Teaching surgery to medical students:

Perspectives from our mentees

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Surgery is a great field. I know this, and the members of the American College of Surgeons know this, but why don't more medical students know this? During the late 1990s and the turn of the millennium, the number of U.S. medical graduates seeking entry into a general surgery residency dropped, hitting a nadir in 2002.[1-2] These numbers have recovered in recent years; however, the challenge remains in promoting medical student interest in general surgery.

It is clear that surgical education should be modified to maintain the attractiveness of our specialty. In the following article, four authors recommend improvements to the surgical education of medical students. These opinions are from the most important voices of all: the students themselves. Mr. Fuller suggests ways to introduce first and second year students to surgery. Mr. Lin describes the ideal core third-year surgical clerkship and supporting the student entering a surgical subspecialty. Ms. Matsui stresses the importance of teaching surgery-specific ethics and professionalism during the core clerkship. Lastly, Ms. Sobotka gives a list of points on how, during the core clerkship, to engage the student not entering a surgery profession.

Exposure to surgery in the first and second years of medical school

by Lynn "Tut" Fuller

In the past several years, enrollment and interest in many surgical residencies has been decreasing,[3-4] but with an aging patient population, the demand for surgeons continues to rise. This obvious imbalance of supply and demand and its continuing trend toward an ever-deepening supply shortage highlight a disconcerting and pressing issue: Why are fewer medical students interested in becoming surgeons? A lack of exposure to surgery and surgeons in the first and second years of medical school may be a major factor for decreased interest in surgery. In addition to an innate, organic interest in surgery, positive exposure is one of the greatest attractors drawing individuals to enter surgical training programs.[5]

The first two years of medical school are very formative years, and all medical career options are considered. It is during these first two years that most students are open to surgery as a career. Yet, in my case, without having family members or friends as surgeons, my only interactions with surgeons during these years—aside from a surgery interest group provided by the University of Michigan Medical School that will be discussed later—was in a handful of lectures taught by surgeons. Besides those lectures, there were no surgeons acting as professors, small group leaders, or administrators. Instead, we interacted with nonsurgeons whose portrayal of surgery was hardly ever positive and whose descriptions of their own professions were far more engaging.

Looking back on my first two years of medical school, surgeons generally abdicated their roles as educators, mentors, and role models for the matriculating students. Few educated people would choose to work in any profession, much less a field as demanding as surgery, without some reference as to what their life would be like if that was their chosen career. The average surgeon spends approximately 80,000 hours working as an attending, yet after the first two years of medical school, most students have no idea what the average surgeon does in a day or in his or her spare time.[6]

Exposure to the surgical profession in the early formative years of medical school needs to be increased dramatically. I was lucky to have had the opportunity to participate in and help chair the surgery interest group at the University of Michigan Medical School. Once a month, students had dinner at an attending's home; were given presentations by surgeons of various specialties; and received teaching sessions from our host, Mark Orringer, MD, FACS. Students had the opportunity to speak with surgeons during the dinner and throughout the evening on an informal basis. Participants were able to see that surgeons are "normal" people who have homes, spouses, children, grandkids, and pets. Getting a glimpse at life as an attending is instrumental in a student's career choice, as medical school and residency is only a brief part of one's career. Not surprisingly, there is a high entrance rate into surgical residencies among individuals who attend the surgery interest group. Yet, more than dinners or interests groups have to be provided if surgery expects to domestically recruit the individuals it needs.

Almost every field in medicine is projected to have future shortages of physicians. If surgeons wish to mitigate this trend, they cannot be on the sidelines. Surgeons need to fight to recruit talent from a limited pool of medical students. First- and second-year students need exposure to surgery, and the only way this will happen is if more surgeons occupy influential medical school administrative and leadership positions. Surgeons cannot depend on nonsurgeons to advocate for their profession. Only from positions of administrative and educational influence will surgeons be able to curb the negative stigma wrongly associated with their profession. Perhaps surgeons should be given incentives to increase their involvement with the junior classes of the medical school, and this may, in turn, promote more positive, early, and informative interactions with students. The current perception of surgeons being too busy in the operating room to lead a small group, give a lecture, or be actively involved in the medical school is partially responsible for the declining interest in surgery. By changing the culture in which surgery approaches medical education, the profession should expect increased recruitment of medical students into surgery.

Medical school preparation for the future surgical resident: The third-year core rotation

by Giant Lin

I recently completed otolaryngology–head and neck surgery residency interviews, and of the many questions asked of me by interviewers, the one I remember most vividly was: "What do you think it takes to be a good surgeon?" I answered that the requirements were technical skill, inquisitiveness for problem solving, compassion, and mentorship. I was stopped by the interviewer at the mention of strong mentorship. I had hit the "bull's-eye" with this answer, and the interviewer proceeded to educate me about the importance of leading by example.

I have no doubt that strong mentorship in surgery led me to pursue a career in a surgical specialty. I attend the University of Michigan Medical School, a school with a strong emphasis on general surgery education. Our third-year medical school surgery core rotation consists of two months on two separate surgical services. These services include vascular, trauma/burn, transplant, general/endocrine surgery, surgical oncology, and thoracic surgery, and I was assigned to the latter two. On both the thoracic and surgical oncology surgery services, I had the opportunity to assist the attending surgeon and residents and to perform procedures and suturing in a controlled setting. This experience proved invaluable for me as a student of surgery, since I was able to learn valuable surgical skills under close supervision. For example, on the thoracic surgery service, I was taught step-by-step by the attending and her resident how to perform procedures such as bedside tube thoracostomy and removal.

I have always been told that it is better to learn something right the first time than to unlearn a bad habit, and the environment of our school's general surgery experience fosters this approach. I believe that general surgery as a core rotation is important for anyone considering a career in a surgical field because this is the rotation where students learn basic principles ranging from the use of the sterile field and preoperative and postoperative care of patients to problem solving in a surgical consultation. These skills pertain to all surgical specialties as well as other nonsurgical fields such as emergency medicine.

I was fortunate to take part in the thoracic and surgical oncology services. On the general thoracic service, the surgeons and residents actively involved me in their operations, ranging from video-assisted thoracoscopic surgical lung biopsy to transhiatal esophagectomy. It was especially helpful that Dr. Orringer would always wear a camera over his headlight for the education of everyone in the operating room. Before the start of my thoracic surgery rotation, I was given a binder with important and relevant clinical literature, and my expectations for the service were explained clearly. I have a special interest in swallowing function, and Dr. Orringer's technique for outpatient dilation of esophageal strictures fascinated me and prompted me to explore otolaryngology, a field that handles similar problems. In addition, on the surgical oncology service, I appreciated weekly small group sessions with the surgeons to discuss approaches to solid tumor management. I know many students with similar experiences to mine who used an aspect of surgery they enjoyed during the core rotation as a starting point to understand that surgical field better or to explore similar fields.

The current approach to general surgery education from a student's point of view provides appropriate beginner skill sets and high-quality surgical education that is helpful for anyone considering such a career. The breadth of experience, however, does vary depending on the surgical service that one is assigned to. I was fortunate in that my interests in head and neck surgery, specifically swallowing function, overlapped with the services through which I rotated. However, many students may wish to have a longer or wider exposure to different subspecialties in surgery during the core rotation. Expanding the general surgery core rotation to 10 or 12 weeks—with an elective block that includes surgical subspecialties such as urology, otolaryngology, and neurosurgery—could be a useful approach. Expanding the surgical experience of medical students may open new doors for opportunities and mentorship, and I know how influential mentorship can be when it comes to career decisions.

Doing right: Ethics and professionalism in the surgery clerkship

by Jun Matsui

The predicament of doing a clerkship in the field one loves is that the inherent pressures of being a third-year medical student are heightened, the evaluation feels more critical, and the grades matter. For this reason, we students often hesitate to offer our thoughts. Yet, as new initiates to the surgical profession and its established culture, our perspective is close to the patient's own. We are easily impressed by medical miracles that surgeons perform, but we still pause at unprofessional or unethical behavior, and we question why things are done a certain way. Thus, our distinctive ethical viewpoint can remind the medical team of the patient's responses to their care, but it requires encouragement and guidance to maintain. A structured ethics curriculum focused on the medical student experience in the surgery clerkship will support our transition from simply experiencing and observing to learning. Ultimately, we will be learning much more than how to tie a knot or retract the bowel; we will be learning to make and participate in ethical decisions.

A few experiences from my surgery clerkship stand out for me. I remember feeling torn between wanting to participate in patient care and being apprehensive because of how little knowledge and experience I had. I always wanted to suture an incision or put in a line, yet around me there were many people who could perform the procedure more skillfully. The residents encouraged me, taught me, and gave me opportunities to learn and improve. But all along, I felt that my learning was somehow detracting from patient care. For example, one of our patients needed an arterial blood gas, and when offered the chance to learn the procedure, I was thrilled. However, after missing a few times and continuing to try, I wondered if a more experienced hand could have minimized the patient's discomfort and risk.

I remember overhearing slips in professionalism, such as the occasional derogatory comment about a patient's weight or hygiene. These comments and attitudes made up an unspoken curriculum, and the physicians who were observed displaying questionable professionalism were as much role models for behavior at that moment as they were when doing something positive, such as comforting a patient or performing life-saving surgery. To us, the real dilemma was our role as medical students. Do we inform our attending, who is evaluating us and our ability to work with a team, that he or she is being unprofessional when making these comments? Do we say nothing at all and perhaps feel a little worse about ourselves for not speaking up? I often chose the only balance I could find: consulting and discussing with a sympathetic and empathic resident, hoping I'd speak up one day when I was a resident or an attending.

Incorporating a formal ethics and professionalism component in the surgery clerkship will provide a constructive mechanism for medical students to reflect on the ethical issues we encounter and for using these ethical challenges to learn from each other and our preceptors. An ethics curriculum is particularly relevant in surgery, a field that is rich with ethical issues, including informed consent, emergencies, surrogacy, the complexities of pediatric care, and the role of medical students in patient care.

Dedicated time for structured discussions based on medical student narratives would provide the core of this curriculum. Resident and attending participation would strengthen their position as ethical role models and provide an opportunity for medical teams to learn from one another. However, confidentiality, mutual respect, and anonymity are crucial to minimizing medical student distress and conflicts of interest. By selecting moderators with surgical backgrounds and interests in medical ethics—such as surgical and critical care attendings, senior medical students, and surgery residents, all of whom are not currently involved in the evaluation or grading process of the core clerkship—we can avoid the anxiety that speaking candidly could negatively affect our evaluations. The narrative and discussion formats combine individual reflection with the collective processing of ideas. In finding that we are not alone in struggling with these experiences, we will better retain our ideals and deepen our understanding of ethical decision making. As future surgeons, by participating

in an ethics curriculum, we are keeping residents and attendings in touch with patients' viewpoints and developing our own ethical foundations.

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When surgery is off the table: Educating the nonsurgical medical student

by Sarah A. Sobotka

Let's face it: most third-year medical students on their surgical rotation will not enter a surgical field. And truthfully, most of us are not very enthusiastic about waking up at 4:00 am to hold the "learning stick" (an attending's name for the retractor). Yet, the knowledge I gained from the time on my surgical rotation has made a critical impact on my capacity as a future pediatrician to act decisively in emergencies, prioritize complex patients, and communicate effectively. In the spirit of enriching growth and development espoused in pediatrics, following are a few suggestions for enhancing the surgical clerkship.

Medical education during the surgical rotation, like surgical intervention, has several important stages. The first stage is the initial consult and evaluation. Throughout our careers, we will see patients in medical settings and consider consulting surgery. A surgical consult in the emergency room or on the clinical floors is an excellent learning opportunity for all medical students. Which laboratory and imaging tests are helpful? What are the initial steps in a surgical emergency? If possible, students should be given the opportunity to evaluate consults before a surgical resident sees the patient.

The second stage is preoperative counseling. Engage students in the discussions you have with families before and after surgery. We will learn from your ability to discuss outcome probabilities and to deliver good and bad news. At times, you'll provide us with exemplary models of sensitivity within hurried time frames, and occasionally you may offer learning opportunities by showing us less effective modes of communication.

The third stage, the operation, demonstrates the best and worst of teamwork. Within the context of an operation, there are multiple layers of interdisciplinary collaboration. When the primary surgeon uses a video headset, medical students and others in the operating room are easily engaged in the operation; everyone has a front seat at the game. In addition, surgery is unique in its tight cooperation with pathology and radiology to make operative decisions. I fondly remember a conversation I had with a pathologist while he

was analyzing a frozen section. He was eager to teach the diagnostic criteria for cancer staging and offered a unique perspective on the patient's care. Encourage all your medical students, regardless of their affinity for the operating room, to engage with pathologists, radiologists, and anesthesiologists during their surgical rotation.

Time spent rounding on postoperative patients can be an opportunity to teach holistic postoperative care of surgical patients, the fourth stage. What are the time lines and treatment for postoperative complications? When might an additional surgical intervention be warranted?

An additional, potentially loaded issue on any clerkship is evaluations. Some modes of questioning fail to capture critical thinking ability. A favorite attending had an excellent approach of asking complicated questions on surgical decision making in the context of a clinical scenario: "What is the logic behind sentinel node biopsy in this patient and how can the results be used to counsel her? What is this woman's lifetime risk of breast cancer as a 40-year-old compared with a 60-year-old woman?"

Although I've written from the perspective of a nonsurgical medical student, I am not sure it's important to know the future direction of a third-year student. Asking students what field they intend to pursue has a few dangers. Their answers may change, in large part because of their experience on the rotation. When a well-respected chief resident commented on my "natural ability in the operating room," I strongly considered my future as a general surgeon in a way that I never would have if my team had written me off as a future pediatrician. In addition, the students may feel pressured to give you the answer that they think you want to hear and fearful that it may influence the opinion you have of them.

A thoughtful surgical team can educate a third-year medical student about the aforementioned stages of surgical intervention. Perhaps more importantly, an enriching experience on the core surgical clerkship will enable improved cooperation with future generations of internists, pediatricians, emergency room physicians, and so on. The knowledge gained from the core surgical clerkship is crucial for a thorough medical education for all physicians, regardless of whether a career in surgery is on or off the table. Ω

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