Contents lists available at ScienceDirect

Academic Pathology 10/4 (2023) 100094

Academic Pathology

journal homepage: www.journals.elsevier.com/academic-pathology

Commentary

Perspectives from two recent medical school graduates on exposure to pathology during undergraduate medical education: A narrative inquiry

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A B S T R A C T

The field of pathology is facing an inflection point where the demand for pathology services is not being met by a corresponding rise in recruitment into the field. Many of the myths about the field of pathology have been dispelled elsewhere, but there have not been many formal accounts of the experience medical students' face when finding their path to pathology. Because of challenges in the visibility of pathology as a specialty and not simply a subject required for United States Medical Licensing Examination Step 1, students tend to fall into one of two categories: early differentiators or late discoverers. Here, we provide anecdotal accounts of these two paths at institutions with different curricular designs and provide a first-hand account of the challenges we faced and opportunities discovered in our journeys to pathology. Based on these experiences, we offer suggestions for ways to address some of the issues medical students must navigate when trying to explore pathology in curricula not built for such exploration.

Keywords: curriculum, Education, Pathology, Specialty recruitment, Undergraduate medical education

Introduction

Pathology is a vital specialty within the house of medicine. Although it serves as the foundation for most modern medical diagnostic and therapeutic advances, it seldom is given enough dedicated time within the medical school curriculum. Additionally, changes in medical school curricula have either integrated pathology into other courses or shortened the amount of exposure to the specialty to increase the time devoted to the clinical training medical students receive.[1] Further, although the course concepts of human pathology and histology are critical to the formation of adequate clinicians and diagnosticians, they do not fully encapsulate the work of a pathologist or laboratory director. Exposure to the field is available to most students through a dedicated pathology elective during their clinical and elective years; however, this exposure typically ends up taking place later in the student's education and is often too late to serve as an effective recruitment mechanism. With the ongoing rise in demand for pathology services not being met by the current recruitment norms, changes have to be made.[2,3] Though this shortage dates back to the late 20th century, the field has not been able to develop novel means of attracting and retaining talent into the field that sufficiently counteract this trend.[4,5]

To help understand the key issues medical students face when arriving to the final decision of selecting pathology as their specialty of choice, we will share anecdotal accounts from two perspectives through the major milestones of medical school (the application process, preclinical years, and clinical years), as well as a few perspectives on pathology student interest groups. The first perspective (author C.M.L., "Perspective 1") will be from a student who came into medical school with clinical laboratory experience and was initially interested in pathology. This perspective takes place in a medical school with a "classical" curricular layout: two preclinical years with coursework in all the basic sciences followed by two clinical years. The second perspective (author A.P.T., "Perspective 2") will be from a student who came in without a solid interest in pathology and attended a medical school with a shortened preclinical curriculum that was "systems-based." At the end of each section, using lessons learned from our experiences, we will make recommendations for the field moving forward. Our recommendations are summarized in Table 1.

The medical school application and interview process

Perspective 1

Before medical school, I was at least partially exposed to the field of pathology and laboratory medicine as a public health microbiologist and before that as a microbiology technician. Additionally, though I was intimately involved in patient care, namely serving as a laboratorian in a

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https://doi.org/10.1016/j.acpath.2023.100094
Received 26 May 2023; Received in revised form 4 July 2023; Accepted 5 August 2023, Available online xxxx
eISSN2374-2895/

Table 1
Summary of recommendations to improve pathology exposure and experiences for learners.

Issue	Recommendations
Lack of visibility of pathology to learners.	• Encourage pathologist representation in the admissions process. ○ Ideally interviewing candidates. • Encourage pathologist involvement in education in creative ways. ○ Eg. teaching anatomy, facilitating clinical skills sessions, or assisting with case-based learning. • Identify passionate pathology educators and find ways to get them in front of students early. • Represent both anatomic and clinical pathology in pathology-related experiences. • Continue to advocate for innovative means of intercalating pathology into other areas of medical education. • Promote the applicability of pathology-based research to other medical specialties. • Build pathology experiences into the clinical curriculum.
Student and/or provider bias toward pathology	• Be mindful of students projecting the stress of learning pathology for USMLE Step 1 onto the field itself. • Inform clinical colleagues of the impact microaggressions against pathology can have on students. • Encourage clinical colleagues to promote student involvement in pathology experiences.
Deficiencies in the effectiveness of Pathology Student Interest Groups (SIGs)	• Make efforts to accommodate students in their clinical years. • Emphasize joint events with other, more popular SIGs. ○ Eg. internal medicine or surgery. • Offer reviews of testable material using pathology-related methods. • Provide ample opportunities for peer-to-peer interactions between senior medical students pursuing pathology and interested junior students.

major microbiology reference laboratory, many of the medical schools I interviewed with did not consider my work "patient care," and instead opted to refer to my job as "research." Though I was involved with research in my position, the regulations clinical laboratories are held to are decidedly different from those in a research laboratory, and the work I partook in did, in fact, impact patients. Throughout my application process, I was faced with the challenge of which institutions I could apply to where my experience would be meaningful. Though pathology is integral to patient care in every population and setting, some schools were very upfront with me about their goal of training highly qualified primary care physicians to improve healthcare in underserved communities. Though I knew pathologists and laboratorians are needed to accomplish that goal, my experience didn't line up with those with whom I interviewed.

I wasn't a teacher with Teach For America or a Peace Corps Volunteer, and looking back on it, I probably could have expounded about my work and how it impacted underserved communities as well as community and population health as a whole, but at that moment under the scrutiny of an admissions panel and never feeling "worthy" of going to medical school, every interview experience made me feel less certain of myself. What I did in my job felt distant and separated from the people my fellow interviewees were talking about. Additionally, after having the opportunity to interview with numerous faculty from several institutions, I only had the opportunity to interview with one pathologist. Interestingly, when it came time to decide which institution I would attend for medical school, I ended up choosing the only one to put forth a pathologist as an interviewer. Now, that was not the only factor that impacted my decision, but I distinctly remember how refreshing it felt to be able to embrace my work experience and feel like I didn't have to hide what specialty I wanted to go into.

Perspective 2

Prior to medical school, I knew very little about pathology and lab medicine. I had some brief interactions with pathologists through my stem cell research job, but I had no exposure to the job of a practicing pathologist. Going into medical school interviews, my rudimentary understanding of pathologists came from the autopsy doctors you see on TV crime shows. I was not exposed to a single pathologist on the interview trail; not even in passing. My interviewers would strongly emphasize traits associated with patient-facing specialties: rapport-building, empathy, and caregiving. All of these are good traits for any doctor to have, but it put the idea in my head that medical doctors must be focused on patient interaction. I brought some microscopy and laboratory experience to the table. My investment in these skills resulted mostly in skepticism from interviewers, and questioning about why I chose the MD route and not a PhD. These experiences further distanced me from the idea of pathology even before medical school started.

Recommendations

Even before medical school begins, schools may be unknowingly signaling to potential students that pathology may not be valued as highly as other patient-forward specialties. To counteract this, we recommend pathologists be involved in the admissions process. Ideally, they would help with interviewing candidates. This would send the message that interests and skills associated with pathology are also valued. Further, it could offer potential future doctors an introduction to the field. Additionally, it is important for community-health-focused institutions to understand and appreciate the critical role pathologists play in access to care and population health.[6,7]

The preclinical years

Perspective 1

I found the preclinical years fascinating. I always loved learning, but I thoroughly enjoyed taking everything I had learned during my undergraduate and graduate courses, filling in the gaps, and applying all of that knowledge to patient cases and pathologies. My medical school followed a more "traditional" medical school preclinical curriculum where we studied molecular/cellular biology, anatomy, physiology, pathology, and pharmacology separately. We spent an entire year learning "pathology" during our second year of medical school in our course entitled "mechanisms of human disease." This course was by far the most interesting and challenging course in medical school, and I had the opportunity to learn from incredible pathologists. However, the fact that the course wasn't called "pathology" further exemplified how distant pathology has become for medical students. The course was largely taught by pathologists but all of the small group faculty who helped us work through case studies were all patient-facing clinicians and always emphasized the "practical" aspect of the curriculum through their experience. This experience was valuable as a budding student-doctor, but this is where the subtle dichotomy between the pathologist lecturer and clinician educator began.

I was lucky to know many of the pathologists teaching us because I had performed some research in the pathology department and saw what a typical day could look like, but many of my classmates didn't have that exposure. Though my second year of medical school took place during the height of the COVID-19 pandemic, I knew about opportunities to experience pathology in practice from before the pandemic, but many of those experiences were geared toward students in their second year of medical school. However, waiting to expose students to pathology in their second year posed multiple issues that I witnessed: (1) since interest groups were

run primarily by second-year medical students, the student interest group always struggled to recruit leadership to run the organization. (2) many students end up having some idea of what they want by the time they get to second year, and students tended to select more experiences in their fields of interest. Granted, a student's idea of what they want in a career usually changes during third year when they experience the work of different specialties, but I found students liked to pigeonhole themselves earlier to get the research and other experience now seemingly required for residency. (3) Without any presence during the first year of medical school, other specialties were able to capitalize on student interests in various topics without any reference to pathology. For instance, some students excelled in immunology or anatomy or microbiology, and other specialties like hematology, surgery, and infectious disease were able to captivate students with how those interests can tie into a career in their specialty, but pathology was nowhere to be found. This was something I wanted to improve while I worked with our student interest group which is why we ended up forming a position on the board specifically geared toward engaging the curriculum with a position entitled "vice-president of academic engagement."

Perspective 2

The preclinical phase of my institution makes up the first year and a half. It follows an "organ-system" structure in which we would cover the physiology, pathology, and anatomy of the given organ system. There were no dedicated pathology or histology courses. Instead, these topics were used as "educational threads" through each course. Slides were often used as an adjunct to other material. Introductory histology consisted of a few asynchronous videos and minimal lecture time.

Histology did not come naturally to me. Learning it was like learning an entirely new language, one I had minimal background experience in. Trying to understand the basics of histology without a dedicated class was very difficult and time-consuming. Further, we take USMLE Step 1 after our core clinical rotations, instead of traditionally taking it after preclinicals. The classic motivation of Step 1 to learn histology and histopathology was not there for me. Seeing as I did not want to be a pathologist at this time and considering the amount of material I already needed to study, I lacked motivation to put much effort towards basic histology. The difficulty of histology and diminished motivation led to misplaced feelings of frustration and discomfort towards the specialty; feelings that were shared by many of my peers. I distinctly recall my medical school mentor asking me at the end of first year what specialties I was considering. After thinking about it briefly, I responded with "anything but pathology." The one silver lining, which was consistently true throughout my journey, was the quality of the teaching and passionate dedication from pathologist-educators. They simply were not given enough space in the curriculum to have the impact I would have needed.

My perspectives on pathology did not change until my second year. On a whim, I decided to shadow a hematopathologist I really enjoyed learning from in lecture, even though I was still lukewarm on the specialty overall. It was one of the few shadowing opportunities available to me during the COVID-19 pandemic. It was during this shadowing experience that I had the lightbulb moment - I recall thinking "Oh, so this is what a pathologist actually does!" I was surprised by the amount of chart review and clinical context that went into the process. Further, I was inspired by the influence pathologists have on clinical care decisions. I would go on to have several conversations with the hematopathologist about what a career in pathology would look like. I started engaging other pathologists, gaining valuable insights into the variety of subspecialty options. I felt inspired by the passion these pathologists exuded for their work, and was drawn to the wealth of opportunities in the field. I credit the eagerness of these pathology mentors to let me shadow and have lengthy conversations, as well as their kindness, dedication, and patience to me as a student, for my willingness to give pathology an honest chance.

Recommendations

Students respond to passionate educators.[8] We recommend identifying faculty or residents who are outwardly passionate about pathology and eager to engage students. Then, find as many ways to get them in front of preclinical learners as possible. It is difficult to garner interest in the specialty without dedicating the time necessary to expose students to the basics. The rise of organ system-based learning and the shrinking of preclinical time has resulted in less exposure to pathology and histology content. We encourage pathologists to be involved in education in other creative ways that do not directly relate to these topics: teaching anatomy, facilitating clinical skills sessions, or assisting with case-based learning. Not only does this allow passionate pathology educators a direct connection to undifferentiated students early on, it demonstrates to students that pathologists are well-rounded medical professionals.

The preclinical years are critical formative years for medical students. Their experiences during this period can end up shaping what kind of physician they end up becoming. One such experience that is growing in importance is research.[9] Many students participate in research during their preclinical years to get a head-start on that aspect of the residency application.[8] Research in pathology is an effective way to get students into the pathology department while still being able to tie their work to different specialty interests. Pathology-based projects are applicable to many specialties, providing a more flexible research experience that could be spun to "fit in" to different specialty applications.

The preclinical years are also a time students historically view as an opportunity to prepare for USMLE Step 1. The stress of learning all the pathologic entities for this exam can turn students away from the specialty without a second thought. It was thought that the decision to change this exam to a pass/fail system would improve student mental health and engagement with the educational topics.[10–13] Unfortunately, the stress of the exam still permeates the preclinical years, and it is important to recognize that stress when involving students in pathology experiences.

Lastly, when facing extraordinary changes to the preclinical curricula, pathologists in educational leadership positions need to fight for their presence in student education. At its core, pathology is the basis of all of clinical medicine, so it is imperative students learn the basic material. However, when preclinical years get condensed to a single year,[1,14–16] pathology needs to find and advocate for innovative means of intercalating into other areas of medical education, including clinical education.

Pathology student interest groups

Perspective 1

Coming into medical school, I knew that I was interested in the intersection of science and patient care, but I didn't know if I loved the work of a laboratory director. I didn't fully appreciate the breadth of practice available to a physician trained in anatomic and clinical pathology. Though I witnessed some of the work of a laboratory director as well as an infectious disease pathologist, I hadn't even seen the workflow of a typical academic anatomic pathologist. Interestingly, although I previously worked in a reference laboratory and saw the work of a pathologist, my experiences made me think of pathology as a career, but it also made me extraordinarily trepidatious about pursuing a career in pathology because I knew I could also pursue certain areas of laboratory direction with a PhD and not having to go into hundreds of thousands of dollars in debt.

Luckily, there was a pathology student interest group (SIG) meeting at my institution during the first week of medical school. As first-year medical students, we were not supposed to partake in extracurricular activities until after our first exam, so this session was geared mainly toward second-year medical students who recently started learning about pathology in our "mechanisms of human disease" course. I found this session extremely

interesting, and it is part of what got me involved with the pathology department at my institution to begin with. This was the first time I had seen the great breadth of what a pathologist could do, and after this session, I became more energized about pursuing a career in pathology, although I was not yet fully committed to the field. At the bare minimum, this first session was able to dispel many of the myths I had read online[17] and provided more information about the potential career paths available to those who graduate from a pathology residency. The interest group gave me a semi-formalized way of getting more involved with the pathology department throughout my medical school journey which was a great benefit to my career, and I try to instill the benefits such groups could have for medical students who express their interests early. I ended up becoming very involved with our pathology SIG throughout my medical school career, and it was my main goal to get students involved earlier in medical school and incorporate pathology experiences that engage with the courses students were currently in to better capture the attention of students who found passions in different areas of their coursework. Some of the sessions we found particularly successful were talks about molecular pathology during our M1 cellular/molecular biology course, a Halloween in the Morgue session during our M1 anatomy course, a microbiology lab tour during our M1 microbiology course, a histology review session near the end of our M2 year as we prepared for Step 1, and a longitudinal autopsy shadowing notification system where students of any year could sign up and attend an autopsy if their schedule permitted.

Perspective 2

SIGs are utilized by nearly every specialty of medicine at my institution. Even certain subspecialties had their own SIG (e.g. cardiology). With such an abundance of choice, the students that gravitated toward the pathology SIG often had previous exposure or interest in the specialty before starting school. This was not me. I did not know what area of medicine I wanted to pursue prior to starting medical school. I would describe myself as entirely undifferentiated. Much of my time was already monopolized by other important obligations: coursework, studying, and family. The time I had available for exploring SIGs was very limited. Seeing as pathology was not on my radar, what little time I had for career exploration went to larger, more emphasized specialty SIGs like internal medicine.

My interactions with the pathology SIG were limited to a few events that had some connection to either my coursework or another specialty. For example, when we were preparing to take our Neurology exams in October, the pathology SIG presented a Halloween-themed event, "Neuroanatomy of Zombies," tying together the holiday spirit and brain anatomy review for the exam. By the time I had fully embraced my interest in the specialty, I was already in the thick of clinical rotations. Since the SIG leaders are almost always first- or second-years at my institution, events were often catered to the schedules of preclinical students. I found myself unable to join the majority of the pathology SIG events due to my rigorous rotation schedule.

Recommendations

Pathology student interest groups are colloquially credited as one of the most important mechanisms for providing medical students with exposure to pathology.[8] However, perceived SIG relevance or lack of visibility can lead to a more varied and potentially more diverse student audience.[18] Based on the experiences presented here, we assert that pathology student interest groups are certainly important to help expose students to pathology and potentially connect interested students to resources and opportunities. That said, they are by no means the most important or critical means of doing so.

In our experience, the combination of an abundance of SIGs, limited career exploration time, and relative obscurity of pathology as a specialty choice has created an environment where most students do not engage with a pathology SIG. Students that join a pathology SIG in the preclinical years tend to have experience or interest in pathology prior to starting school. These limitations work against one of the core missions of SIGs: exposing undifferentiated students to the possibility of pathology. Further, since SIGs at our institutions catered more to preclinical student schedules, we found it created difficulty for those who developed an interest in the specialty later in their medical school training. To fill these gaps, we recommend pathology SIGs emphasize joint events with larger SIGs, like internal medicine or surgery, in order to expose students who would not otherwise be looking into pathology. Offering reviews of testable material using pathology-related methods, like brain-cutting or autopsy for anatomy review, also seems likely to attract student interest as it efficiently supports studying efforts.[19,20] Additionally, offering experiences that cater to students in their clinical years could also help engage students who were interested during their preclinical years or catch students who found the specialty later.

As a final point, many of the most influential interactions for medical students come in the form of peer-to-peer.[21,22] Pathology SIGs can provide structure for this type of interaction, which can help inspire students to pathology, but is not the only venue to do so. We highly recommend finding ways to facilitate interactions between senior medical students applying to pathology and their junior colleagues. Hearing why fellow students are interested in the specialty can be very convincing to undifferentiated peers. Additionally, the energy these peers offer is vital to the continued success of pathology SIGs–and the SIGs make event organization and student engagement possible. That said, the pathology SIGs are also reliant on these individuals, as many institutions require a minimum level of student involvement and ongoing student leadership for the organization to continue which can be a challenge for pathology when there could be only a few future pathologists in each graduating class.

The clinical years

Perspective 1

At my institution, our core clinical clerkships are spread across our entire third year and part of our fourth year where we spend between one month and two months on internal medicine, neurology, surgery, family medicine, OB/GYN, pediatrics, psychiatry, emergency medicine, and sub-internship time. We were also allowed one elective month during our third year which was a student's only opportunity to explore non-core rotations before being faced with the challenge of selecting and applying to a residency. Though this timeline is changing at my institution, the single elective month during the third year introduced a challenge to students who were relatively undecided. However, because I narrowed down my list of potential specialty choices by the beginning of my clinical years, I decided to use that elective month to rotate through pathology and explore the other specialties I was interested in, namely internal medicine and neurology. This gave me enough time to prepare my application if by some chance I found out pathology was not for me. Interestingly, I ended up tying every experience I had on inpatient services back to pathology and/or laboratory medicine which just further solidified my decision.

Nearly every day, I would find interesting laboratory findings, but there were no formalized mechanisms for talking about laboratory findings with actual laboratory professionals. Instead, the interesting lab results would either be dismissed or validated by the internal medicine residents or attending during rounds. I kept wishing I could have gotten a more thorough background in all the laboratory tests we were ordering every day, so I knew how to analyze and interpret them. Alas, since there were limited methods from within my institution, I ended up learning more about each of the tests, how they are run, and how to interpret them from other online resources. This conundrum continued through neurology where I would spend hours delving into coagulation assays, specifically thromboelastography which was often ordered but the analysis of which was never fully

explained to me. Even in surgery, I always wanted to know how blood products were ordered, matches were determined, and massive transfusion protocols were executed. It's safe to say that the clinical years opened my eyes to the art of laboratory medicine in patient care, but it also showed me that there is improvement needed in medical education in regard to laboratory medicine training.

This lack of training in pathology and laboratory medicine is compounded by the inevitable comments from clinical faculty questioning my desire to pursue pathology. Comments most pathology aspirants have heard such as "you're too good with patients for pathology" or more shocking "oh, so you just care about patients after they die." The comments are usually made in passing and attempt to poke fun. However, if I were not certain about my decision to apply to pathology residency, they could impact how I viewed the field or my career aspirations. All of this is only complicated by the power dynamic. Even though I would get comments that discouraged me, I decided to double-down on my interest in pathology and attempt to respectfully dispel myths in the moment, and in doing so, I ended up being the team member tasked with calling the lab with questions, attending tumor boards, or following up on pathology results. Although I couldn't be a subject matter expert on anything, I still found it fun helping the team get in touch with the point-of-contact on the pathology side and learning more about the tests that were being run, their significance, and their limitations.

Perspective 2

Our core rotations are a year-long; comprising outpatient, inpatient, and surgical specialties interspersed in four three-month long clinical "blocks." At this point in my training, I knew I was very interested in pathology. My mind was not entirely made up, though. I could still feel the lure of patient-facing specialties like internal medicine, or other diagnostic fields like radiology. I was hoping to use rotations to explore these interests further. Unfortunately, there were no formal opportunities for pathology experience during this core year. In fact, I went my first six months without any pathology exposure whatsoever. I wanted to advocate for more experience, but felt I was too green to make these requests. Further, I recall several times when I would bring up my pathology interests to an attending and be met with comments like, "Pathology? But you are so good with patients!" or "Wouldn't you miss patient care?" These microaggressions made me feel like pursuing pathology was somehow not in the purview of a medical doctor; that I would not be living up to my potential or would grow to regret my choices. The power dynamic between an attending and a then-second-year was strong enough that I felt uncomfortable defending my interests, and even began to question them. Eventually, I stopped expressing my pathology interests to attendings altogether.

It wasn't until the start of my third clinical block, surgery, that I gathered my courage. Frustrated with the unresolved question of pathology, I decided I would be very forward about wanting to explore the specialty. I always requested to follow the frozen sections and removed specimens to surgical pathology and would frame it as a time-saving convenience. At our hospital, it can be a bit of a trek to surgical pathology from the OR, and surgeons would often have to wait for an available runner. I would offer to get the specimen there in half the time. Further, I would always ask to examine the gross specimen with the surgeon right after removal. Most attendings were accommodating with my requests, but I had to be the one to make them. Not once did an attending ask that I follow a frozen or other surgical specimen to the pathology suite. This was a similar theme in my inpatient rotations. I would message the pathology residents and ask to review biopsy or cytology results of my patients with them, then present the findings to the clinical team at rounds. I would also request medicine services that I knew contained pathology-adjacent experiences, like hematology, where I could preview all the blood smears and bone marrows. Further, I always took the time to attend tumor board. These pathology experiences were not built in and I would have to go the extra mile to coordinate them on top of my other clinical duties, which often required me to justify my interests and advocate for the specialty.

Recommendations

Medical students often are too intimidated by the power dynamic with attendings to advocate for pathology learning experiences that are not built-in.[23,24] This is especially true if such advocacy is met with microaggressions about the specialty. While these comments may seem innocent enough to some, they do indeed shine pathology in a negative light. Discouraging or joking about a student's interest in pathology is but one example of medical student mistreatment. Although this may sound like "mild" mistreatment, we are certain it can have a real impact on medical student recruitment into the specialty (and we acknowledge this impact has not been studied at scale). Like other forms of medical student mistreatment and microaggressions, clinical educators need to be informed of their impact on medical student careers and mental health. Hopefully, with further improvement in medical school curricula, our future physician workforce will not have similar biases and will avoid engaging in medical student mistreatment in their role as a physician-educator.

In order to shield students from the intimidating power dynamic and empower them to explore pathology without implied judgment, we recommend building experiences into the rotation curriculum. For anatomic pathology exposure, pathology departments could encourage their surgical colleagues to have their students follow a frozen section. Not only would this bypass the need for students to advocate for their own experience, but it could expose students to pathology who would not have been otherwise. Another possibility is making observation of a frozen section a required activity for certain surgical rotations. It would not detract much time from the student experience and would be fairly easy to coordinate. Similar strategies can be employed for inpatient medicine services, encouraging students to follow-up patient biopsies and/or fluid taps; although, that would require more coordination effort. Experiential, hands-on exposure to the field has been shown to be important in recruiting medical students.[18]

In addition to student exposure to anatomic pathology, exposure to clinical pathology and laboratory medicine is also imperative. Though some medical school programs have formalized means of introducing students to laboratory tests, more is needed to have students better understand the labs they are ordering and appreciate the laboratory professionals and physicians working diligently on the other side to deliver the results of those tests. Experiences such as laboratory tours at the beginning of a student's clinical years are one way students can get exposed to the field.[25] However, there could be much improvement to the integration of laboratory medicine training in medical school, such as basic lectures in the analysis of common labs by pathologists during internal/family medicine, or observing a massive transfusion protocol on surgery, or learning about preconception testing from a molecular genetic pathologist during obstetrics or pediatrics or attending plate rounds during internal medicine. These experiences are not only aimed to improve the laboratory medicine competency in our future physician workforce but they also give a face to the team of professionals that students often don't get to see. However, these experiences do not have to be limited to the clinical years, and engaging students in the practice of pathology and laboratory medicine before they reach the hospital wards could improve how they interact with the specialty and view pathologists in the future.

Conclusions

Our anecdotal experiences as medical students interested in pathology highlight the under-accommodating, sometimes unfriendly nature of medical curricula that are not built for these interests. Based on these different yet similar experiences, we make several recommendations to

help improve pathology exposure and experiences for students at multiple stages of education (Table 1). Our hope is that our personal journeys will add to the conversation, sparking new ideas or increasing advocacy to help future students explore this specialty with ease and enthusiasm. Anecdotal, narrative works like this could be used as an adjunct to the more formal, structural analyses being undertaken by larger organizations[3,8,18,26–28] to connect the numerical data with the student experience in hopes of improving medical student exposure to pathology during medical school and increase recruitment to meet the rising need.

Funding

The article processing fee for this article was funded by an Open Access Award given by the Society of '67, which supports the mission of the Association of Pathology Chairs to produce the next generation of outstanding investigators and educational scholars in the field of pathology. This award helps to promote the publication of high-quality original scholarship in *Academic Pathology* by authors at an early stage of academic development.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced this manuscript.

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