I offer are at the bottom of a big funnel, as they are applicable to a highly select heart failure population. Heart failure continues to be a big problem in this country and worldwide in terms of morbidity, mortality, and financial burden. To truly be effective, the TJUH Advanced Heart Failure Group focuses on this larger group of heart failure patients in an attempt to change their trajectory, in hopes they will never need the services I offer. It is more than just implanting a ventricular going into it?
A: I went into medicine with an open mind; I didn’t go into medical school saying “I’m going to be a surgeon”. I didn’t come from a background of physicians, or anything like that, so I didn’t really know what medicine entailed, or even all the different disciplines. When I was going through medical school, especially on the clerkships, that was when I first decided to pursue surgery as a specialty, mostly because surgeons seemed to be a pretty actionable group of people. I identified with that, so I figured that surgery would be right for me. I trained during the era that required general surgery training and general surgery boarding prior to undertaking training in cardiothoracic surgery. In my general surgery training I did a rotation in cardiac surgery, and I loved it. I like the physiology of it, and the fact that you could take some very sick people and make them well.

When I got into cardiac surgery, however, it was a time that we didn’t really have solutions for patients with heart failure. The current standard treatment for end-stage heart failure, heart transplant, was available at the time but limited in scope. So, at the time, heart failure patients suffered tremendously, and we didn’t have many solutions for them. Mechanical support devices weren’t very good, and the durability was terrible along with high adverse event rates. However, mechanical circulatory support to me seemed to have promise, and I got drawn to specifically helping that group of people with end-stage heart failure and trying to come up with surgical solutions for them.

Q: Is there anything about surgery that you did not expect going into it?
A: I didn’t really know what medicine entailed, or even all the different disciplines. When I was going through medical school, especially on the clerkships, that was when I first decided to pursue surgery as a specialty, mostly because surgeons seemed to be a pretty actionable group of people. I identified with that, so I figured that surgery would be right for me. I trained during the era that required general surgery training and general surgery boarding prior to undertaking training in cardiothoracic surgery. In my general surgery training I did a rotation in cardiac surgery, and I loved it. I like the physiology of it, and the fact that you could take some very sick people and make them well.

Q: Is there anything about surgery that you did not expect going into it?
assist device (VAD) or doing at transplant. I think here, with this administration, that ultimately may be feasible; we might actually bend the curve of heart failure. I’m very interested in system-wide approaches, using evidence-based medicine and clinical integration leveraging newer technologies, data analytics, and information systems to comprehensively deliver more efficient, effective, and compassionate care to people, and I think Jefferson embraces that.

Q: Can you talk about work life balance as a surgeon? How did this balance change throughout your career, specifically during your time as a medical student, resident, and a fellow?

A: It got worse [laughs]. I remember being in medical school and everyone told us you could see the light at the end of the tunnel...later on I figured out that it was a train coming toward you! [laughs] Even though I got busier as my career went on, from being in medical school to being a resident then an attending, I think that finding a good work-life balance is really important, especially with the high rates of burnout in medicine. I think ultimately individuals need to be able to maintain the right balance, and I think over time more awareness and additional guidance is becoming available for us as professionals. Especially in cardiac surgery, in this specialty, I think there’s a big focus on finding balance, and instilling that into people as they train. Certainly, training has changed. I’ve always been involved in training the next generation of cardiac surgeons, and over the years it’s changed substantially. Now there are residency work hour limits, and those restrictions are universal across the country. I think this is a good advancement. Having the proper work-life balance makes us better physicians for sure.

Q: You participated in some of the initial large clinical trials testing longer-term use of continuous-flow LVADs. More recently, you have been involved with case reports and meta analyses regarding LVADs. What drew you to mechanical circulation, and how did you get involved?

A: When I was first training, a patient with end-stage heart failure had few treatment options. There was heart transplant, but it was reserved for a highly select group that made it to the transplant list. Heart transplant since its inception has always been limited by the number of donors. At the end of the year, maybe you transplanted half the list, and the rest of your list dies. I thought this was a problem that perhaps I could have an impact on. Mechanical support devices were really developed in the 1960s and were first utilized as a bridge to recovery by Dr. Michael DeBakey in Houston, Texas. Heart transplant was...
also being investigated heavily during this time period in the 1960s, and there were a number of heart transplants done at this time, but the results were terrible. Average survival was only about two weeks. Heart transplant kind of went away after that due to the dismal results related to acute rejection, and with that, LVAD technology also went away. It wasn’t until about the 1990’s that you saw LVAD being reintroduced, and a lot of it was built on the back of heart transplant resurging due to improved outcomes with the development and adoption of cyclosporine as part of the immunosuppressant regimen for heart transplant patients. At the time I got involved with the mechanical circulatory support technology, the technology we were utilizing was not very good. It carried a significant and prohibitive risk of devastating adverse events, including stroke rates of 30-40%, and the machines themselves were large systems with limited durability. The initial systems were only meant to “bridge” individuals to heart transplantation, and these patients were required to remain in the hospital tethered to large consoles. You could put a patient through an extensive operation, and at most get an extra year of life. Nonetheless, mechanical circulatory support still had promise as a potential solution for this population given that, theoretically, it was an unlimited resource that was readily available - a “heart on a shelf”- so that’s why I got interested in it.

Q: What other areas of cardiac surgery interested you, prior to becoming more involved in mechanical circulation?

A: Heart transplantation is still the gold standard for long-term replacement of a failed native heart. It’s a biologic replacement and, even as good as LVADs have gotten, if I have a heart in one hand and an LVAD in the other, the majority of people, including heart failure specialists, would still want the heart. This might change as LVADs develop further. LVAD technology has come a long way, but even with all the advances there is still the need for a transcutaneous cable to deliver energy to power the system. The predominate reason people don’t want them is because of these cables coming out of your body. At the end of the day, there aren’t enough donor hearts for transplants, and we have to do things on that front. There have recently been some new developments in the field of cardiac preservation and resuscitation. Ex vivo organ perfusion may allow us to resuscitate marginal hearts that would not normally be acceptable, and it holds the potential for us to explore donation after cardiac death (DCD). In liver transplant, lung transplant, and kidney transplant you can currently utilize DCD organs, but historically in heart transplantation the results have been significantly inferior to traditional brain dead cardiac transplants due to the deleterious effects of ischemia and reperfusion. When utilizing DCD hearts, the results have not been good, because you need to wait for the heart to stop beating after the donor is off cardiopulmonary support before you can procure the organ. For cardiac transplant surgeons, this period of decreased blood flow to the heart is usually of a duration where the heart is damaged and will not immediately function once perfused in the recipient. With these newer ex vivo heart perfusion systems we can potentially take those hearts, resuscitate them, and most importantly, prospectively identify which hearts will work and which ones will not. The original work in heart transplantation in the 1960s preceded brain death criteria in the United States, necessitating that the first heart transplants were actually DCD hearts. With ex vivo perfusion systems, we can improve the outcomes of this approach and potentially increase the number of hearts available. I think this will also lead to more equitable distribution. The ischemic limit of a heart is about 4 to 6 hours, and that includes the time it takes procure it, bring it back, and having the surgical team sew it in. You are really limited in the distance you can go, but if you have a system for extended preservation, you could go to California and get a heart - one that maybe wasn’t going to be utilized due to geographic disparity in heart utilization. Believe it or not, we are still transporting transplant hearts the same way that we did in the 1960s, which is basically putting it in an Igloo cooler on ice. Maybe there is some room for innovation in the way we transport and reperfuse donor hearts. Another area in relation to heart transplantation I’m interested in and fascinated by is the potential for xenotransplantation, which is taking animal organs and putting them into humans. Historically this has already been done in the case of Baby Fae. I haven’t done any direct work in this, but given the robust research in genetic engineering and targeted immune therapy, this might be a possibility in the future, and I don’t think this is that far-fetched. CRISPR is a game changer for xenotransplant, and there are some companies that have gotten well-funded and are bringing this technology to the field of transplant. I think the immune hurdles are being addressed more quickly and efficiently. Norman Shumway, the father of cardiac transplant, said facetiously that “xenotransplantation is the future of heart transplantation, and it always will be”. Perhaps in the near future this will no longer be the case.

Q: How has research played a role in your career?

A: I continued with research throughout my career, initially bench research and later clinical research. For me, it opened up so many doors into understanding the things that we were doing, and I didn’t foresee how big of a part it would play in my career at the time. The first job I got after I finished my training was to start a de novo heart transplant program, and I learned a huge amount from that undertaking. Due to the innovation going on within the field of heart failure surgery, it offered abundant questions and really enabled me to continue with research interests. I continued on with the research aspect of cardiac surgery throughout my career, and to me it’s one of the most rewarding things in my practice that I’ve done. I stayed in academics for...
two reasons. First, I wanted to train the future generation of heart surgeons and this brings a lot of value to me. It’s really rewarding to see the next generation grow and get better at the field. Second, I enjoy being able to take part in new things and the developments at the forefront of the field, and I think that’s also really exciting and rewarding for me. Back when I was training, most physicians would split their time half and half between research and clinical. Nowadays, I think it’s a lot more challenging. NIH funding is harder to secure and clinical endeavors are taking more and more time. That said, it’s still doable, and the thing that I’ve found most valuable is partnerships. I was fortunate at Rochester to partner with a number of full time PhD researchers whose research was in heart failure. We were able to collaborate bringing the bench to the bedside, and vice versa. One of our focuses involved identifying novel targets utilizing gene microarray analysis of human heart tissues. We were able to investigate this through the utilization of heart muscle acquired during the implantation of mechanical support devices. Industry partnerships are also really important. Back when I first started, industry partnership was not looked at as the “thing to do”, but now it’s very common. We partner both in clinical research and basic research with many industry sponsors that bring a significant value to the academic endeavor. The point is, there are ways to balance clinical time and research, even today. It is extremely difficult to be a full-time clinical surgeon and full-time NIH R1 funded researcher, but you can still participate in cutting edge research through partnerships.

**Q: Do you have any advice for students going into surgery?**

A: When you are going to medical school, identify a mentor who can help shepherd you through everything involved in pursuing a certain surgical career pathway, and help you with insight into the field you are considering. Continue this mentorship model throughout your residency training to more fully understand your chosen field, as well as to best prepare you to achieve your goals.

**Q: What advice would you have specifically for students that are interested in an academic surgical career?**

A: Ultimately, you want to get involved with some academic research in medical school with someone who is doing things in an area you are interested in. Most people I know are very happy to take on medical students, and it’s beneficial and rewarding to them as well. As you go through medical school, make sure you identify what you are interested in early on so that you can shadow someone within the field and establish a relationship with some of the surgeons who are doing things that you care about. It may turn out that once you actually get firsthand exposure to a certain field you will decide, “that’s not for me”, and that’s ok. Wherever you end up at, the knowledge gained in the analysis and methodologies utilized in producing a manuscript in cardiac surgery will always be valuable, and that time will not have been wasted. I think that exposure is really good, and you can possibly turn that into a mentorship down the line.

**Q: What aspects of surgery do you see changing in the next 30 years?**

A: It’s really hard to tell since the field is changing so rapidly. Artificial intelligence is something that I think is going to have an impact across all of medicine. I believe it’s going to be integrated into everything we do. I think the training process for surgeons is going to be different. The way I trained was resident teaching resident, and from a lay-person’s standpoint, you are, so to speak, “practicing” on people. In the future, I think we will be training surgeons using virtual reality, similar to how the military trains its pilots. What surgery is going to be like by the time you are my age, it’s really hard to say, but I think it’s going to be fundamentally different in terms of techniques and technologies utilized. One thing I am certain of is that it will be better for the patient.

**Q: I hear that you are a big Georgia Bulldogs fan. How important is having interests out of surgery in order to prevent burnout as a surgeon?**

A: It’s critical. You have to maintain your outside interests as you go through. For me, there are certain things that if I sacrificed, I would not be as good as a surgeon. I’ve always tried to be physically active and, given the hour requirements of our career, this can be challenging at times. You have to stick with it because you want to ultimately be a well-rounded person at the end. It’s a challenging specialty that we have chosen, but you should not sacrifice those things that bring you joy in your life. You should pursue them, and through that you will ultimately be a better physician, for both yourself and for your patients. Go Dawgs!
The big day has arrived. The dream can start now.

Those were my thoughts while preparing for my first day as a resident in the program of surgery at the University of Rwanda. Going back to school is always daunting and exciting at the same time. You are fidgeting and wondering about so many things: what clothes should you wear? Will you get along with your new classmates? More importantly, how will you impress your teacher/professor? It is scary and stressful, yet it is fun and mind opening.

Residency, however, is on another level. The pressure starts even before the academic year. We have to undertake a written exam, and only the shortlisted candidates will then participate in an interview with the respective head of departments. There are very few available places for residency in Rwanda. This is due to the high price of school fees as well as the limited infrastructures and resources for proper training. About 98% of the residents are currently sponsored by the government. The competition is slowly rising and getting more and more challenging. The surgical program at the University of Rwanda is now recognized by the College of East, Central and Southern Africa, making it even more competitive. We are now welcoming foreign students into our program.

I was very afraid when I took the exam. I was one of the oldest doctors taking the test and I had already spent more than 3 years working as a general practitioner. I felt very rusty to say the least! The younger doctors looked very confident and seemed to know all the answers. I passed the exam and was allowed to join the first years in the common trunk of surgery. The different sub-specialties all share the same first year, which is mainly focused on the basics of surgery and trauma. We were greeted and welcomed by our seniors: Dr. M and Dr. H. They tried to tell us about what we were going to face during our residency. They were nice and very helpful. They also gave us advice and warned us about what we should not do. They then introduced us to the Head of Surgery. He gave a solemn speech about our new responsibilities, he told us to forget everything that we knew prior to this day, and he told us to relinquish all our old titles and privileges because we had officially started residency. I felt nauseous and very anxious: would I be up for this new experience? Little did I know that all my other teammates were actually thinking the same thing! We were then assigned to different teaching hospitals and started working that very same day.

I was sent to Huye at the University Teaching Hospital of Butare and I started the night duties on my first day. I am what they call a “dystocic”. A “dystocic” is a doctor/medical student who always has about a hundred patients waiting for him in the Emergency Department during his night duties. The night was no different and the emergency team was overwhelmed by the number of patients. They could not understand what calamity had fallen on them. In between two backslabs and an incision of an abscess entered a male patient with a hugely distended abdomen. My first surgical case was a sigmoid volvulus, but I had no clue of what to do. I called in my senior who just told me: “prep the patient; I will be there in a...
few minutes”. I prepared the patient as quickly as possible and tried to quickly read about the condition as I figured that being pimped during the night was worse than during the day. The patient successfully underwent a sigmoidectomy and an end-to-end anastomosis. The senior did it effortlessly, graceful even. I was mesmerized once again by the art of surgery. I had always loved surgery, but I did not know that this feeling would keep on increasing. The whole time I was wondering if I will ever be as good as him in the future. As magically as he appeared, the senior disappeared again. Of course, he had left me with an assignment…to be handed over early the next morning!

Residency in surgery here is incredibly demanding, both psychologically and physically. We usually work for more than 30 to 36 hours consecutively with little to no sleep. I never thought getting a meal would quickly become a luxury. It is ironic how we always have to calculate the daily requirement in calories of our patients, while we don’t even care about our own daily requirements. Whenever I call in a nutritionist, I always wonder if I might not ask him to check on me first. Our workload keeps on increasing: paperwork, duties, assignments, teachings, presentations, and conferences are just some of the tasks we have to accomplish on a daily basis.

The number of patients needing surgical attention keeps increasing exponentially compared to the number of specialists who can attend to those needs. Most of the time, the residents are left alone to deal with most of the emergent cases as we still lack a big enough pool of consultants. The small number of consultants compared to the number of residents also results in a lack of proper mentors who could help in relieving the burnout and stress that the residents suffer from every day. Nevertheless, most of the consultants are all involved actively in the education of the residents. They are all academics, but they usually must try to juggle between their clinical and academic responsibilities.

The program is demanding psychologically as most of the residents have to sacrifice a lot for their patients. They have to sacrifice family time, money, and sometimes their own health. Surgery requires radical choices; choices that will change the lives of our patients, often forever. Patients come to us desperate for an answer, for relief, and we sometimes cannot provide any. For many patients we are their last resort, we are the last stronghold. Unfortunately, sometimes we cannot lift them up, sometimes we can only listen and pray with them. It is very painful as most of the doctors who chose surgery have the tendency to want to come up with a solution. The reality is sometimes very shocking. However, we have to keep on smiling and working because we have to be ready for the next patient who can benefit from our expert hands. There is just no time to breathe or relax.

Our families also feel our burdens and I believe it is even heavier for them. They sacrifice so much for us so that we may become the best of the best. They do not get to see us much, sometimes for months. Most of the residents here are married or are in a committed relationship as strange as it is. I think this helps us keep it together during the harshest days. The love we get when we go home helps wash away all the frustrations of the day.

Surgery is the only specialty that is truly all encompassing, in spite of our reputation of being illiterate butchers! Therefore, we see and learn more than most of our fellow residents in other departments. We are the loudest and the proudest of all the residents. We solve cases that no other specialties are qualified to handle and brag about it all day. We are called everywhere and anywhere. We are the most dependable residents. Here in Rwanda, surgery is young and there is a lot that has to be done. Everything has to be created from the ground up. All that pressure is on the shoulders of the proud surgical residents from the University of Rwanda and their incredible teachers. We are pioneers at home while trying to keep up with modern medicine abroad.

We hold the hope of a whole country in our gloved hands. It is a humbling feeling: joyful and heavy at the same time.

“The patient has arrived. The procedure can start now.”
ROLE OF TECHNOLOGICAL ADVANCEMENT IN THE CONTEXT OF SURGICAL PLANNING AND EXECUTION: PERSPECTIVE OF JEFFERSON SURGICAL FACULTY

By: Nicholas Elmer, Class of 2022
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Over the last several decades we have witnessed rapid technological advancements in healthcare and medicine. Whether it’s the advent of the electronic medical record or the da Vinci surgical system, technological advancements have propelled us into a new era of healthcare delivery and clinical medicine. In addition to the role technology has played in improving medical care, it has also fundamentally changed the traditional medical education paradigm in regard to training students, residents, and fellows. Surgery is a field which has seen profound change in the utilization of innovative medical technology with the revelation of augmented reality-guided navigation, robotics, 3D printing, and artificial intelligence. These modalities have extended what surgeons are able to do in pre-operative planning and in the operating room to provide the most efficient and safe care for their patients. The ultimate goal of the integration of these advancements is to provide physicians and healthcare teams with another set of tools that can support their medical decision-making skills that have been crafted over years of learning and training.

When thinking about the steps involved in carrying out a successful surgical intervention, it begins with thorough planning. As technology in medical science has evolved, so too have the modalities that allow for more effective pre-operative planning. One of the most important aspects of planning is to adopt a mindful approach to the individual patient being cared for. Ongoing developments in data analytics and artificial intelligence will allow surgeons to evaluate population and patient-specific data as it relates to pre-operative risk, intraoperative predictive analysis, and post-operative morbidity and mortality detection and prediction. Therefore, surgeons will be able to garner a deeper understanding of a patient’s probability of having a successful surgery and the associated risk based on analysis of their data. Currently, surgeons are able to utilize the American College of Surgeons NSQIP Surgical Risk Calculator that accounts for patient data and predicts adverse surgical outcomes. As more efficient and validated indices become readily available through improved knowledge of patient-specific surgical risk factors, these metrics will be able to more accurately predict how an individual patient undergoing a certain procedure will respond. Metrics such as laboratory results, diagnostic imaging, lifestyle, fitness, and comorbidities will be analyzed as a whole and presented to the surgeon in the context of the disease, and provide them with the most optimal way to manage the patient. When taken together, the goal is to provide the surgeons with more accurate and inclusive data on the risks that a given surgery presents for that specific patient, and how to best manage their care to limit the chances of a poor outcome.

Dr. Paul DiMuzio is the William M. Measey Professor of Surgery and the Director of the Division of Vascular and Endovascular Surgery at Thomas Jefferson University Hospital. When asked about the role of these technologies in pre-operative planning, Dr. DiMuzio believes that understanding the utility of pre-operative planning with artificial intelligence is important, while at the same time, surgeons must use it as another factor to consider in the medical decision-making process. “It is the responsibility of the surgeon to assimilate all of the appropriate data available to determine better the risks versus the benefits of a particular intervention. Validated computerized algorithms should be used as a complement, not replacement, for excellent surgical judgment requires years to develop.”

In addition to the use of patient data to predict operative risk, innovation has given surgeons the physical tools to develop a surgical plan prior to even stepping into the operating room. One of the most innovative technological advancements in recent years has been the integration of augmented reality (AR) to operative planning and care. In the operating room, AR allows surgeons to project a patient’s imaging studies (CT/MRI) onto their actual body in real time (figure 1) to allow for a more intimate spatial understanding
of the patient’s anatomy. AR navigation allows the surgeon to identify tumor locations, delineate dissection planes and resection margins, and to reduce the risk of injury due to invisible structures or anatomical variations, among many other things. Although still in its infancy in regard to usage, this technology has gained interest in all fields of surgery. There have been numerous preliminary studies demonstrating the utility of this technology in most fields of surgery including neurosurgery, otolaryngology, plastic surgery, urology, and laparoscopic surgical procedures. AR also has widespread application in pre-operative planning and in training surgeons in new techniques.

Dr. Pascal Jabbour is a Professor of Neurological Surgery at Thomas Jefferson University who understands that disruptive technologies and medical innovation play a large role in improving the outcomes of patients. In a paper published in the Journal of Neurosurgery last year, Dr. Jabbour and his colleagues described the advent of endovascular treatment of cerebral aneurysms as a major driver in the disruption of neurosurgical intervention for vascular disease. The integration of this less invasive approach to cerebrovascular pathology has led to a fundamental change in the field of neurosurgery as treatment centers across the world have transitioned to a coil-first strategy. For such vast advancements to occur, like in the example of endovascular treatment, technological boundaries must be pushed. In Dr. Jabbour’s neurosurgical practice, treating via the endovascular approach has led to a need for not only a unique skillset in his support staff, but also in the physical spaces where he operates. The interventional neuroradiology suite is fundamentally different from a traditional operating room as it contains a myriad of highly advanced imaging equipment to accommodate the surgeons in these very tricky procedures. Looking toward the future, as many surgical interventions have transcended into the interventional space, it will be important for surgeons to be able to develop a breadth of skills that extend from more traditional open surgery to interventional and even robotic-assisted.

Technology has come a long way over the last few decades in transforming the way medicine and surgery are performed. The driving factor in surgical innovation, whether it be a change in the treatment paradigm or integration of patient analytics for predicting outcomes, is the desire to improve. Surgeons want to improve their ability to deliver effective care with better patient outcomes, while biotech companies want to improve the utility and precision of their products. The onus is on current and future surgeons to continue to be open, creative, and innovative while at the same time crafting their skills as a clinician. Those who find balance between the ability to adopt the new and the ability to understand the fundamentals will flourish in an era of unprecedented change.

References
INTERVIEW WITH DR. WILLIAM B. HUGHES, DIRECTOR OF THE THOMAS JEFFERSON UNIVERSITY HOSPITAL BURN CENTER

By: Pankhuri Jha, Class of 2022
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The Jefferson Burn Center, now just over a year old, is the newest addition to the myriad of surgical and trauma services offered at Thomas Jefferson University Hospital (TJUH). For over twenty years, TJUH has been an accredited Level 1 Regional Resource Trauma Center, which means it is well equipped with resources needed to provide the highest level of surgical care for trauma patients. While TJUH has been the go-to referral center for a wide variety of trauma-related conditions, residents of the greater Philadelphia area had only a few options to treat their burns - until now. The new burn unit not only offers patients acute care for severe burns and an outpatient office for long term follow-up, but it also provides services for skin grafting, rehabilitation services, and psychological counseling to cater to patients’ long-term needs. In addition to being one of the only burn units in the area affiliated with an academic center, it is unique in that emergency cases can be transported directly to the center from the scene or from other hospitals around-the-clock. Under the direction of William B. Hughes, MD, the burn Center team includes a wide variety of medical care providers including surgeons, nurses, pharmacists, dieticians, physical therapists, occupational therapists, case managers, and social workers, ensuring the most comprehensive care for patients as they recover from their injuries. Dr. Hughes joins TJUH from Temple University Hospital, where he served as the director for the Temple Burn Center for over 20 years. He completed his undergraduate education at the University of Scranton and medical school at Temple University School of Medicine. After completing his general surgery residency at the Medical College of Pennsylvania, where he served as chief resident, and fellowship at the Medical College of Ohio, he began practicing at St. Agnes Burn Center and left in July 1999 to establish the Temple Burn Center. With over 20 years of experience, Dr. Hughes has treated a wide variety of burn injuries, including chemical, thermal, and electrical burns. As a board-certified physician by the American Board of Surgery, his background is in critical care, trauma, burn, and general surgery. Dr. Hughes is an active participant in his community, where he often takes the time to give lectures and seminars about the importance of proper burn care. I spoke with both Dr. Hughes and his wife Michelle, the unit’s nurse coordinator, about his path to surgery, the process of setting up the Jefferson Burn Center and advice he has for aspiring burn surgeons.

Q: What drew you to surgery, and specifically to treating burns?
A: I knew I wanted to go into medicine in the third grade. All I saw growing up while watching television was that doctors did surgery, and that is what I thought was normal. I thought that all doctors operated on their patients, so I always said I was going to be a doctor and operate on people. As I got older, I realized it was a separate specialty with many parts, but I still knew that was what I was going to do. My grandfather on my mother’s side was also a physician, and I spent a lot of time with him on rounds. All of those things got me interested in medicine. During my general surgery training in the early 90s, it was still a requirement to rotate on a burn service. As a second-year resident, I rotated at St. Agnes in South Philadelphia where I met Dr. DeClement, who became my mentor, and we often spoke about me joining his practice. I thought he had a pretty good lifestyle, did incredible work, and I liked doing surgery and enjoyed seeing the patient get better. At that time, I was actually thinking about either plastic surgery and believe it or not, cardiac surgery, but I feel specializing in burn care combined those two interests. I can do a lot of reconstructive, plastics-type surgery and still be actively involved with ICU care. The ICU care is challenging, but I enjoy it and it is a major reason that I really enjoy treating burns.

Q: What is a typical day or week as part of the burn unit?
A: I am in the OR from Tuesday-Friday mornings and have office hours on Monday, Wednesday, and Friday. On the mornings I operate, part of my morning includes making rounds and seeing our inpatients, which is done as a group. Teams are incredibly important when managing burns, which includes myself, Michelle (nurse coordinator), Karina (occupational therapist), Nicole (physical therapist), and Ashley (dietician), among other individuals. We all round together, see patients together, change dressings together, and make decisions about our patients together. During the three afternoons we have office hours, we see a wide variety of cases including minor burn cases referred to us, outpatient visits, and surgery follow-ups.
Q: You emphasize the team approach quite a bit. Why is this method so imperative while managing burns?
A: I absolutely believe it is the way things should be done. Each member of our team knows exactly what is going on and everybody has equal input - so much so, that I often get overruled, but that is just the way it goes. For example, Karina will come into the operating room when I am working on a hand and make custom-made splints that will best suit the patient, right there in the room. You do not see something like that very often. The team approach is very important because everyone on the team is important. As a physician, we often first think about the medical aspect of things but tend to forget the equally important aspects of longitudinal patient care. With a well-rounded team that helps me tackle these other aspects of care, we are seeing a lot less of the complications that we used to see 20-30 years ago. People often wonder how we work so well as a team and my answer is that you just do it. This is the way you have to practice care; it is what is best for the patient.

A (Michelle): The team approach is a standard of care in every burn center. So, we could take this approach, move to a completely different hospital, and have the same role and round the same way.

Q: What was the process like setting up the Burn Center here at Jefferson? Were there any challenges?
A: I think that one of the biggest challenges for us was having to educate the staff in proper burn care, as there are some peculiarities when dealing with burn patients. We were worried that because we were introducing something new, people would be afraid of change. However, I think they quickly realized that we are not throwing anyone to the wolves, and that we do not expect anybody to do things that our team is not trained in doing ourselves, such as changing dressings. It has definitely been a learning curve for everyone, but I believe that our patients have been incredibly grateful. All in all, I do not think we skipped a beat when moving from Temple to Jefferson. Fortunately, my referral pattern followed me here. Plus, we received a lot of support through Michelle and I doing a lot of lectures and community outreach, so my prior patients know where I am and still follow-up with me.

Q: What do you envision for the Burn Center in the years to come?
A: I definitely would like our unit to get bigger so that we are able to reach out and help more people. You always want to have a greater effect in the community and the surrounding areas, which is difficult in our field, because it is generally so small. However, I do see our team doing a lot more education and outreach as well as hopefully some basic research into burn care as opposed to only clinical research.

A (Michelle): If we can reach out to other local providers, the EMS community, and fire prevention to educate them on the first 24 hours of burn care, that will definitely set up the patients for better outcomes.

Q: Training for treating burns can come either from the general surgery or plastic surgery track. What advice do you have for a student who is deciding between those 2 tracks before entering burn care?
A: My training was in general surgery, so I am definitely more biased towards that track. Having followed this track, I know that I can take care of the whole patient. For example, if someone comes in with a stomach problem, I know I can open their abdomen and see what is going on. It is not uncommon for general surgery problems to present in my patients, so in my opinion I should be able to do it instead of passing it on to somebody else. To me, it is critical to learn to take care of the whole patient.

Q: If you had to tell the surgical intern what the single most important thing is regarding taking care of a burn patient, what would that be?
A: I would tell the surgical intern what I believe to be the most important thing about taking care of any patient, and that is paying attention to details. The body is quite resilient, but you cannot let things go awry. You must always have a handle on what is going on. If you order a test, know what the test is. If you order an X-ray, check out the X-ray. In surgery, our days can get very busy and fast-paced, and we have shifted away from a time where we knew our patients much better. In the past, there was less passing off and hand-offs to other physicians, so we often had a better idea of what was normal for the patient, and I do not believe this is as common today. All of us have gone into medicine because it is always in the back of our minds that we want to help people. I think that is what you have to keep in mind, you are here to help people. If you forget that and look at the patient as the gallbladder in room B, I think you miss a lot of details about what is truly going on with the patient. And unfortunately, in a lot of instances, patients may not see their actual physician in the office. Michelle could describe the operations that I do in the operating room, and probably better in some ways, but they want to hear from me. If I take their skin off, they want to see me. And that is absolutely what I am here for.

A (Michelle): I think burn patients in particular are incredibly vulnerable. They really are dependent on the physician. As much as we are a team, if they don’t see him or hear from him every day, then they become anxious about it. Even if he stands in the doorway, waves and says, “Hey you look great today, is everything OK?”, that is a big deal for them. We can all be in the room, but they want to see their physician, and nobody replaces that. Nurses are with them more, but even if it is for 5 minutes, they want to see their doctor. That is who they have their confidence in because that is who saves their life.
Q: Do you believe that learning how to deal with burn injuries has been incorporated enough into medical student and resident training?

A: It is definitely not being emphasized enough. When I was a surgery resident, it was a requirement for us to rotate on a burn service, and now it is only recommended. As a result, what we are seeing is fewer burn physicians. As elder physicians are retiring, there are much fewer people to fill their shoes. Most importantly, students must be exposed to this field. I know that if I was never exposed to it, I would have never thought about it. If I never went to St. Agnes and met Dr. DeClement, I would be doing something else right now. At least the medical students here at Jefferson have some exposure to it while on their general surgery and trauma rotations. While I believe that the training should start at the resident level, there should definitely be exposure to this field for the medical students when they step on the floors. This is a tall task, as there are fewer burn centers than there are medical schools in the country. If students are not exposed early on, how are they supposed to know if they like it or not?

Q: We know that burns often come with scarring, which can be incredibly traumatic from a psychological perspective. How do you counsel patients who feel aghast by looking at their scars left behind by their burns while they recover?

A: You first must able to be able to recognize the post-traumatic stress. Unfortunately, most burns that we see involve the hands and the face, two body parts that are usually not covered, and are always seen by everyone else. When someone breaks their bone, it can heal under the skin, but most people do not watch it heal. With a burn patient, you can see that person covered with burns, discoloration, scarring, and you immediately know what is going on - and they have to live with it for the rest of their life. As I counsel my patients on how to best deal with the scarring and the disfigurement, I reiterate that the person is still the same person who was there before. You are still who you are. You may look different on the outside, but you are still the same person on the inside.

Q: There must be a large psychological toll from treating patients that have such painful and cosmetically deforming injuries. How do you maintain a positive mental attitude when dealing these types of injuries day in and day out?

A: I think it is just the person’s personality. I am generally an optimistic person, so I believe my patients will get better. I’ll tell you, when I see a spark go off in my patient’s head, when they realize that they are going to get better, start doing their exercises on their own, get up out of bed and start living life again, a point we in burn care term ‘turning the corner’, I like that. When I see a patient become an active participant in their own care instead of having stuff done to them, it is empowering. I like seeing people get better and it makes medicine, which is an incredibly demanding pathway, that much better and more fun.

Q: What advice do you have for any future burn surgeons out there?

A: The most important piece of advice is to find what you are most passionate about. I really like doing what I do. It is a long process, but it is definitely worth it. It is very rewarding.
WOMEN IN SURGERY: AN INTERVIEW WITH
DR. KAREN CHOJNACKI, VICE CHAIR OF
SURGICAL EDUCATION AT TJUH

By: Michele Fiorella, Class of 2022
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Throughout history, surgery has traditionally been a male-dominated field. Dr. Mary Edwards Walker, the first practicing female surgeon in the U.S., practiced during the civil war era. However, it was not until 1940 that the first woman was board certified in surgery, as women were not permitted to sit for boards. During the early 20th century, many women interested in surgery were discouraged from pursuing it as a career, and as a result, female surgeons were few and far between. Despite barriers to entry, women have made tremendous strides in the field of surgery. In 1957, Dorothy Lavina Brown, the first African American woman in the American College of Surgeons, became the first woman chief of surgery at any hospital in the United States. A few years later in 1960, Nina Braunwald led the operative team that implanted the first prosthetic mitral valve, which she designed and constructed.

Today, women continue to make progress in medicine and surgery. The number of women graduating from medical school from 1994-2015 increased 43%, and women now make up nearly half of all medical students. Over the same time period, the number of women surgical trainees more than doubled, with the proportion of female trainees increasing 1.1% per year on average. In fact, the number of women in general surgery is on track to reach parity with the number of men in the next 10 years.

Despite the progress women have made in surgery, there are significant gender disparities in academic leadership positions. The number of women assistant and associate professors of surgery have both nearly tripled from 1994-2015, yet women only make up 25% and 19.2% of the totals, respectively. Further, although women are on track to make up half of all general surgeons by 2028, at the current pace it will take until between 2096 and 2136 to reach gender parity for full professors.

The reason for the gender disparity in surgical leadership is multifactorial and has been studied at length. Studies show that women may be deterred from pursuing surgery as a career due to concerns about family and raising children. This attitude is at least partially grounded in reality, as women still bear the brunt of household and family responsibilities. In fact, women surgeons are significantly more likely than men to experience role strain between their family and professional lives. This may be one of the reasons that surgical subspecialties such as surgical critical care and colorectal surgery, which are perceived to offer a greater work-life balance, have made more progress toward gender parity.

Some broad changes have been implemented that may make a career in surgery more viable for many women, including the 80-hour work week cap for residents. Although the cap is not a perfect solution and may disrupt continuity of care, for women interested in having a family it may make pursuing surgery as a career more appealing. One study found that women medical students who completed their surgical clerkships after the 80-hour cap was implemented had more favorable views of surgery as a specialty than students who completed their clerkships prior to the cap. Certainly, the work-life balance issue is an important one which should be addressed; however, it realistically cannot be the only driver to increase the number of women in surgical leadership, as surgeons will likely never enjoy the work hours of colleagues in some other specialties.

Another reason that women may be under-represented in leadership is lack of female role models in surgery. As stated previously, women make up a small portion of assistant and associate professors. This makes it exceptionally difficult for women medical students and residents to seek out female mentors at their institutions. One study of female medical students concluded that students who ranked general surgery first were significantly more likely to have a same sex role model; however, female students were significantly less likely than male students to meet a same-sex role model during their surgery clerkship. Additionally, there is evidence indicating that female students who choose surgery as a career come from institutions with higher proportions of female surgery faculty.

I had the pleasure of interviewing Dr. Karen Chojnacki about her career in surgery and her perspective as a residency program director. Dr. Chojnacki is an Associate Professor of Surgery at Thomas Jefferson University Hospital, and has been a member of the Jefferson faculty since 2002. She is the Director of Thomas Jefferson University Hospital’s general surgery residency program and also serves as the Vice Chair for Surgical Education. She received her medical degree from State University of New York at Buffalo School of Medicine...
and completed her residency training at Thomas Jefferson University Hospital. She completed a fellowship in minimally invasive surgery at the University of Southern California.

**Q: What made you decide to go into medicine? Did you always know this is what you would do for your career?**
A: I went into medicine probably because I grew up watching my father. He’s a dentist. When I was little, we lived in the apartment space above his office, so I used to go down often to get him for lunch or to see what he was up to. And I loved watching him with his patients. He had a great rapport with them, and they seemed to really appreciate him. Even at a young age, I appreciated how much he loved his work. I didn’t like dentistry, but I liked the interaction he had with patients, so that’s probably what sparked my interest in medicine.

**Q: When did you know you were interested in surgery and what influenced your decision to pursue it?**
A: That wasn’t until late in medical school. When I was in medical school, in the early 1990’s, women were groomed to be family practitioners, OB/GYN’s, internists or pediatricians. And it was pretty unusual for a woman to consider doing anything outside of those things. I went into medical school assuming I would do pediatrics or OB and I enjoyed the operative aspect of OB a lot. I liked that you got to do primary care and got to operate. I didn’t really consider surgery at all until my surgery rotation at the end of my third year. That’s when I found the group of residents and attendings with whom I really fit in. I was still nervous about pursuing surgery because there were so few women. So, I tried to keep all of my options open and I applied to OB/GYN and surgery.

**Q: Did you have many female classmates that were interested in surgery? How many other women did you have in your residency program?**
A: There were two of us [from medical school] that went into surgery, from a class of 120. In my residency class I was the only one, and in the entire program there were three: a PGY5, a PGY4, and me.

**Q: Did you find it challenging being one of so few women in your program?**
A: I honestly didn’t think it was an issue. I thought it drove me to be even better because I never wanted anyone to look at me and say, “that’s because she’s the girl in the residency, so we’ll give her a pass.” I wanted to be as good as or better than my colleagues. So, I actually think it was a motivating factor. I wanted the men to have to keep up with me.

**Q: Did you feel like you had a solid number of female mentors throughout your training?**
A: I didn’t feel like I had a great amount of female mentorship, but at the same time I didn’t necessarily feel like I needed it. I felt like I wanted to be mentored by the people that I thought were good surgeons. If those were women, great; if not, I had no issue with asking a man to mentor me. Jefferson was a pretty collegial place so you felt like anyone could mentor you. And I felt very strongly about learning as much from the great surgeons as the less talented. I felt like there was something to be learned from every surgeon.

**Q: How did you handle the challenges of balancing your personal and professional life during training?**
A: It was different back then, this was prior to the work hour cap. Very few residents were married. Of those that were, some managed to stay married, many didn’t. Men had children during residency but none of us [women] even considered it. Back then you lived, ate, slept, and breathed surgery in the hospital. I am also not a Philadelphia native so my whole personal and professional life was here at the hospital. My closest friends were my fellow residents. I don’t know if I could have managed the rigors of residency with the challenges of marriage and child rearing.

**Q: As a program director, how do you see things changing for women in residency programs today?**
A: Things in residency are changing for both women and men. The work hours changed things significantly. That was a paradigm shift in education with the institution of work hour limitations. I think there are good things and bad things about those changes. It has certainly helped residents preserve their families and personal lives much better. I think it has made it challenging to learn as much in five clinical years as before the work hour rules. Today’s surgery residents work a third fewer...
hours per week. And yet they have even more to learn than we did. So, we need to make every patient interaction and every case the best learning opportunity it can be. All of us need to continue to be innovative and intentional about teaching residents.

I think in terms of equality between men and women, there is still work to be done. One way to make women equal in surgery is to give men the same opportunities for family leave that women have. Here at Jefferson there is no paternity leave, which is a problem. So of course, the men are going to look at the women differently when it comes to family responsibilities. It wouldn’t be that way if men could take time off when they are having a baby as well. Until there is parity between what women get for childcare and what men get, it’s never going to be equal. The cure isn’t necessarily to make it easier for women, it’s to make it equal for men and women, I think.

It can still be challenging for women having children in residency. Maternity leave options are not very long: six weeks to be back on your feet after a routine delivery, 8 weeks for a C-section. And the American Board of Surgery has very stringent rules about how many weeks every resident must work to graduate from a program. So, if a woman has a complicated pregnancy or more than 2 pregnancies during the course of your residency, she will have to make up time at the end. This will put her off cycle for graduation and potentially interfere with fellowship career plans. So, it’s very complicated, but still absolutely doable. I’ve had plenty of women come through and have healthy successful pregnancies and thrive and do well. But it’s definitely not equal for men and women yet, and we need to be better about that.

Q: Data shows that there are now relatively equal numbers of men and women going into general surgery training, but there are still significantly fewer women in positions of leadership in academic surgery. Based on your career experiences, do you have any thoughts on why that may be the case?

A: First of all, you just have to do what you love. Any career in medicine is going to be challenging if you want to be great at it. It doesn’t matter if you want to be a surgeon or a family med doc or a pediatrician, if you want to be good at it, you’re going to spend a lot of time doing it. Women shouldn’t worry that the surgical lifestyle is going to take too much from their private or personal life. I don’t think that’s fair anymore because if you want to be successful in any field, chances are it is going to dig into your private time. So, I think if you do what you love everything will fall into place. That has to come first because if you end up not pursuing what you love because of the perceived lifestyle issues you’re going to end up unhappy. And that’s going to be a bigger burden in the long run. I would also say to just forget about the issue of work life balance; it really doesn’t exist. You’ll never have the number of hours in a day that you need to do everything. Dedicate yourself to what you are doing in the moment. Be your best in the present and all will fall into place.

References

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 37 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 to the surgical field through a unique blend of episodic and longitudinal programming that helps bring together students, residents, and faculty in an educational setting.

The crux of the GSS approach to bolstering medical student interest is early exposure. Over the years, the GSS has run many programs specifically targeted at students in the pre-clinical curriculum to increase surgical exposure. Potentially the most influential program is Surgery at Night, which provides an opportunity for students to spend an overnight shift with a surgical resident and intern early in their medical school career; there are typically over 200 such overnight stays by students in an academic year. Students frequently have the opportunity to scrub in on emergent cases and are often instructed in suturing small incisions at the end of cases. Another excellent opportunity for students is the Organ Procurement Program, in which all students who receive the necessary training are signed up for a lottery that allows them to travel and scrub in with the organ procurement team. The most innovative program that has been started by the GSS is the SCALPELS program, in which faculty members and upperclassmen plan a longitudinal surgical curriculum that runs concurrently with pre-clinical curriculum, and offers surgery-specific lecture topics and skill sessions relevant to the underclassmen’s studies.

There are also events that are available to all students. The GSS runs a quarterly journal club, which is led by a surgeon at Jefferson in the field that is currently being studied by the second-year medical students; typically, one “classic” article from the literature is discussed and contrasted with a contemporary article. The basic anatomy and physiology are presented by a first- and second-year medical student, and the findings of the papers are reviewed by a third-year medical student. 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 GSS’s signature event and is run in the spring of each year. Students from all medical schools in the Philadelphia region (six schools in total) 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. The event concludes with a two-hour networking session, either on site or at a nearby venue.

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.

-Tyler M. Bauer, Class of 2020
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Dr. John Heysham Gibbon, Jr. graduated from Jefferson Medical College in 1927, and in a brief series of events, he was named Fellow at Massachusetts General Hospital. In 1930, he found himself assisting Dr. Edward Churchill in an emergency pulmonary embolectomy. At that time the procedure was one of desperation, 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 a successful removal of large clots from the patient’s pulmonary artery, she 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 and his oxygenator to develop a larger 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 repeatedly successful in experiments on dogs. But limitations on the machine for human patients existed and 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 baby, 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 very serious atrial septal defect between the upper chambers of the heart of eighteen-year-old Cecelia Bavolek. This was the first successful intracardiac 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 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 in order for the field to develop, which is why he is often referred to the “father of cardiac surgery”.

JOHN H. GIBBON JR., MD
Dr. Charles J. Yeo was born in East Orange, New Jersey, and attended Spring Valley Senior High School in Spring Valley, New York. He received his undergraduate degree from Princeton University in 1975, summa cum laude, with an A.B. in Biochemistry. Dr. Yeo graduated in 1979 from the Johns Hopkins University School of Medicine, being awarded the Upjohn Achievement Award, and was elected to Alpha Omega Alpha and Phi Beta Kappa. He went on to complete his residency in General Surgery and fellowship in advanced GI and Vascular Surgery at the Johns Hopkins Hospital.

Dr. Yeo joined the faculty of Johns Hopkins University as an Instructor and Assistant Chief of Service in the Department of Surgery in 1985 and rose to the rank of Professor of Surgery in 1996. Dr. Yeo directed the Pancreatic Cancer Interdisciplinary Working Group at Johns Hopkins and served as the Surgical Clerkship Coordinator and Surgical Curriculum Consultant. In 2001, Dr. Yeo received the Alumni Association Excellence in Teaching Award from the Johns Hopkins University School of Medicine. In 2002, Dr. Yeo was named to an endowed chair at Johns Hopkins, becoming the inaugural John L. Cameron, MD Professor for Alimentary Tract Diseases.

On October 1, 2005 Dr. Yeo was named the 8th Samuel D. Gross Professor of Surgery, and he assumed the Chairmanship of the Department of Surgery at Sidney Kimmel Medical College at Thomas Jefferson University in Philadelphia, Pennsylvania. He currently serves on the Board of Trustees of Thomas Jefferson University Hospital.

Dr. Yeo’s primary interests and research have been in the field of alimentary tract surgery, focusing on hepatopancreaticobiliary surgery - the evaluation of patients with pancreatic, biliary, and related cancer, and the management of patients with unusual pancreatic neoplasms, as well as acute and chronic pancreatitis. He travels nationally and internationally teaching and lecturing on the treatment of benign and malignant pancreatic diseases and has personally performed over 1550 Whipple operations.
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