

**Head Start:
Exploring Specialties and Establishing
Credentials as a Preclinical Student**

By Samir P. Desai, M.D. and Rajani Katta, M.D.

**For more resources visit
www.TheSuccessfulMatch.com**

A MD2B Publication

Copyright © 2016 MD2B
MD2B, PO Box 300988, Houston, TX 77230
info@md2b.net

Notice: This report is designed to provide information in regard to the subject matter covered. It is sold with the understanding that the publisher and authors are not rendering legal or other professional services. The authors and publisher disclaim any personal liability, either directly or indirectly, for advice or information presented within. No responsibility is assumed for errors, inaccuracies, omissions, or any false or misleading implication that may arise due to the text.

One of my colleagues reached out to me recently. One of her students, Jane, had started medical school, and was seeking advice about how to build her credentials as a pre-clinical med student.

When we spoke, Jane told me about her concerns. Jane is a first year medical student, and she was slowly adjusting to the intense workload in medical school. Early on, though, she began hearing how increasingly competitive the residency match was becoming.

While she wasn't sure what specialty she was ultimately going to choose, she wanted to make sure she was doing everything that she could as a pre-clinical student to position herself well for later success.

She had already heard from some of her classmates that they were shadowing faculty members in different departments. One of her classmates was already applying for research opportunities for the summer after the first year of medical school.

While Jane told me that she definitely didn't have the capacity to do anything intensive as a first year medical student, especially given the time-consuming workload, she did want to find ways to explore different fields. She especially wanted to know if there were any ways that she could build her credentials, even as a first year.

I actually had a number of recommendations for her. Most medical students don't realize how easy it can be to explore different specialties, even as a pre-clinical student. Through these activities, students may have the potential to forge meaningful connections with faculty members.

While this sounds great, most students don't quite know how to move forward.

That's one of the main reasons we created this resource. We wanted to make sure that the students we were mentoring had access to a number of our suggestions and ideas.

We're currently working to make more e-books of this type available on our website. We're also working to provide links to additional resources that we've found helpful, as well as create more resources for our students.

To be updated on these resources as they become available, sign up for our free monthly update at www.TheSuccessfulMatch.com.

Choosing a Specialty: 15 Points to Consider

In a survey of 942 medical students attending 15 U.S. medical schools, researchers surveyed participants at freshman orientation, start of clerkships, and fourth year.¹ At each point, students were asked to name the specialty they were most interested in pursuing as a career. Notable findings included:

- At freshman orientation, pediatrics (20%) and surgery (18%) were the most common choices. Eight percent of freshman students reported general internal medicine as their initial specialty choice.
- 19% were undecided on specialty choice.
- When students were surveyed at the beginning of clerkships and in the fourth year of medical school, researchers found that most students had changed their specialty choice. This was irrespective of their initial freshman choice.

In their conclusion, the authors wrote that “consistent with earlier reports, only 20-45% of medical students ultimately choose the specialty that they had been initially most interested in.”

1 Specialties have been divided into person-oriented and technique-oriented fields, based on whether there is more of an orientation towards people or techniques and instruments. Person-oriented specialties include family practice, internal medicine, pediatrics, obstetrics/gynecology, psychiatry, and physical medicine and rehabilitation. Technique-oriented specialties include anesthesiology, dermatology, pathology, radiology, emergency medicine, surgery, and otolaryngology. In one study, 349 first-year students were surveyed. Among students who indicated a preference for a person-oriented specialty, approximately 70% were found to enter one of these specialties.² However, only about 50% of those with a stated preference for a technique-oriented specialty in their first year ultimately entered one of those fields.

2 Your initial interest in a particular specialty may originate during the basic science years. In some cases, students find the subject matter in a course fascinating, and this leads them to further explore the specialty. Radiologists will often tell you that their enjoyment of anatomy led them to initially consider the specialty. Dr. Falk, a graduate of the Medical College of Wisconsin and a practicing diagnostic radiologist, describes the influence of anatomy on his specialty choice. “I would have to say that the most influential medical school course for me was anatomy, and in particular, neuroanatomy. I remember being amazed that something as complex as the human body could ever develop and function the way that it does. I have fond memories of the hours in the gross anatomy lab with my lab partners, struggling to dissect out and learn all of those structures. My interest in anatomy led to my ultimate career choice in radiology and subsequent neuroradiology fellowship.”³ Anesthesiologists point to coursework in pharmacology as stimulating their interest in the field. Dr. Jerry Reves, Vice President for Medical Affairs and Dean of the Medical University of South Carolina, writes that “the knowledge base required to practice Anesthesiology is primarily in the two general realms of physiology and pharmacology.

Medical students who find these subjects of great interest will love anesthesiology because it is the practice of clinical physiology and pharmacology.”⁴

3 Whatever field of medicine you choose, be prepared for negative feedback. Bashing of specialties is common, and some students have changed their career choices based on the comments of others. In a study of UCSF medical students, 95% of students considering a career in family medicine had received negative feedback about the specialty by their fourth year.⁵ Hunt found that no specialty is immune from bashing, and that 76% of students experienced badmouthing of their specialty choices.⁶ Negative comments can come not only from practicing physicians in other specialties, but also residents and students. In fact, one study found that the most frequent source of badmouthing was students.⁷ Researchers have also looked at the effects of these negative comments, and have found that bashing of specialties can lead to a change in career choice.⁸ In Hunt’s study of over 1,100 students, negative comments led 17% of students to change their career choice. A more recent study showed that 67% of students received non-constructive criticism of their preferred specialty choice.⁹ Most respondents (79%) believed that bashing was unprofessional.

4 Fit with personality, skills, and interests is the most important factor used to determine specialty choice. You can begin to explore fit during the basic science years. In a recent survey of graduating medical students, approximately 97% reported that fit with personality, skills, and interests was moderately or strongly influential in choosing which specialty to pursue as a career.¹⁰ No other factor was given as much importance.

5 While many students wait until the clinical years to assess fit, this approach can be problematic. At most schools, students are required to rotate through the major or core specialties (internal medicine, general surgery, pediatrics, psychiatry, family medicine, obstetrics & gynecology) before pursuing clerkships in other fields. After completing these core rotations during the third year, students aren’t left with much time. Most have two to three months of elective time to explore other specialties before they need to decide, since residency applications are typically submitted in September of the fourth year. In one study of medical students, 26.2% were unsure of their specialty choice at matriculation.¹¹ A similar proportion remained undecided at graduation.

6 Determining your fit for a specialty based on clinical exposure during rotations isn’t always straightforward. Your rotation experience may be affected by the nature of your relationship with the attending or residents, the setting in which you rotate, and the extent and type of your responsibilities. This can make it difficult to accurately evaluate the specialty as a career choice.

7 Dr. Daniel Egan, Associate Director of the Emergency Medicine program at St. Luke’s Roosevelt Hospital, reminds students that “what happens during your medical school rotation is quite different from everyday life in that specialty. For example, in the world of internal medicine, many practitioners spend most of their time in the outpatient setting, forming long-term relationships with their patients. For a surgeon, not every day is spent in the operating room as it is when you are the student. In obstetrics, the labor floor and postpartum evaluations are only a small part of the practice. It is clear that what you see as a student will help you understand what it will be like as a resident in that specialty. But one could argue that even residency may not perfectly emulate a long-term career in that specialty.”¹²

8 During the preclinical years, one way to assess fit for specialties is by completing personality-type inventories. The premise of this approach is that people are most satisfied professionally when there is a good match between their specialty choice and their values, skills, and interests. Commonly used assessment methods include the AAMC Careers in Medicine program and the Glaxo Wellcome Pathway Evaluation Program. The AAMC Careers in Medicine (CiM) is a structured program designed to help students gain a better understanding of their personality, values, skills, and interests. The program also allows for exploration of different specialties. The AAMC writes that “as you work through the CiM program, you’ll gain the tools to make an informed decision, based on guided self-reflection and the information you’ll gather about many career options available to you.”¹³ The Glaxo Wellcome Pathway Evaluation Program, which has been designed to help students make informed specialty decisions, includes self-assessment exercises, an interactive workshop, and a specialty profile book. Many schools offer this program. If not, you can speak with your dean. For more information, contact Glaxo Wellcome at 1-800-444-PATH.

9 The Medical Specialty Aptitude Test is an online test developed by the University of Virginia School of Medicine.¹⁴ It is based on content and material from the book *How to Choose a Medical Specialty*, by Anita Taylor. The website indicates that “you will be asked to rate your tendencies compared to the tendencies of physicians in each specialty. The higher your score for a given specialty, the more similar you are to the physicians in that specialty.”

10 Students often point to mentors and role models as being influential in choosing a specialty. In a survey of third- and fourth-year medical students at UCSF, 96% of all participants rated mentors as important or very important.¹⁵ Unfortunately, recognizing the value of a mentoring relationship is a far cry from developing such a relationship. Although 96% of the participants rated mentors as important, only 36% actually reported having a mentor.

11 Shadowing physicians in different specialties may be enlightening, as Dr. Alfredo Quinones-Hinojosa, a neurosurgeon at the Johns Hopkins University School of Medicine, writes:¹⁶

“I’ll never forget the day. It was as if a light switched on for me. In 1997, I was just finishing my second year in medical school and the Chairman of Neurosurgery at Brigham and Women’s Hospital invited me into the operating room with him. During the surgery I saw this brain exposed to us, and it was so exciting to me. The brain is so intricate and complicated yet so fragile when removed from its protective skull. I would spend my Friday nights in the library reading about the brain and neurosciences. I just fell in love with the brain.”

12 If you’re interested in a particular specialty or specialties, take advantage of opportunities to learn about these fields during the basic science years. Research has shown that your efforts can increase the certainty of your choice.¹⁷ There are a number of ways to learn more about a specialty during the preclinical years:

- Identify and work with a mentor
- Volunteer for clinical experiences (such as shadowing)
- Perform specialty-specific research
- Meet and speak with as many physicians as you can in your specialties of interest
- Attend local and national specialty organization meetings.

If you can make an informed decision, you significantly decrease your chances of having to switch specialties during residency, a process that can be uncomfortable, awkward, and certainly stressful. According to Gwen Garrison, Director of Student and Applicant Services at the AAMC, 30% of residents “either switch from their intended specialty after a transitional or preliminary year or switch outright during their specialty residency.”¹⁸ Dr. George Blackall, Director of Student Development at Penn State University College of Medicine, offers some reasons why residents switch. “Residents primarily switch because they a) realize their initial choice is not as interesting as another specialty, or b) desire a different lifestyle, level of flexibility, or income.”¹⁸

13 Lifestyle considerations are an important issue for students in their decision-making process. Speak with physicians in different specialties to learn more. In the 2010 AAMC Medical School Graduation Questionnaire, over 11,000 graduating students were asked, “How influential was work/life balance in helping you choose your specialty?”¹⁰ Over 70% of respondents reported work/life balance as being either moderately or strongly influential in their decision-making process. Only fit with personality/interests/skills and role model influences were given greater importance. Dr. Robert Cerfolio, a chest surgeon at the University of Alabama at Birmingham School of Medicine, writes that “medical students today are not just book-smart, they are life-smart. They want to work hard and play hard. Priorities have changed and the doctors of today are different from those of yesterday. They should be – hasn’t everything else changed? The importance placed on being able to do things after the work-day is over is higher now than ever. We have listened to our parents, we have taken their advice. We realize and agree that there are more important things in life than just work.”¹⁹

14 In 1989, Schwartz introduced the term *controllable lifestyle* to refer to “specialties that offer regular and predictable hours.” These specialties are often characterized by fewer hours spent at work and less frequent on-call duties, allowing for greater personal time and flexibility to pursue other activities. When the influence of controllable lifestyle and other factors used in the decision-making process was quantified in a recent study, researchers found that controllable lifestyle was the most important factor.²¹ In their conclusion, the authors wrote that “perception of controllable lifestyle accounts for most of the variability in recent changing patterns in the specialty choices of graduating US medical students.” Specialties that are generally felt to offer a controllable lifestyle include anesthesiology, dermatology, neurology, ophthalmology, otolaryngology, pathology, psychiatry, and radiology. Specialties that are generally felt to offer a less-controllable lifestyle include family medicine, internal medicine, general surgery, obstetrics and gynecology, orthopedic surgery, pediatrics, and urology. It’s important to note that within each of these specialties, though, there’s a large degree of variability in practice settings and therefore in the degree of control accorded to physicians. An internist practicing as a solo practitioner has frequent on-call responsibilities. A hospitalist or an internist working for a large group will experience a significantly different work setting.

15 To learn about physician lifestyles in different specialties and in different practice settings, ask questions. That’s the advice Dr. Daniel Egan, Associate Director of the Emergency Medicine Residency Program at St. Luke’s Roosevelt, offers to medical students. “Ask questions not only about the specialty itself but about life outside of work... Try to get a sense of what life is like once residency is over. Residents have a unique perspective on things that may be somewhat limited to the lifestyle they experience during training. These are important issues to understand,

as you will spend several years of your life in that role, but the rest of your life involves many more years after residency training.”¹²

Anesthesiology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Emery Neal Brown is Professor of Anesthesiology at Harvard Medical School. He reflects on why he found anesthesiology so appealing as a medical student. “I enjoyed my anesthesia rotation at medical school. I could see that it was very fast-paced and that you had to make important decisions quickly. That appealed. Plus: the regular hours. I saw myself doing research, as well as working with patients. You need a predictable schedule — which anesthesiologists have — to manage both. It’s also a very important piece of modern medicine. If you think about what occurs when we do surgery, it’s a very traumatic insult to the body. You’re cutting people open, removing organs or possibly even transplanting them. The anesthesiologist puts people into a condition where they can tolerate such extreme assaults.”²²

Anesthesiology is a moderately competitive specialty. In the 2011 NRMP Match, there were approximately 1,400 available residency positions. In 2010, there were 5,443 total residents training in 131 allopathic anesthesiology residency programs.²³ Seventy-nine percent were U.S. MDs, 12.5% were IMGs, 8.1% were osteopathic graduates, and 0.2% were Canadian graduates. There are also 12 osteopathic residency programs offering positions through the AOA Match.

At most schools, anesthesiology is not a required or core rotation. Dr. Sharon Lin, Assistant Professor in the Department of Anesthesiology at the University of California – Irvine, recently surveyed 44 schools, and found that anesthesiology is an elective rotation in 66% of schools.²⁴ For most students, this means that unless you attend a school with a flexible clerkship curriculum, you won’t be able to rotate through the specialty until the beginning of your fourth year. However, there are a number of opportunities to explore the field as a preclinical student.

1 Dr. William McDade, Associate Dean of Multicultural Affairs at the University of Chicago Pritzker School of Medicine, offers an excellent overview of the specialty at the AMA website.²⁵

2 The American Society of Anesthesiology (ASA) Medical Student Component is developing a Mentor program for students in the areas of clinical education in the OR, residency/career advice, and research. Visit www.asahq.org for more information.

3 Jessica Barnes, a graduate of the Texas A & M College of Medicine, describes the impact her mentor had on her ability to match into anesthesiology. “I had a fantastic mentor that led me to choose anesthesiology. When I had questions about my career choice and even concerns about the specialty I was choosing, he was able to give some advice regarding my concerns. They can often give you real life expectations and provide you contacts around the country which is important for interviewing for residency positions.”²⁶

4 Opportunities to participate in anesthesiology research during the summer between your first and second years are available at many medical schools.

5 The Foundation for Anesthesia Education and Research (FAER) offers the Medical Student Anesthesia Research Fellowship to students interested in a career in anesthesiology research and perioperative medicine. This is a two-month research experience with the opportunity to present findings at the ASA annual meeting.

6 Joining your school's Anesthesiology Interest Group is an excellent way to learn more about the specialty, and may offer the chance to meet faculty. In a survey of students applying to the Beth Israel Deaconess Medical Center in Boston, only 64% of respondents attended a school where there was an Anesthesiology Interest Group.²⁷ If your school doesn't have a group, a guide to help establish one is available at the website for the American Society of Anesthesiologists (www.asahq.org).

7 Opportunities to learn more about the specialty, present research findings, and network with those in the field are also available to students who attend the ASA Annual Conference held in October.

8 The ASA has a Medical School Component, and you can take a more active role in this organization by running for one of six positions available in the Medical Student Governing Council.

9 Shadow one of your school's anesthesiologists. Shadowing can be arranged by contacting your school's anesthesiology department or joining the Anesthesiology Interest Group. According to the Ohio State University Department of Anesthesiology, "Shadowing does help! If a student is interested in anesthesiology, many would recommend shadowing because one day actually may be enough to get a feel for what anesthesiologists do. By shadowing for a short amount of time, a student would be able to better assess whether he/she would want to select anesthesiology as a third year elective."²⁸

10 Some medical schools have created a list of faculty members interested in mentoring students. For example, LSU medical students can find anesthesiology mentors through the LSUHSC Mentors program. If there's no such list at your school, you'll have to take the initiative to create your own. You may meet potential mentors through lectures, preceptorships, or interest groups. You may identify potential mentors by speaking with third or fourth year students. You can also schedule a meeting with the clerkship director or program director at your institution, and seek advice on potential advisors.

Dermatology: 10 Ways to Explore the Specialty as a Preclinical Student

“It’s also one of the last corners of medicine where there is what I call ‘real medicine’, clinical medicine, where you look at the problem; analyze it with your eyes. You’re not forever writing lab tests and sending people off to have fancy scans here, there and everywhere. You look with your eyes, listen with your ears, touch with your fingers and you figure out what is wrong with the patient, and that is fascinating and satisfying.”²⁹

Dermatology is a highly competitive specialty. In the 2011 NRMP Match, approximately 370 positions were available. However, 21% of U.S. senior medical students failed to match. In 2010, there were a total of 1,040 residents training in 114 allopathic dermatology residency programs.²³ Ninety-five percent were U.S. MDs, 3.7% were IMGs, 1.3% were osteopathic graduates, and 0.1% were Canadian graduates. There are also twenty osteopathic residency programs offering positions through the AOA Match.

At most schools, students won’t be able to complete a dermatology rotation until the end of their third year. However, for students who take the initiative, there are multiple opportunities to explore the field now.

1 Almost all applicants to dermatology will have performed research, and therefore if you’re considering dermatology as a career, you may wish to participate in research between the first and second years of medical school. In a 2002 survey of 36 departments of dermatology, 21 reported at least one first- or second-year student involved in a case report or series.³⁰ Research experience has significant educational benefits. Beyond those benefits, research allows a student the chance to develop a relationship with their research supervisor. Establishing a mentor-mentee relationship will prove useful during the residency application process when your mentor can provide a strong letter of recommendation, based on significant personal interaction, as well as advocate on your behalf at other programs.

2 There are several sources of funding, such as the Medical Student Grant Targeting Melanoma sponsored by the American Skin Association. Strive for publication in the field. If publication isn’t possible, seek out other opportunities to present your research. Poster presentations or oral presentations at conferences are valuable experiences.

3 Since most dermatology applicants have outstanding USMLE Step 1 scores and grades, the depth of your involvement in extracurricular and community service activities can help you stand out from a sea of highly qualified applicants. The demands of the clinical years can make it difficult to participate in these activities. Your involvement now as a preclinical student can aid significantly when you’re ready to apply.

4 Dermatologists are active in the community, and students have opportunities to take part. Students can participate in Camp Discovery, Camp Horizon, Camp Sundown, and Camp Wonder, all of which provide wonderful experiences for children with a variety of skin diseases. Through the Melanoma Awareness Project, medical students teach children about the sun’s effects on the skin, sun protection, and skin cancer. Miles for Melanoma is a program to raise funds for the Melanoma Research Society. You can seek out local opportunities as well. A number of dermatologists are involved in local clinics that provide care for the uninsured.

5 Since dermatology is often considered the most competitive specialty, find and establish a relationship with a mentor early. Introduce yourself to the dermatology department at your school. Take advantage of any opportunities to meet with the program director and chairman. “Meeting a supportive mentor early in medical school gives one a significant advantage over other applicants who do not find a mentor until much later.”³¹

6 The Women’s Dermatologic Society sponsors the Medical Student Awareness Program. Participants learn about the specialty by working with a dermatologist in academics or private practice.³² This program “targets medical students in schools that lack a division or department of dermatology.” First- and second-year students are given preference for the program.

7 The American Academy of Dermatology (AAD) has a Diversity Medical Student Mentorship program. This program allows students from “ethnically and socioeconomically diverse backgrounds to gain exposure to the specialty of dermatology by providing a firsthand, one-on-one mentorship experience with the dermatologist of the student’s choice.”³³

8 Shadow a dermatology faculty member at your own school, or in the local area, to learn more about the specialty. Arrange a shadowing experience by contacting your school’s dermatology department or joining the Dermatology Interest Group.

9 Joining your school’s Dermatology Interest Group is an excellent way to learn more about the specialty. According to the Dermatology Interest Group Association (DIGA), 63 medical schools have an interest group. If you'd like to establish a group at your own school, a guide is available at the DIGA website.

10 Attend a conference. The American Academy of Dermatology holds its annual meeting in February. A Summer Academy Meeting takes place in August. Students can present their research findings at these meetings, and network with physicians in the field. The American Osteopathic College of Dermatology holds its annual meeting in October.

Emergency Medicine: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Sorabh Khandelwal, Director of the Emergency Medicine Clerkship at Ohio State University, describes what draws many medical students to the specialty. “It is a field that is full of excitement. It truly is a constant adrenaline rush. Life and death decisions are made at the bedside literally in seconds in many patients and this truly is a powerful and humbling experience at the same time. Our field covers an amazing breadth of medicine. Almost every journal in any specialty will have some article that is useful to an emergency physician. Perhaps you have heard the phrase regarding an emergency physician, ‘jack of all trades, master of none’. It is true to an extent, however we believe we are masters at resuscitation and acute care medicine. Aside from a challenging work arena, emergency medicine allows for an active social life outside of medicine. This is a big reason why many people choose Emergency Medicine.”³⁴

Emergency medicine is a moderately competitive specialty. In the 2011 NRMP Match, there were over 1,600 available residency positions. However, nearly 10% of U. S. seniors failed to match. In 2010, there were 5,119 residents training in a total of 155 allopathic emergency medicine residency programs.²³ Eighty-one percent were U.S. MDs, 7.4% were IMGs, 11.5% were osteopathic graduates, and 0.1% were Canadian graduates. There are also over 40 osteopathic residency programs offering positions through the AOA Match.

At most schools, exposure to emergency medicine is limited until the fourth year, when students have greater flexibility to participate in an EM clerkship. However, opportunities to explore the field are available earlier. Dr. Shahram Lotfipour, Associate Dean for Clinical Science Education and Clinical Professor of Emergency Medicine at the University of California – Irvine, offers the following advice for preclinical students.³⁵ “Students exploring EM should seek out clinical exposure, interact with EM faculty, participate in EM organizations, and increase their knowledge of EM literature.”

1 Given the competitiveness of the specialty, establishing a relationship with a mentor early in the process will be helpful. According to Dr. Gus Garmel, Co-Program Director of the Stanford-Kaiser Emergency Medicine Residency Program, finding a mentor is not easy.³⁶ “How students find faculty mentors is challenging, because their exposure to a broad selection of emergency medicine faculty may be limited early in their training.” Dr. Garmel encourages students “to seek out mentors from faculty committed to their well-being, personal and professional growth, and success within the specialty.”

2 The Society for Academic Emergency Medicine (SAEM) has a virtual advisor program. This program allows students who attend schools without an emergency medicine residency program to interact with faculty elsewhere. For DO students interested in the field, the American College of Osteopathic Emergency Physicians (ACOEP) has established a mentor program for students. There are over 2,000 osteopathic emergency medicine physicians.

3 Most medical schools have an Emergency Medicine Interest Group. Membership allows students opportunities to explore the specialty further by engaging in clinical observation, research, and community service. Leadership positions are also available.

4 While many students have an idea of what emergency medicine involves, there's no substitute for real-life experience. That's why shadowing EM physicians becomes so important. In a study

done at the University of Toronto, preclinical students participated in an EM observorship experience.³⁷ Researchers found that this experience allowed students to make more informed decisions with respect to EM as a career.

5 Dr. Jamie Collings, former Program Director of the EM residency at Northwestern University, states that “I think that students should spend time shadowing, but also talking to practicing EM physicians about the good and the bad of the specialty. Also, if you are really interested in EM, make sure you shadow on a Friday or Saturday during the night (a room full of drunk patients may not be what you envision).”³⁸

6 At schools with academic emergency medicine departments, there are often opportunities to participate in research during the summer between first and second year. If you're interested in performing EM research during this time, consider applying for the Medical Student Research Grant, which is jointly sponsored by SAEM and the Emergency Medicine Foundation. Medical students are also eligible to apply for a Research Grant from the Emergency Medicine Residents' Association (EMRA).

7 Research findings may be presented at the American College of Emergency Physicians (ACEP) Research Forum. The Best Medical Student Paper award is given at the meeting.

8 For students interested in community service, Local Action Grants are available through EMRA. Grants are awarded to students for projects that improve community health, such as through education, direct services, or preventive programs. Grants are also awarded for projects that support the specialty through community awareness, advocacy, or involvement with local and state government.³⁹

9 To learn more about the specialty, consider attending the American College of Emergency Physicians Scientific Assembly meeting (October), SAEM Annual Meeting (June), and American Academy of Emergency Medicine (AAEM) Scientific Assembly (February). The American College of Osteopathic Emergency Physicians has two annual conferences – the Fall Scientific Assembly and the Spring Conference. Both conferences offer students opportunities to interact with residency programs and faculty.

10 For students interested in taking a more active role in the American Academy of Emergency Medicine, consider running for a position in the Medical Student Council.

Family Medicine: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Cynthia Romero is a family physician and Chief Medical Officer of the Chesapeake Regional Medical Center. After graduating from Eastern Virginia Medical School, she completed a residency in family medicine. As a family physician, she enjoys the continuity of care the specialty provides. “The best part of being a primary care physician is the continuity of care that I can have with my patients – being able to both prevent injury and illness through health maintenance and take care of people when they are sick. Caring for all of my patients’ needs is very rewarding and satisfying. I get to know them as individuals.”⁴⁰

Family Medicine is not a competitive specialty. However, securing a position in highly coveted residency programs is difficult. In the 2011 NRMP Match, there were approximately 2,700 residency positions available. In 2010, there were 9,583 residents training in a total of 451 allopathic family medicine residency programs.²³ Forty-four percent were U.S. MDs, 39.1% were IMGs, 16.7% were osteopathic graduates, and 0.1% were Canadian graduates. There are also over 80 osteopathic residency programs offering positions through the AOA Match.

1 Family physicians are active in the community, and many welcome student participation. Through the American Association of Family Physicians (AAFP) Tar Wars program, health care professionals annually reach out to over 500,000 fourth and fifth-grade students to discourage children from smoking. Since most Family Medicine Interest Groups are involved in community service, joining your school’s group is an excellent way to learn how family medicine physicians are able to impact their communities.

2 You can learn more about the specialty by joining your school’s Family Medicine Interest Group. For information on how to establish or maintain an FMIG at your school, a useful resource is the FMIG Manual, available at <http://fmignet.aafp.org>. If your school has an established group, you’ll have the opportunity to run for officer positions, such as president, community service coordinator, and student membership coordinator. According to the Virtual Family Medicine Interest Group website, “many FMIG leaders go on to hold leadership positions at the state and national levels of the AAFP throughout their careers.”⁴¹

3 As with any field of medicine, one of the best ways to learn about the field is to observe and speak with practicing physicians. Family medicine physicians are actively involved in preclinical education through Physical Diagnosis and Introduction to Clinical Medicine courses. You can approach these faculty and ask about shadowing opportunities. You can also identify opportunities through your school’s Family Medicine Interest Group.

4 While preclinical interactions can help you identify potential mentors, you can also directly introduce yourself to the family medicine department. Osteopathic students can identify mentors through the Mentor Exchange program developed by the American Osteopathic Association. The American College of Osteopathic Family Physicians is another organization that can help students locate mentors. State organizations are also involved in mentoring. For example, the Osteopathic Surgeons and Physicians of California has a mentoring program for students who are members of the organization.

5 Most schools provide opportunities to perform family medicine research during the summer between the first and second years of medical school. Organizations such as the American Academy of Family Physicians (AAFP), Society of Teachers of Family Medicine (STFM), and the North American Primary Care Research Group (NAPCRG) also provide students with research opportunities.

6 Funding for your research project may be provided by your school. You can also apply for external grants or awards. The AAFP awards Student Externship Matching Grants to support students pursuing research opportunities in Family Medicine. State chapters are another source. For example, the Minnesota Academy of Family Physicians awards grants to students interested in family medicine research projects through their David Mersy, M.D. Student Externship Program.

7 Students who have performed family medicine research may be eligible for the NAPCRG Student Family Medicine/ Primary Care Research Award.

8 Research may be published in journals or presented at conferences. These include the AAFP Scientific Assembly (fall), National Conference of Family Medicine Residents & Students (early August), AMSA National Conference, NAPCRG Annual Meeting, and the American College of Osteopathic Family Physicians Annual Convention. Opportunities to present research may also be available at state meetings and conferences. For example, the Arizona Osteopathic Medical Association has an Annual Clinical Case and Poster Presentation.

9 Student chapters of the American College of Osteopathic Family Physicians (ACOFP) exist at many osteopathic schools. ACOFP encourages students to “build leadership skills by participating and running for office in the ACOFP student chapter on campus.”

10 The AAFP holds its annual meeting in the fall. It also holds the National Conference for Medical Residents and Students in August. The AAFP Foundation provides scholarships for students to attend the National Conference. The AAFP writes that these funds enable students "the opportunity to explore Family Medicine through clinical sessions, procedural workshops and interaction with family physicians across the country." The American College of Osteopathic Family Physicians holds its Annual Convention in March. The convention's Residency Fair allows students to meet with program directors and residents representing many of the 150 AOA-approved programs.

Internal Medicine: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Robert Waterbor is an internist at the Eisenhower Medical Center in California. As a medical student at Duke University, he was attracted to internal medicine for several reasons. “I went into internal medicine because I believe a good internist is equipped to be a good detective. We see whatever comes through the door, and it can be anything from a surgical problem to an obscure medical diagnosis, and part of our job is to be able to recognize when something serious may be going on....Besides liking the detective aspect of the field, I do like the long-term commitment to patients that goes along with it. Getting to know patients is not only gratifying in its own right, but really enables me to assess their health a lot more easily.”⁴²

Internal Medicine is not a competitive specialty. However, top tier residency programs receive thousands of applications for a small number of positions, and matching with one of these programs is difficult. In the 2011 NRMP Match, there were approximately 5,100 available residency positions. In 2010, there were 22,415 residents training in a total of 380 allopathic internal medicine residency programs.²³ Forty-nine percent were U.S. MDs, 44.6% were IMGs, 6.4% were osteopathic graduates, and 0.1% were Canadian graduates. There are also over 100 osteopathic residency programs offering positions through the AOA Match.

Following an internal medicine residency, graduates may practice as internists (outpatient primary care, hospitalist) or pursue fellowship training in a subspecialty. Subspecialties of internal medicine include allergy, cardiology, endocrinology, gastroenterology, geriatric medicine, hematology/oncology, infectious disease, nephrology, pulmonary medicine, and rheumatology.

Polls of the general public have demonstrated a poor understanding of what internists do. New med students are often confused as well. Dr. Mahendr Kochar, Senior Associate Dean for Graduate Medical Education at the Medical College of Wisconsin, says that “if you ask members of the general public, they don’t have a clue, unless they are already under the care of an internist. Even incoming medical students are at a loss when you ask them what internal medicine is.”⁴³ In this section we provide suggestions on ways to learn about the specialty.

1 The American College of Physicians (ACP) has created a Mentoring Database. To access the database, which includes program directors, clerkship directors, chairs of medicine, practicing internists, and residents, you must be a member. Mentors are available to answer “specific questions about scheduling your summer preceptorships, getting through the match, and preparing for clerkships and residency interviews...”⁴⁴ The database allows you to narrow the list of potential mentors based on specialty, geographic location, type of practice, gender, ethnicity, and other factors. If you're not sure how to select a mentor from the database, ACP can pair you with an appropriate individual depending on your interests or specific questions.

2 Participation in research is an excellent way to explore internal medicine or one of its subspecialties. Medical schools often provide summer research experiences in internal medicine. The Ohio State University Department of Internal Medicine has funded positions for entering second year students. Students may conduct a basic science or clinical research project. “The student will play a participatory role and take an active part in reviewing literature, executing experiments, collecting data, analyzing, interpreting results and writing manuscripts.

Dissemination of results through publication and presentations is expected and advantageous to a student's career."⁴⁵

3 Medical student members of the ACP may enter abstract competitions at both the local and national level. Abstracts can be submitted in one of four categories – clinical vignette, basic research, clinical research, and quality improvement/patient safety. Winners of the National Clinical Vignette and National Research Paper competitions are showcased at the ACP annual scientific meeting.

4 ACP IMPact is an internal medicine newsletter published monthly by the American College of Physicians. The newsletter does accept submissions from medical student members. Through past articles, students have shared study tips, informed colleagues of helpful resources, and offered tips to survive medical school.

5 Networking opportunities are available to students who attend national conferences. At the annual scientific meeting of the ACP, students can interact with physicians in the field, meet residency program personnel at the Internal Medicine Residency Fair, and attend a Medical Student Mentoring Breakfast.

6 Shadowing is an excellent way to explore the specialty. Nearly all medical schools have an Internal Medicine Interest Group, and opportunities to shadow are often available through the group. At the Uniformed Services University of the Health Sciences, students can arrange such experiences by contacting the leadership of their Club Med organization. "Our faculty are eager to have students visit their clinics and procedure suites to see first-hand what internists do!" USUHS students have seen patients on the general medicine wards and subspecialty clinics. They have also observed a variety of procedures, including cardiac catheterization, video bronchoscopy, and gastrointestinal endoscopy.⁴⁶

7 Your Student Affairs Office may have a list of internal medicine physicians who are interested in having students shadow them. Dr. Isaac Wood, Associate Dean of Student Affairs at Virginia Commonwealth University School of Medicine, has created the guide *Exploring Career Options in Medicine*.⁴⁷ In the guide, he lists "contact information for faculty who would be happy to meet with you, talk about their work and arrange a shadowing experience so you may become better informed."

8 If your school has an established mentoring program, you may be able to identify a mentor in the field through the program. Another option is to approach your advising or student affairs dean for his or her advice. Since physicians practicing internal medicine or a subspecialty are often heavily involved in the preclinical curriculum, you may encounter potential mentors through your courses, small group discussions, and preceptorships. Mentors may also be identified through internal medicine interest groups, school alumni offices, and referrals from junior and senior medical students.

9 Internal Medicine Interest Groups (IMIGs) are well-established at U.S. medical schools. If your school doesn't have a group, turn to the IMIG Resource Guide available at the ACP website for information on bringing a new group to life. ACP's IMIG Sponsorship Program provides

funding for groups, and additional funds are made available to groups who reach certain recruitment levels. Participation in your school's IMIG will provide exposure to the specialty, provide opportunities to network with residents and faculty, facilitate shadowing, and allow you to run for leadership positions.

10 Osteopathic medical students interested in internal medicine can become members of the American College of Osteopathic Internists (ACOI). Through the organization's mentoring program, you can be paired with a physician in the field. Chapters of the student branch, known as the Student Osteopathic Internal Medicine Association (SOIMA), are active at osteopathic schools.

Neurology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. George Richerson is Professor and Chair of the Department of Neurology at the University of Iowa. He was drawn to the specialty of neurology because he found that the brain was more interesting than any other organ in the body. “I was attracted to the challenge of understanding how it works and curing diseases that affect it,” says Dr. Richerson. “Patients with disorders of the nervous system often present with unusual symptoms and signs and can be challenging and fun to diagnose. There are already treatments for many of these patients. Recent progress in developing treatments for others has been astounding, and is continuing at a pace much faster than most fields in medicine. It is exciting to be part of that progress and to try to contribute to it. It is also gratifying to be able to treat patients with neurological diseases that other physicians either do not recognize or don’t understand well enough to know how to manage.”⁴⁸

Neurology is not a competitive field. In the 2011 NRMP Match, approximately 600 positions were available. Ninety-eight percent of U.S. seniors successfully matched. However, highly coveted neurology residency programs remain quite competitive, and it is challenging to secure a position in these programs. In 2010, there were 1,928 residents training in a total of 126 allopathic neurology residency programs.²³ Fifty-five percent were U.S. MDs, 36.6% were IMGs, 7.9% were osteopathic graduates, and 0.1% were Canadian graduates. There are also 7 osteopathic residency programs offering positions through the AOA Match.

Neurology is heavily covered in U.S. medical schools during the preclinical portion of the curriculum. Neuroanatomy and neurophysiology may be a component of anatomy and physiology courses, or may be covered in a separate neuroscience course. If you have an early interest, there are considerable opportunities to explore the field as a preclinical student.

1 Research in the field can provide significant exposure and the opportunity to work closely with faculty members. In many schools, students can perform research in the summer following first year. Funding to support research may be available through schools or through external sources such as the American Academy of Neurology (AAN). Students who are members of their school’s Student Interest Group in Neurology are eligible to apply for the Medical Student Summer Scholarship sponsored by the AAN.

2 Preclinical students are eligible to apply for the Summer Program in the Neurological Sciences sponsored by the National Institute of Neurological Disorders and Stroke.

3 The Child Neurology Foundation offers the Swaiman Medical Scholarship. This is a summer clinical research experience open to first and second year medical students.

4 The Parkinson’s Disease Foundation has a Summer Fellowship Program for students interested in performing Parkinson’s-related summer research.

5 For students interested in researching myasthenia gravis or a related neuromuscular disorder, consider the Myasthenia Gravis Foundation of America’s Henry R. Viets Medical/Graduate Student Research Fellowship.

6 The American Brain Tumor Association (ABTA) offers the Medical Student Summer Fellowship program for students interested in performing neuro-oncology research. At the end of the fellowship, students are required to submit a report. Following review of these reports, an outstanding medical student is chosen to receive the ABTA Lucien Rubenstein Award.

7 With over 150 chapters in the United States and Canada, it's likely that your school has a Student Interest Group in Neurology (SIGN). Membership allows opportunities to shadow neurologists, learn more about the field through lectures and presentations, and apply for SIGN scholarships. For information on starting or running a chapter, the American Academy of Neurology (AAN) has developed the SIGN Reference Manual, available at their website.⁴⁹

8 First-hand observation of a neurologist in clinical practice is invaluable. You can often arrange shadowing experiences with faculty members at your institution. According to the American Academy of Neurology, shadowing will allow you to “get a glimpse of a-day-in-the-life of your potential future profession.”⁵⁰

9 Since members of the neurology faculty are often involved in preclinical education, you may be able to meet and establish mentor-mentee relationships through these interactions. The American Academy of Neurology recommends that you “choose a mentor who makes you comfortable, shares your interests, and has an interest in you. Get to know the neurology faculty at your medical school by attending Grand Rounds, resident teaching conferences, or SIGN events.”⁵⁰

10 The AAN holds its Annual Meeting in April. The AAN and the Association of University Professors of Neurology have combined their efforts and make scholarships available to fund students interested in attending the meeting.

Neurological Surgery: 10 Ways to Explore the Specialty as a Preclinical Student

According to the Women in Neurosurgery organization, “neurosurgery appeals to those individuals who find the human brain fascinating and who enjoy the physical act of correcting abnormalities of the nervous system. Although the intellectual challenge of constant learning and change may draw an individual to neurosurgery, it must be coupled with a strong desire to be an interventionist, willing to make decisions and take responsibility for those decisions. No two operations are exactly the same, and much time is spent considering the various options before choosing an approach to a problem. Stress and the challenges of dealing with critically ill patients are everyday occurrences for neurosurgeons. They must be able to cope not only with death but also with the very real and difficult decisions regarding the most vital functions of the brain and spinal cord such as the ability to think, speak, see, move, and feel. Neurosurgeons are asked to communicate complex concepts to patients and family members about quality of life and risks versus benefits of surgical procedures on the most delicate organ in the body.”⁵¹

Neurosurgery is a highly competitive specialty. In the 2011 NRMP Match, 195 positions were available. However, 14% of U.S. seniors did not match. In 2010, there were 1,140 residents training in a total of 101 allopathic neurological surgery residency programs.²³ Eighty-nine percent were U.S. MDs, 10.5% were IMGs, 0.4% were osteopathic graduates, and 0.1% were Canadian graduates. There are also 11 osteopathic residency programs offering positions through the AOA Match.

In a survey of U.S. medical schools, only 33% of schools offered neurosurgery rotations to third year students.⁵² Therefore, most students won't have the opportunity to perform a neurosurgical rotation until their fourth year. If you've developed an early interest in the field, however, there are a number of ways to explore the field prior to your clinical rotation.

1 In the document *So, You Want to be a Neurosurgeon*, the Women in Neurosurgery organization encourages students to “get to know neurosurgeons in active practice and spend time with them and residents training in neurosurgery. There are many different styles of practice and a wide variety of personalities can be found in neurosurgery...Shadow a neurosurgeon to see what his or her life is like.”⁵¹

2 Not every medical school has a neurological surgery residency program. If you don't have access through your school, organizations that can put you into contact with neurosurgeons include the American Association of Neurological Surgeons, Congress of Neurological Surgeons (CNS), Women in Neurosurgery, and Council of State Neurosurgical Societies (CSNS).

3 The NYU Department of Neurosurgery offers a Summer Intensive in Neurosurgery. During this 8-week rotation at Tisch Hospital, students are active members of the neurosurgical team, working closely with both residents and attending physicians. The goal of the intensive is for students “to fully understand what neurosurgery is all about so they can make an educated decision about whether it is for them or not.” Although priority is given to NYU students, the program is open to other U.S. medical students.⁵³

4 Dr. Ellen Shaver, Associate Professor of Neurosurgery at the Medical College of Georgia, writes that “in the preclinical years, it is helpful to identify a mentor or faculty advisor to

recommend possible electives, research opportunities and residency programs of interest to you.”⁵⁴ Because you may have limited interaction with neurosurgical faculty until third or fourth year, your initiative will be key to establishing a relationship with a mentor early in your education. Introduce yourself to the neurosurgery department at your school. In particular, take advantage of any opportunities to meet with the program director and chairman.

5 The Women in Neurosurgery organization has developed a mentoring program that pairs the medical student with an experienced neurosurgeon.

6 Schools with neurosurgery departments often provide opportunities to perform research during the summer following first year. Preclinical students are eligible to apply for the Campagna Scholarship, which supports a 10-week summer neurosurgical research experience with a mentor at the Oregon Health & Science University.

7 The Department of Neurosurgery at Cedars-Sinai Medical Center offers the Pauletta and Denzel Washington Family Gifted Scholars in Neuroscience Award. During this summer fellowship, awardees work in a research laboratory at Cedars-Sinai under the supervision of Dr. Keith Black. “Awardees are expected to submit an abstract or scientific paper on their research to a national neuroscience, cancer, or neurosurgery meeting.”⁵⁵

8 The American Association of Neurological Surgeons offers summer fellowships for medical students who want to perform neurosurgical research (Medical Student Summer Research Fellowship Program). CNS and CSNS offer the Medical Student Summer Fellowship in Socioeconomic Research, an award given to students conducting research on a socioeconomic issue affecting neurosurgical practice.

9 Joining your school’s Neurosurgery Interest Group will help you learn more about the specialty. However, many schools lack a group or have groups that have become inactive. Explore ways to start a group at your school.

10 The Congress of Neurological Surgeons holds its annual meeting in October. The Annual Meeting of the American Association of Neurological Surgeons takes place in April. Students may be able to present their research findings at these meetings and network with physicians in the field.

Obstetrics and Gynecology: 10 Ways to Explore the Specialty as a Preclinical Student

In reflecting on his career in obstetrics and gynecology, Dr. Mark Rowe, a faculty member at the Texas A & M Health Science Center College of Medicine, could not imagine choosing a specialty more exciting. “What could be more exciting than looking back over a generation of deliveries?” says Dr. Rowe. “I have had the opportunity to bring many new lives into the world and have on occasion seen some back as grown-up patients.” For Dr. Rowe, the specialty “was the right combination of basic science of reproductive medicine and the clinical practice of medicine. The science that forms the basis for the specialty is intellectually stimulating and the patient relationships are personally satisfying.”⁵⁶

Obstetrics and gynecology is a moderately competitive specialty. In the 2011 NRMP Match, there were approximately 1,200 available residency positions. Six percent of U.S. senior medical students failed to match. In 2010, there were 4,884 residents training in a total of 243 allopathic obstetrics and gynecology residency programs.²³ Seventy-four percent were U.S. MDs, 16% were IMGs, 9.5% were osteopathic graduates, and 0.1% were Canadian graduates. There are also 29 osteopathic residency programs offering positions through the AOA Match.

Obstetrics and gynecology is a core clerkship, and all medical students are required to rotate through the field during the clinical years. For most students, this is often their first exposure to the specialty.⁵⁷ However, opportunities to explore obstetrics and gynecology are available to preclinical students, and are described below. “Exposing medical students to women’s health care earlier in their career can help encourage greater awareness, interest, and motivation, while helping to avoid misperceptions,” writes Dr. Peter Schnatz.⁵⁸

1 The American Congress of Obstetricians and Gynecologists (ACOG) has produced a video for medical students. Titled “Choose Ob-Gyn for Women’s Health,” the video is available at www.acog.org.

2 The Association of Professors of Gynecology and Obstetrics (APGO) has developed several documents of interest for students – *Basic Science Prerequisites to a Clerkship in Obstetrics and Gynecology* and *Comprehensive Women’s Health Care: A Career in Obstetrics and Gynecology*. These documents are available at www.apgo.org.

3 Preclinical students often take lectures or courses on Women’s Health, and you’ll have opportunities to meet OB/GYN faculty through these interactions. Other opportunities include welcome lunches, career panel discussions, and meetings of the medical student OB/GYN interest group. “Shadowing a physician in private practice, doing some research for a summer, and talking to a student-friendly faculty member in giving advice are good ways to gain exposure,” says Dr. Eugene Toy, Residency Program Director of OB/GYN at The Methodist Hospital in Houston.⁵⁹

4 Schools often provide opportunities to perform research during the summer between the first and second years of med school. In the Obstetrics and Gynecology Summer Research Program at Jefferson Medical College, students work with a research-oriented faculty member and have opportunities to “shadow, observe, and become involved in the clinical offices, operating room, labor and delivery, grand rounds, journal club and clinical meetings.”⁶⁰

5 At ACOG's Annual Clinical Meeting, students can attend the medical student course and luncheon, residency fair, and student workshops. Registration and membership are free for students. ACOG divides its members into regions or districts based on geography. Medical student members can also attend their Annual District Meeting.

6 ACOG has developed a list of obstetricians and gynecologists interested in mentoring students. To access the list, you must become an ACOG member. Dr. Eugene Toy offers advice for students seeking a mentor. "The two most important factors are availability/interest of the faculty member, and experience/expertise of the faculty member to give good advice. Other factors include honesty and integrity, confidentiality, and the mentor's placing the students' interests as higher than one's own or the institution's."⁵⁹

7 Learn more about the specialty by joining your school's interest group. There are over 120 active medical student OB/GYN interest groups. A guide to starting a new group is available at the ACOG website.

8 Obstetricians and gynecologists are active in the community, and in many cases students may join them. At UCSF, students can volunteer in the Women's Clinic of the Homeless Clinic. At the University of Kansas, students provide Women's Health education at a local women's shelter and participate in the Susan G. Komen Race for the Cure.

9 Osteopathic students may learn more about the specialty by becoming members of the American College of Osteopathic Obstetricians & Gynecologists.

10 Students can explore residency programs through an online residency directory available at the APGO website.

Ophthalmology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Adam Abrams is an ophthalmologist in private practice in California who completed his residency training in the Department of Ophthalmology at the University of California Irvine. “I have always had a passion for fixing things,” says Dr. Abrams. “As an ophthalmologist, I am challenged by fixing complicated medical problems. Today, with so many exciting technologies available, the solution to vision problems has never been more within reach.”⁶¹

Ophthalmology is a highly competitive field. In the 2011 NRMP Match, there were approximately 460 available residency positions. However, 12% of U.S. senior medical students did not match. In 2010, there were 1,268 residents training in a total of 117 allopathic ophthalmology residency programs.²³ Ninety-three percent were U.S. MDs, 6.5% were IMGs, 0.9% were osteopathic graduates, and 0.1% were Canadian graduates. There are also 13 osteopathic residency programs offering positions through the AOA Match.

In 2000, 68% of medical schools required an ophthalmology rotation. By 2004, the percentage had decreased to 30%.⁶²

1 At the American Academy of Ophthalmology (AAO) website, information is available for students interested in the specialty. Students can learn about the practice of ophthalmology, subspecialties, and the basics and structure of residency programs.

2 Ophthalmologists are involved in service work in the United States and abroad through such organizations as Unite for Sight, Operation Access, ORBIS, Volunteer Eye Surgeons International, Eye Care America, and Prevent Blindness America. Medical students can also participate. Participation in community service can enhance your ophthalmologic knowledge and eye examination skills while providing a much needed service.

3 Shadow an ophthalmologist. According to Dr. Andrew Lee, Chairman of the Department of Ophthalmology at The Methodist Hospital, “shadowing both a private practice eye MD or an academic faculty member might allow the student an insider glimpse into the practice of ophthalmology, and can create a mentoring opportunity that could lead to an important and convincing letter of recommendation downstream.”⁶³

4 Many schools have an Ophthalmology Student Interest Group (OSIG). Through your involvement in this group, you can learn more about the specialty and gain access to busy clinical faculty. Exposure to the specialty will allow you to assess whether your “personality matches the ‘ophthalmology personality type’” says Dr. Lee.⁶³

5 Schools often provide opportunities to perform research during the summer between the first and second years of medical school.

6 Summer Student Fellowships are available to med students interested in eye research through Fight for Sight. The organization has also partnered with WomensEyeHealth.org to offer a summer fellowship entitled “Understanding Gender Disparities in Eye Health.” Fellowships are also available in ocular immunology and cornea study.

7 The Bascom Palmer Eye Institute, affiliated with the University of Miami Miller School of Medicine, offers short or long-term research training opportunities for medical students.

8 Research grants for medical students are also available through the Sjogren's Syndrome Foundation.

9 For students interested in a longer period of research, Research to Prevent Blindness offers a one-year fellowship with \$ 30,000 grant support.

10 Medical students can present their research at local, regional, and national conferences such as the Association for Research in Vision and Ophthalmology.

Orthopedic Surgery: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Stephen Ritter is an orthopedic surgeon with Methodist Sports Medicine in Indiana. As a medical student at the University of Iowa, he recalls being attracted to the field of orthopedics because “it combines both the science and the art of medicine. The ability to alter form to improve function requires skill, attention to detail and an appreciation of what an elegant and intricate structure the human body is. When you are responsible for trying to help a patient return to their normal lifestyle, it is very important that they receive nothing less than complete honesty.”⁶⁴

Orthopedic Surgery is a highly competitive specialty. In the 2011 NRMP Match, approximately 670 residency positions were available. However, 23% of U.S. senior medical students failed to match. In 2010, there were 3,412 total residents training in 152 allopathic orthopedic surgery residency programs.²³ Ninety-six percent were U.S. MDs, 2.9% were IMGs, and 1.0% were osteopathic graduates. There are also 33 osteopathic residency programs offering positions through the AOA Match.

In a survey of U.S. medical schools, only 55% had mandatory instruction in musculoskeletal medicine, defined as “a preclinical module or clinical clerkship in orthopedic surgery” or related field.⁶⁵ According to Dr. Peter Stern, Chairman of Orthopedic Surgery at the University of Cincinnati, “orthopedic surgeons are underrepresented on curriculum committees, resulting in underexposure of students to orthopedic practice during the preclinical years.”⁶⁶ Therefore, many students won't gain exposure to the specialty unless they actively seek out experience. Dr. Chris Reilly, a faculty member in the Department of Orthopedics at the University of British Columbia, writes that “students may be exposed to a specialty late in their education,” and this may result in less competitive applications.⁶⁷ For students who may be considering this field, it's therefore important to begin exploring opportunities now.

1 Because you may have limited interaction with orthopedic surgery faculty until third or fourth year, your assertiveness will be key to establishing a relationship with a mentor early in your medical education. According to the Department of Orthopedic Surgery at Wake Forest University School of Medicine, “make yourself known to the orthopedic faculty at your own institution. Contact one or more of the attendings and introduce yourself as a prospective orthopedic residency candidate. Just get to know them and allow them an opportunity to know you.”⁶⁸ In particular, take advantage of any opportunities to meet with the program director and chairman. Some students are able to establish a mentor-mentee relationship with the help of their school's orthopedic surgery interest group.

2 The American Academy of Orthopedic Surgeons (AAOS) has created a Mentoring Program. Information about the program, which was developed primarily for minorities and women, is available at their website.

3 The J. Robert Gladden Orthopedic Society is an organization that seeks to increase diversity in the specialty, and offers mentoring and networking programs for medical students.

4 There's no better way to begin learning about the field than by watching an orthopedic surgeon in action. Many faculty members welcome student observers. To arrange a shadowing

experience, begin by checking with your dean's office. Some will maintain a list of faculty members with an interest in having student observers. If there's no such list, you can directly contact the orthopedic surgery department.

5 According to Dr. Nitin Bhatia, Program Director of the University of California Irvine residency program, performing research in the field will definitely improve your chances for obtaining a residency position.⁶⁹ Schools with orthopedic surgery departments often provide students with opportunities to perform research during the summer between the first and second years of medical school.

6 The Hospital for Special Surgery sponsors the Medical Student Summer Research Fellowship, a two-month program for students who have completed their first year of medical school. Students have opportunities to perform basic science, translational science, or clinical research under the supervision of a faculty mentor. Observation of orthopedic surgical procedures is also available. Although Weill Cornell Medical College students are given preference, the program is open to students at other schools.

7 The Children's Hospital of Philadelphia (CHOP) has an orthopedic surgery research program open to students attending accredited medical schools.⁷⁰ According to the program, "the ideal time commitment is at least three months with a minimum goal of having a published article or public presentation on the obtained results." For students interested in a longer period of research, CHOP also offers the Orthopedics Medical Student Clinical Research Award. This is a one-year experience dedicated to performing clinical research before either the third or fourth year.

8 The AAOS holds its Annual Meeting in February. To offset the costs of attending the conference, the Ruth Jackson Orthopedic Society provides up to \$ 1500 each to two students.

9 The American Osteopathic Academy of Orthopedics holds its annual meeting in conjunction with the American Osteopathic Association in October. Students may have opportunities to present their research findings at these meetings, and network with physicians in the field.

10 Joining your school's Orthopedic Surgery Interest Group is an excellent way to learn more about the specialty. However, many schools lack a group or have groups that have become inactive. If your school does not have a group, consider starting one. Doing so may fulfill a need at your school, much like the Vanderbilt Orthopedic Interest Group has done. Through the efforts of the group, Vanderbilt medical students gain early exposure to the field by linking students with mentors and introducing students to orthopedic research.

Otolaryngology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. David Oliver is an otolaryngologist in private practice in Savannah, Georgia. He is a graduate of the Medical University of South Carolina otolaryngology residency program. In medical school, he was intrigued by the specialty, and remains attracted to otolaryngology for the same reasons. “I went to medical school and became intrigued by the diversity of the ENT specialty. I treat every age group from newborns to the elderly, men and women, have a significant office practice, and perform a variety of surgeries. I was also attracted to the complexity of the ENT specialty. The anatomy and physiology of ear, nose, and throat are poorly understood by patients and other doctors and the management is intricate. There are many special sense (smell, taste, hearing, special, singing, etc.) and cosmetic concerns in the ear, nose, and throat.”⁷¹

Otolaryngology, commonly referred to as ENT [ear, nose, and throat] is considered a highly competitive specialty. In the 2011 NRMP Match, approximately 280 positions were available. Fourteen percent of U.S. senior applicants failed to match. In 2010, there were a total of 1,424 residents training in 103 allopathic otolaryngology residency programs.²³ Ninety-seven percent were U.S. MDs, 2.6% were IMGs, 0.2% were osteopathic graduates, and 0.2% were Canadian graduates. There are also 15 osteopathic residency programs offering positions through the AOA Match.

In all of the highly competitive specialties, an early start can provide a strong advantage in the residency match. Early involvement in the field can lead to important connections, mentoring, research opportunities, and opportunities for leadership, publication, presentations, or awards. An early start can be difficult in ENT, though. In a survey of U.S. medical schools, otolaryngology was a required third-year rotation at only 33.6% of schools.⁷² Therefore, most students won't be able to rotate through the ENT department until their fourth year of medical school. We've outlined ways in which preclinical students can develop their own opportunities to explore the field and excel in the field.

1 In order to learn more about the field, it's best to speak with and observe ENT physicians. Shadowing experiences can be ideal, and most students can find opportunities to shadow faculty at their own institution. However, not every medical school has an otolaryngology surgery residency program or department. If you don't have access through your school, the American Academy of Otolaryngology – Head and Neck Surgeons may be able to help you.

2 Students can also work with otolaryngology residents. Some schools provide formal opportunities to do so, while at other institutions you'll have to arrange your own experiences. At the University of Pittsburgh, preclinical students can observe and assist ENT residents in their on call duties on weeknights and weekend days through the ENT Buddy Call program.

3 Most students will have limited interaction with ENT faculty until the third or fourth year of med school. Therefore, you'll need to take the initiative to identify potential advisors and mentors, and establish those relationships. Most students begin by scheduling a meeting with the designated student contact in the ENT department. This may be a faculty member, chairman, program director, or clerkship director. During your preclinical years, you should also take advantage of any opportunities to meet with these individuals. Since otolaryngologists are

sometimes involved in preclinical education through anatomy lectures and physical diagnosis instruction, you may be able to meet and establish relationships through these venues.

4 Almost all students who apply to otolaryngology will have performed research. Starting early can provide students with more significant opportunities to participate. Many schools with ENT departments provide opportunities to perform research during the summer after first year. Dr. Venu Divi, Program Director of the otolaryngology residency program at Drexel University, encourages students to be productive in research. “Ideally the research should be completed and published by the time the application is due. Research specific to otolaryngology is best, but experience which can be utilized for future projects, such as basic science research, is also useful.”⁷³

5 Preclinical students who are members of underrepresented minority groups are eligible to apply for the Johns Hopkins Department of Otolaryngology Medical Student Mentoring Clerkship Program. Through this program, students may perform a three-month clinical and/or research rotation at Hopkins. Students must have completed at least one year of medical education to be considered.

6 Funding for medical student research is available through several organizations, including the American Academy of Otolaryngology - Head and Neck Surgery, American Head and Neck Society, and American Academy of Otolaryngic Allergy. Students seeking funding for one year of research can apply for the American Head and Neck Society – Pilot Grant.

7 Interest groups provide valuable opportunities, starting with the chance to learn more about the specialty. Some schools lack ENT interest groups, or have inactive groups. If that's the case, you can start one and thereby fulfill a need at your school. The purpose of the ENT interest group at the University of Virginia School of Medicine is to “expose students to this exciting field” and “foster shadowing, mentoring, and research opportunities between faculty and students.”⁷⁴

8 The American Academy of Otolaryngology – Head and Neck Surgeons holds its Annual Meeting in September. Students may be able to present their research findings at these meetings, and network with physicians in the field.

9 The American Academy of Otolaryngology – Head and Neck Foundation offers a Medical Student Research Paper Prize.

10 The Association for Research in Otolaryngology has offered awards to students in recognition of research contributions. Glenn Schneider, a medical student at the University of Rochester, received a fellowship award to cover travel expenses so that he could attend the organization's annual meeting. There, he was able to present the results of his research project on deafness.⁶

Pathology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Justin Bishop is a chief resident in the Johns Hopkins pathology residency program. He discovered a passion for pathology during his pathology elective. “During my pathology elective it became clear that it was the field for me. The importance of the pathologist’s diagnosis was astonishing; the course of treatment, along with the patient’s prognosis, was entirely dependent on the impression of the pathologist, the ultimate consultant. The field struck me as very cerebral; pathologists are required to have knowledge of virtually every disease process that can affect every organ in order to diagnose them. Finally, I was struck by how vast the field was. Even though at that time I did not know what subspecialty of the field I would go into, I discovered that Pathology encompassed areas ranging from molecular diagnostics to clinical chemistry to forensic pathology. I knew that I would find my niche.”⁷⁶

Although pathology is a course taken by students during the preclinical years, study of the subject matter, in and of itself, won’t allow students to properly explore the specialty as a possible career choice. In a survey of second-year students from 5 medical schools, Dr. Lorne Holland, Assistant Professor in the Department of Pathology at the University of Colorado, found that students often had misconceptions of the field.⁷⁷ He concluded that “better education about the practice of pathology in the second year” is needed. Similar findings were found when researchers met with focus groups of senior medical students.⁷⁸ “This study indicates that despite relatively abundant preclinical exposure to pathology, students ‘don’t even get what pathologists do.’”

Pathology is not a competitive specialty. However, securing a position in one of the top tier programs remains challenging. In the 2011 NRMP Match, approximately 520 positions were available. In 2010, there were 2,355 residents training in a total of 147 allopathic pathology residency programs.²³ Sixty-two percent were U.S. MDs, 31.3% were IMGs, and 6.5% were osteopathic graduates.

1 Explore the specialty by reading *Pathology as a Career in Medicine* published by the Intersociety Council for Pathology (ICPI). Other publications worth reading include *A Career as a Pathologist* and *Top 10 Myths about Pathology*. Both are available at www.asip.org. Budding clinician scientists will be particularly interested in *The Road to Becoming a Clinician Scientist in Pathology and Laboratory Medicine* published by the American Society for Investigative Pathology (www.asip.org). Among the questions addressed in the publication are “Why choose academic pathology and laboratory medicine?” and “Is a physician scientist career for me?”

2 Membership in the American Society for Clinical Pathology is complimentary for medical students, and is an excellent way to learn more about the field (www.ascp.org). For students who have a specific question about pathology, the College of American Pathologists has an “Ask a Pathologist Your Question” service.

3 To observe the responsibilities of a practicing pathologist, start by checking with your school for a list of pathologists able to provide shadowing experiences. You may also be able to identify a pathologist open to observers through the interest group at your school. Some pathology departments, such as that at the University of Massachusetts, have developed formal observership programs for preclinical students. The Department of Pathology writes that “most

students go through medical school, especially the first 2 years, having little exposure to pathology as a medical specialty. The observership will provide an opportunity to see what pathologists really do in their day-to-day life – the important role they play in patient care, what type of ‘lifestyle’ they have, etc.”⁷⁹

4 Establishing a relationship with a mentor is an excellent way to learn more about the field. Since pathologists are often actively involved in preclinical education, you may be able to identify a mentor through your coursework. Students are also encouraged to visit their school’s department of pathology, and initiate relationships with key faculty, such as the program director or chairman. According to the University of Chicago, “specialty advisors should be experienced in the appropriate clinical arena, have time and ‘chemistry’ with the student, and have a broad view of the field.”⁸⁰

5 Join your school’s pathology interest group. If no chapter exists at your school, consider starting one. ICPI provides Medical Student Interest Group (MSIGs) Grants to schools to start new groups or enhance existing groups.

6 In schools with academic pathology departments, students will often find opportunities to participate in pathology research during the summer following their first year. The American Society for Investigative Pathology (ASIP) sponsors the Summer Research Opportunity Program in Pathology. This program, which targets underrepresented minority students, allows students to participate in research at prominent institutions. For students interested in a longer period of research, some schools offer a one year experience.

7 Medical students may be honored with the Award for Academic Excellence and Achievement by the ASCP. Each medical school’s pathology department can nominate a single second-year student. To be eligible, students must attend school in the US, Canada, or Puerto Rico. Recently, 47 second-year students were honored.

8 Wondering about work-life balance as a leader in the field? In the February 2011 ASIP Trainee Newsletter, Dr. Dani Zander, Chair of the Department of Pathology at Pennsylvania State College of Medicine, offers her perspective.⁸¹

9 The ASCP Resident Council annually surveys residents and fellows about the fellowship application process and job market for pathologists. Survey results are available at www.ascp.org.

10 Concerned about the cost associated with attending a pathology conference? ICPI offers the ICPI Trainee Travel Award to support trainees who wish to participate in scientific meetings of one of the member societies.

Pediatrics: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Steven Czinn is Chair of Pediatrics at the University of Maryland. Soon after starting medical school, he discovered his love for pediatrics. “When I was in school, I saw that there is nothing more rewarding than taking a child who is ill or suffering, and making him feel better. To see the look on the child’s face, and the look on the parents’ face, is such an extremely satisfying feeling. I decided then that this was what I wanted to do.”⁸²

In a survey of over 900 students attending 15 U.S. medical schools, pediatrics was the most commonly chosen specialty choice among freshman medical students.¹

Pediatrics is not a competitive specialty. However, securing a position in a highly coveted residency program is difficult. In the 2011 NRMP Match, nearly 2,500 positions were available. In 2010, there were 8,140 residents training in a total of 198 allopathic pediatrics residency programs.²³ Sixty-seven percent were U.S. MDs, 23.9% were IMGs, 9.3% were osteopathic graduates, and 0.2% were Canadian graduates. There are also 17 osteopathic residency programs offering positions through the AOA Match.

1 Since many schools have incorporated primary care preceptorships into the preclinical curriculum, you may be able to request a pediatrics preceptor. You may also locate preceptorships separate from your medical school. The Texas Pediatric Society has implemented a General Pediatric Preceptorship Program (www.txpeds.org). Through this program, students “are placed with pediatricians in private practice for a four-week period to learn at a practical level about general pediatric practice.”⁸³

2 To arrange a shadowing experience, check with the dean's office for a list of interested faculty members. If there's a Pediatrics Interest Group at your school, you may locate a physician to shadow through the group. You can also arrange to shadow by directly contacting your school's pediatrics department.

3 Since pediatricians are actively involved in preclinical education, you may locate a mentor through your coursework. In a survey of pediatric clerkship directors, it was learned that 63% taught in the preclinical years, with 23.5% having administrative responsibility for a preclinical course.⁸⁴ Some schools have created a list of faculty members interested in mentoring students. If no such list exists, you may directly introduce yourself to your pediatrics department. Take advantage of any opportunities to meet with the program director, chairman, or clerkship director. Mentors may also be located through your school's Pediatric Interest Group.

4 Pediatricians are active in the community, and students have opportunities to take part. You can directly contact the involved pediatricians, or you may be introduced to these activities through your involvement in a pediatrics interest group. According to the American Academy of Pediatrics, these groups offer “numerous opportunities to serve the public and children through community-oriented projects. Some of these projects give you practical training interacting with pediatric populations.”⁸⁵

5 In her second year, Georgetown student Allison Heinly was actively involved in community service through her school's interest group. “This past year she has headed the pediatric interest

group, which hosts holiday activities, coordinates a book drive, and donates proceedings to the pediatric inpatient unit at Georgetown University Hospital. She also volunteers with the Georgetown Medical Student – Patient Partners Program, in which medical students are paired with pediatric patients suffering from chronic illness. The students offer their time and support to the children, helping to ease their time while in the hospital.”⁸⁶

6 Joining your school’s Pediatric Interest Group is an excellent way to learn more about the specialty. For information on how to establish or maintain a group at your school, a useful resource is the Pediatric Interest Group Resource.⁸⁷

7 Many osteopathic schools have pediatric student clubs. If your school doesn’t, the American College of Osteopathic Pediatricians has created a Student Chapter Manual with information on how to organize and run a club.⁸⁸

8 Although research in pediatrics isn’t required to secure a residency position, there are many benefits to research participation. The Department of Pediatrics at the Medical College of Georgia writes that summer research projects “add science to the art of medicine, build rapport with advisors and potential mentors, and enhance one’s competitiveness for matching in first choice residency programs after medical school. We believe that getting involved in research during the summer will enhance the quality of your work as a future pediatrician or other clinical practitioner.”⁸⁹ Most schools provide students with opportunities to perform pediatrics research during the summer between the first and second years.

9 The American Pediatric Society and the Society for Pediatric Research jointly sponsor the Student Research Program. There are currently research opportunities at over 300 institutions in the United State. A strong effort is made to link the student with the research group of his or her choice. Accepted students receive a stipend to support a two to three month experience. Of note, the experience takes place at an institution other than the student’s own medical school. For more information, visit <https://www.aps-spr.org>.

10 The American Academy of Pediatrics holds its National Conference in October. Several years ago, the Academy developed the Medical Student Subcommittee, which has worked on developing resources for medical students. Students interested in applying for a position should visit www.aap.org. The American College of Osteopathic Pediatricians holds its Spring Conference in April. Students may be able to present their research findings at these meetings, and network with physicians in the field.

Physical medicine and Rehabilitation: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Sarah Knievel is a fourth-year resident in the Department of Physical Medicine and Rehabilitation at the Mayo Clinic. For Sarah, “the decision to enter physical medicine and rehabilitation (PMR) was an easy one. PMR is a specialty that focuses primarily on the restoration of function. It is fascinating to work with complex patients with the intent to restore mobility, independence, and their ability to reach personal goals. Patient success ranges from resuming the activities of daily living to obtaining a personal record in a 10K race. I enjoy both the diagnostic and therapeutic aspects of my job that ultimately provide patients with tools to help themselves.”⁹⁰

Physical medicine and rehabilitation is a moderately competitive specialty. In the 2011 NRMP Match, approximately 370 positions were available. In 2010, there were a total of 1,228 residents training in 77 allopathic physical medicine and rehabilitation residency programs.²³ Fifty-five percent were U.S. MDs, 19.2% were IMGs, 25.7% were osteopathic graduates, and 0.1% were Canadian graduates. There are also three osteopathic residency programs offering positions through the AOA Match.

Exposure to physical medicine and rehabilitation during the preclinical years is often limited. To learn more about the specialty, the American Academy of Physical Medicine and Rehabilitation offers the following advice.⁹¹ “As a first or second year medical student, exploring PM&R as an option can be done through shadowing, contacting local residents and faculty, and through pursuing research on a relevant topic. There are some ‘externships’ in PM&R available to first year medical students during the summer between first and second year.”

1 Most students begin their exploration of the specialty by shadowing practicing physicians. Your dean's office may provide a list of faculty members who provide such experiences, or you may locate a physician through your school's interest group. You can also contact the PM&R department directly. In some cases, formal programs may be available. For example, the Department of Physical Medicine and Rehabilitation at the Indiana University School of Medicine offers a Summer Scholarship Program. This is a one-month experience in which students observe a faculty member in day-to-day activity.

2 The Department of Physical Medicine and Rehabilitation at Northwestern University sponsors the Rehabilitation Institute of Chicago Summer Externship Program. This program offers preclinical students the opportunity to assist in the clinical management of patients. Students are also able to participate in a research project.

3 Mentors are valuable resources, and can provide advice, guidance, and application support. In a survey of PM&R residents, only 35.4% of respondents reported having had a mentor before beginning residency training.⁹² However, among those who had a mentor, 75.9% indicated that their relationship with a mentor had a positive effect on their career decision. Some medical schools have created a list of faculty members who are interested in mentoring. If no such list exists, you can express your interest in the field and schedule a meeting with a faculty member in the department.

4 The American Academy of Physical Medicine and Rehabilitation has created a mentor program. Mentors are grouped according to their areas of interest in the field, and are available to answer questions about the specialty, residency programs, and the application process. Osteopathic students can also find a mentor through the American Osteopathic College of Physical Medicine and Rehabilitation's mentor program.

5 Opportunities to participate in PM&R research are available at many med schools, and students often take advantage of the summer following first year to participate in a focused research experience.

6 The Association of Academic Physiatrists (AAP) and the Foundation for PM&R offers students a summer externship (Rehabilitation Research Experience for Medical Students) following the first year of medical school at participating host institutions. During this externship, students are expected to complete a scholarly project. After completion of the project, students are expected to submit a research paper to the AAP Best Medical Student Paper Competition. Students are able to present their findings at the organization's Annual Assembly.

7 Students interested in research should also investigate the Medical Student Research Grant sponsored by the Education and Research Fund of the Foundation for Physical Medicine and Rehabilitation.

8 Interest groups provide a number of opportunities to explore the field in more depth. If your school does not have an active chapter, a guide to help you establish one is available at the website for the Association of Academic Physiatrists.⁹³

9 Osteopathic students may also learn more about the field through student chapters of the American Osteopathic College of Physical Medicine and Rehabilitation (AOCPMR), which have been established at many schools.

10 At the Annual Meeting of the Association of Academic Physiatrists, students may have opportunities to present their research, network with physicians in the field, and meet additional mentors. Opportunities to learn more about the specialty and network with those in the field are also available to students who attend the AOCPMR conference held in April. At the 2010 conference, students were given an overview of the field, tips to ace their PM&R clerkship, and insight into the application process from the perspective of program directors.

Plastic Surgery: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Trung Le is a plastic surgeon in private practice in Massachusetts. He was initially drawn to the specialty after being involved in the care of a woman who had breast cancer. “After the plastic surgeon performed breast reconstruction on her, you could see a big difference of how she viewed herself and her relationship with her husband. It was very inspiring,” recalls Dr. Le.⁹⁴

Plastic surgery is a highly competitive specialty. In the 2011 NRMP Match, approximately 100 positions were available for new graduates. In 2010, there were a total of 345 residents training in 71 allopathic plastic surgery residency programs.²³ Eighty-six percent were U.S. MDs, 11.9% were IMGs, 1.7% were osteopathic graduates, and 0.3% were Canadian graduates. There are also three osteopathic residency programs offering positions through the AOA Match.

At most schools, plastic surgery is not a required or core rotation. However, some third-year students are able to rotate through the field during their surgery core clerkship. If not, you'll have to wait until the beginning of your fourth year. However, there are considerable opportunities to explore the field as a preclinical student. In a survey of medical students, Dr. Greene, a faculty member in the Division of Plastic Surgery at the Harvard Medical School, found that “medical student exposure to plastic surgery is the most influential factor in a student’s decision to pursue a career in plastic surgery.”⁹⁵

1 Plastic surgeons are often active in the community. Students can witness the benefits they provide, and may be able to participate. Operation Smile offers medical mission opportunities to medical students. The organization is well-known for providing free cleft lip and palate repair surgery to children all over the world.

2 At the Annual Meeting of the American Society of Plastic Surgeons, which takes place in September, the Young Plastic Surgeons Forum holds its popular Medical Students Day. On this day, students can meet recognized leaders in the field, receive an overview of the residency training programs, learn about research opportunities, and attend a Q & A session with residents.

3 The American Society for Aesthetic Plastic Surgery invites medical students interested in plastic surgery as a career to attend The Aesthetic Meeting free of charge. At the scientific meeting, students are allowed to attend the Welcome Reception, visit exhibits, and interact with residents, fellows, and plastic surgeons. The meeting takes place in April or May.

4 Students interested in the field should explore the specialty further through shadowing. You can contact your dean's office or the plastic surgery department, and explain your interest in the field. Many faculty members are open to such requests, and some will have listed their interest with the dean's office.

5 Given the competitiveness of plastic surgery, locating a mentor and developing a relationship is important. By cultivating the relationship over time, your mentor will be able to write you a strong letter of recommendation when it comes time to apply for a residency position. In a survey of plastic surgery program directors, Dr. Jeffrey Janis, Program Director of the Plastic Surgery Residency at the University of Texas Southwestern Medical Center, found that high-

quality letters of recommendation, performance on subinternship rotations, and interview score were the three most important resident selection criteria.⁹⁶

6 “If a student is interested in plastic surgery, she or he should try and identify a mentor early,” write Dr. Jennifer Walden, Program Director of the Aesthetic Surgery Fellowship at the Manhattan Eye, Ear, and Throat Hospital, and Dr. Linda Phillips, Chief of the Division of Plastic Surgery and Senior Associate Dean for Faculty Affairs at UTMB.⁹⁷

7 At the “Becoming a Plastic Surgeon” blog, Dr. Charles Lee describes the benefits of a mentor relationship. “In medical school, you will be studying twice as hard, but should still find the time to identify a mentor, preferably at this time a plastic surgeon, with whom you can identify and begin some research projects. This will prepare you in multiple ways. It will allow you to see the process of residency training in plastic surgery, spend time with your role model to see what their professional career is like, and begin delving deeper into the science of plastic surgery. The mentor in this position will be critical in helping you obtain a spot in the most competitive residency in medicine.”⁹⁸

8 Opportunities to participate in plastic surgery research during the summer between your first and second years are available at some schools. Research leading to publication is highly valued in the plastic surgery residency selection process. In a survey of program directors, among the objective criteria used to evaluate applicants, publications in peer-reviewed journals ranked second in importance behind only membership in the Alpha Omega Alpha Honor Society.⁹⁹

9 Many students interested in the field will join their school’s Plastic Surgery Interest Group. Through lectures, community service projects, other experiences, and the opportunity to speak directly with plastic surgeons, students can gain a more extensive overview of the field. Unfortunately, many schools lack such a group. If so, you may consider starting your own chapter. A list of active and inactive groups is available at The American Society for Aesthetic Plastic Surgery website (www.surgery.org).

10 Note that leadership capabilities were considered the most important subjective criterion used by program directors to evaluate applicants during the residency interview.⁹⁹ The preclinical years are an excellent time to actively participate in student organizations and run for leadership positions.

Psychiatry: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Sarah Whitman, a psychiatrist in private practice in Pennsylvania, recalls how her initial interest in the specialty developed. “When I entered medical school, I really knew nothing about psychiatry. I had taken psychology courses in college, but didn’t know about psychiatry as a field. In the 3rd year of medical school, my psychiatry rotation was seeing patients who were on the medical units of the hospital about whom the staff had some psychiatric concerns or questions. For example, if someone had just been diagnosed with cancer and didn’t seem to handle that well. Or a patient was in the ICU and seemed to be out of it – what was going on. So these were people just like you and me who were having psychological problems while in the hospital. That intersection of psychiatry and medicine seemed really interesting to me. It also allowed me to continue to use my medical knowledge.”¹⁰⁰

Although psychiatry is not a competitive specialty, securing a position in a top tier residency program is difficult. In the 2011 NRMP Match, approximately 1,100 positions were available. In 2010, there were 4,865 residents training in a total of 182 allopathic psychiatry residency programs.²³ Fifty-seven percent were U.S. MDs, 33.2% were IMGs, 9.5% were osteopathic graduates, and 0.1% were Canadian graduates. There are also 12 osteopathic residency programs offering positions through the AOA match.

1 The most helpful way to begin learning about the specialty is to observe psychiatrists in practice. Psychiatrists are actively involved in the preclinical education of medical students through behavioral science and neuroscience courses, and you can ask these faculty members about shadowing opportunities. Opportunities may also be available through participation in your school’s Psychiatry Interest Group.

2 The Summer Medical Student Fellowship sponsored by the American Academy of Child and Adolescent Psychiatry allows students to explore the field, gain clinical or research experience, and meet leaders in the field by attending the AACAP Annual Meeting.

3 The American Psychiatric Association has a Minority Medical Student Summer Mentoring Program for minority students. In the program, students work closely with a psychiatry mentor in a research, academic, or clinical setting.

4 The American Psychiatric Association has a Minority Medical Student Summer Externship in Addiction Psychiatry. Through this one-month program, minority medical students are able to participate in a clinical shadowing experience in services related to substance abuse treatment. The AACAP also sponsors the Jeanne Spurlock Minority Medical Student Research Fellowship in Substance Abuse and Addiction. This is a summer opportunity for minority medical students to perform research in substance abuse as it relates to child and adolescent psychiatry. Participants are expected to present their research at the Annual Meeting.

5 The Department of Psychiatry at Indiana University sponsors the Psychiatry Summer Internship Program. This program provides students with an opportunity to learn about research and clinical care in the field. The time is split evenly between clinical care and research. According to the department, “the expectation is that all participants will complete a paper ready for submission to a psychiatric journal during the 6-week program.”¹⁰¹

6 Students benefit greatly when they receive advice and guidance from experienced psychiatry faculty. Mentors can also provide clinical and research opportunities, as well as advocate for students during the residency application process. Because psychiatrists at most schools are significantly involved in preclinical education, you may have opportunities to meet these physicians in small group sessions and lectures. Mentor relationships may be established through your school's psychiatry interest group. You can also introduce yourself to the psychiatry department, express your interest in the field, and ask for suggestions on possible advisors.

7 Dr. Angela Harper, a psychiatrist in private practice, was fortunate to have several wonderful mentors.¹⁰² "I worked with a female psychiatrist in private practice as a medical student who first made me think, 'I want to be like her when I grow up.'" However, the mentor that has most impacted her personally and professionally was her third-year psychiatry clerkship director. "He has seen me through it all – the 'match,' my first night of call in the emergency room (when I was scared to death), professional successes and failures, deciding on a fellowship, moonlighting anxiety, career decisions, and personal anxieties and triumphs."

8 Several national organizations have established mentor programs. The American Academy of Child and Adolescent Psychiatry (AACAP) has started a program for medical students interested in child and adolescent psychiatry. The American Association for Geriatric Psychiatry also makes geriatric psychiatrists available to students for mentoring.

9 In order to learn more about the field, you should join your school's Psychiatry Interest Group. Membership will allow you to interact with others who share your interest in the field, shadow psychiatrists, and identify mentors. Most U.S. medical schools have active groups. Resources to help you start or grow a group are available at the Psychiatry Student Interest Group Network.¹⁰³

10 The American Academy of Child and Adolescent Psychiatry has prepared materials to help students establish medical school groups to explore the field of child and adolescent psychiatry. The program is called the Special Interest Group Network (SIGN), and ideas for SIGN activities are available at www.aacap.org. The organization makes monetary grants (Medical Student – Psychiatry Special Interest Grant) available to those who wish to plan activities that would allow students to explore some aspect of the field.

Radiation Oncology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Arpi Thukral is a radiation oncologist in Chicago. Recently she was asked why she chose to pursue a career in radiation oncology. "I am attracted to this specialty because it is an intellectual and technically-driven discipline with the physician-patient relationship at its core. As a radiation oncologist, I have the privilege and opportunity to help and support cancer patients and their families through the challenging treatment journey they endure."¹⁰⁴

Radiation oncology is a highly competitive specialty. In the 2011 NRMP Match, approximately 170 positions were available. Fifteen percent of U.S. senior applicants failed to match. In 2010, there were 603 residents training in a total of 85 allopathic radiation oncology residency programs.²³ Ninety-six percent were U.S. MDs, 3.0% were IMGs, and 1.0% were osteopathic graduates.

Exposure to the specialty of radiation oncology is limited at many schools. Dr. Ariel Hirsch, Director of Education in the Department of Radiation Oncology at the Boston University Medical Center, wrote that "radiation oncology is a subject that is not widely taught in the mainstream undergraduate medical curriculum, nor is it well understood by medical students and physicians outside of the field. Although interest in radiation oncology has been increasing steadily over the past few years, it is generally only those medical students applying for radiation oncology residencies who rotate through specific radiation oncology electives. For the remainder of the medical student body, exposure to radiation oncology will be limited to none."¹⁰⁵

1 Radiation oncology is a very competitive residency, and many students first hear about it because it is one of the fields associated with a controllable lifestyle and one in which physicians have significant impact on seriously ill patients. Since preclinical exposure to the field is typically non-existent, students with an interest in learning more about the field should begin by shadowing a practicing radiation oncologist. You can begin by asking your dean's office, or by approaching one of the faculty members at your school.

2 Because you may have limited interaction with radiation oncology faculty until fourth year, your initiative will be key to establishing a relationship with a mentor early in your medical education. Introduce yourself to the radiation oncology department at your school. Take advantage of any opportunities to meet with the program director or chairman. Dr. Dennis Hallahan, Chairman of Radiation Oncology at Washington University in St. Louis, credits his mentors for stimulating his interest in the field. "While I was training at the University of Chicago, I met some brilliant mentors in radiation oncology and decided to train with them as opposed to going into medical oncology."¹⁰⁶

3 Some schools arrange career fairs or forums, and you may have an opportunity to meet faculty through these means. Performing research is yet another way to establish a relationship with a mentor.

4 Because radiation oncology is one of the most competitive specialties, students with an early interest in the field should seriously consider participation in research. Schools with academic radiation oncology departments often provide research opportunities for students following their first year.

5 Preclinical students are eligible to apply for the Simon Kramer Externship in Radiation Oncology. Through this program, students spend six weeks at an academic radiation oncology department working on a clinical research project and shadowing radiation oncologists.

6 Another program that provides early exposure to the specialty is the Ivan H. Smith Memorial Studentship (ISMS) program. In this program, students spend six to eight weeks shadowing oncologists and radiation oncologists in Canada. Although the emphasis of this experience is clinical, students are also encouraged to pursue a research project.

7 The American Society for Radiation Oncology offers the Minority Summer Fellowship Award to support medical students from underrepresented minority groups. Through this program, students are introduced to the discipline of radiation oncology early in their medical training. The experience allows students to receive “a unique training opportunity that focuses on mentoring and hands-on experience” in the field.¹⁰⁷

8 The Radiological Society of North America encourages students interested in radiological sciences to apply for their Research Medical Student Grant. At least ten weeks must be spent on a full time basis performing research in a department of radiology, radiation oncology, or nuclear medicine.

9 Joining your school’s Radiation Oncology Interest Group will provide opportunities to learn more about the specialty and meet faculty. However, many schools lack a group or have groups that have become inactive. If so, you can restart a group, or become the founder of a new group.

10 The Pediatric Oncology Education Program at St. Jude Children’s Research Hospital offers short-term training experience in clinical or laboratory research in a variety of disciplines, including radiation oncology.

Radiology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Alan Zuckerman is an interventional radiologist in Atlanta. He was drawn to the specialty because of the integral role radiology plays in patient care. "As a medical student, I was attracted to radiology because it seemed to me that many diagnoses and decisions were being made on the basis of patients' radiology exams. Treatment options became clear once the radiology results were in, so the radiology department was an important, almost powerful, place. I have not been disappointed by radiology as a career. The technology revolution that has brought us the Internet and e-mail also propels diagnostic imaging forward. Of course, this improves healthcare for the public, but it also makes radiology a consistently stimulating profession."¹⁰⁸

Diagnostic radiology is a moderately competitive specialty. In the 2011 NRMP Match, over 1,100 positions were available. In 2010, there were 4,531 residents training in a total of 187 allopathic diagnostic radiology residency programs.²³ Eighty-eight percent were U.S. MDs, 8.0% were IMGs, 3.9% were osteopathic graduates, and 0.2% were Canadian graduates. There are also fifteen osteopathic residency programs offering positions through the AOA Match.

According to Dr. Barton Branstetter, Associate Professor of Radiology at the University of Pittsburgh, "in most traditional medical school curricula, radiology is not formally introduced to students until their clinical rotations."¹⁰⁹ Although exposure to the specialty may be limited through your preclinical coursework, for students with an interest in the field, opportunities to explore the specialty are available during the basic science years.

1 Most students begin to learn more about the actual practice of radiology through observation. If your school has an Office of Career Development, you may be able to arrange a shadowing experience through this office, such as at Oklahoma State University College of Osteopathic Medicine. At some schools, students are asked to contact the department of radiology directly to arrange the experience. Another option is to join your medical school's radiology interest group. Many of these groups have established shadowing programs. For example, the Radiology Society at Northwestern University Feinberg School of Medicine has a shadowing program that links preclinical students with radiologists.

2 Mentoring relationships are valuable for a number of reasons, but will require initiative to establish, especially since you may have limited interaction with radiology faculty until the third or fourth year of medical school. Introduce yourself to the Radiology department at your school. In particular, take advantage of any opportunities to meet with the program director or chairman. You may also identify mentors through participation in your school's radiology interest group. Once established, the mentoring relationship may have significant impact, as the following student describes:¹¹⁰

My mentor permitted me to see every aspect of her job, including her clinical work, teaching, didactic lecturing, and research. I saw that there are differences in how clinical work is done. I also found her to be very generous of her time, as she never said no to anyone asking for her expertise or any opportunity to teach... Being with someone who is so diligent can be very inspirational and makes you want to work hard. It incites you to want to teach, be involved in research, and give something back as a mentor to someone else.

3 Although students can match into the specialty without research, such experience, particularly if it leads to publication, can significantly strengthen your chances. Note that some academic programs may be very research-oriented. At these programs, lack of research may eliminate you from further consideration.

4 Students with an early interest in the field should consider involvement in research. Dr. Judith Amorosa, a faculty member in the Department of Radiology at UMDNJ/Robert Wood Johnson, offers a strong argument for performing research early in medical school. She writes that “starting a research elective near the end of the third year of medical school can be challenging. If there is adequate infrastructure and close mentoring, it is possible to accomplish a project that may even be submitted to a national meeting and eventually be published.”¹¹¹ Schools with academic radiology departments often provide students with opportunities to perform research during the summer following first year.

5 The Radiologic Society of North America sponsors the Research Medical Student Grant, which provides support for a research project. Applicants must be students at an accredited North American medical school, and perform research for a minimum of 10 weeks.

6 The Mallinckrodt Institute of Radiology at Washington University in St. Louis offers the Radiology Summer Research Program to medical students.

7 The Department of Radiology at the University of Cincinnati College of Medicine has set aside funds for medical students interested in performing clinical and/or translational research in the radiologic sciences.

8 The Society for Interventional Radiology has created the Student Research Grant to provide funding for a summer research project in an area important to the advancement of interventional radiology.

9 The Penn Interventional Radiology Department offers the Summer Scholars Program for students between their first and second years of med school. Through this experience, students carry out a clinical research project. An abstract is prepared and submitted to the Society of Interventional Radiology meeting. If accepted, students may have an opportunity to present their research at the meeting. The work of many students has culminated in the publication of a manuscript.

10 Many schools have established radiology student interest groups, and you can learn more about the specialty through involvement. If your school doesn't have a group, you may choose to start one. An excellent resource to help you create a new group or enhance an existing one was recently published in the journal *Academic Radiology*.¹¹²

General Surgery: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Michael Awad is a faculty member in the Department of Surgery at Washington University in St. Louis. As a medical student, he was unsure of his specialty choice entering clerkships. “I was undecided going into my third year of medical school at Brown University, so I kept my options open. I enjoyed both my pediatrics rotation and internal medicine rotation --but after my surgical rotation, I knew I had found my specialty. I appreciated the ability to have a direct and immediate impact on the course of someone’s condition or disease. I had great mentors in surgery that showed me the art of the field. They loved their work and at the same time were caring and communicative people. This is what sent me down the path of general surgery.”¹¹³

General surgery is a highly competitive specialty. In the 2011 NRMP Match, over 1,100 positions were available. However, 20% of U.S. senior medical school applicants failed to match. In 2010, there were 7,671 residents training in a total of 247 allopathic general surgery residency programs.²³ Seventy-nine percent were U.S. MDs, 17.8% were IMGs, 2.7% were osteopathic graduates, and 0.1% were Canadian graduates. There are also over 40 osteopathic residency programs offering positions through the AOA Match.

In a survey of over 900 students at 15 U.S. medical schools, surgery was the second most common specialty choice among first year students.¹ According to Dr. Riboh, a faculty member in the Department of Surgery at Stanford University, there is “no shortage of highly motivated preclinical medical students searching for opportunities in surgery.”¹¹⁴

1 Despite significant early interest in the field, preclinical students often report difficulty exploring the specialty because of limited exposure to surgeons. However, “many hospitals and departments of surgery have allowed MS-1 and MS-2 students who are on summer rotations the opportunity of working in operating rooms, research laboratories, and other employment in the surgical work environment” writes Dr. Kirby Bland, Chairman of the Department of Surgery at the University of Alabama – Birmingham School of Medicine.¹¹⁵

2 If you're interested in surgery, you should take the initiative and arrange to shadow a surgeon. Shadowing opportunities aren't typically publicized, and it's up to each individual student to contact faculty members directly. You can start with your dean's office, as many maintain lists of faculty members open to medical student observers. You may also contact the department of surgery, and ask which faculty members you should approach about shadowing.

3 Because you may have limited interaction with surgery faculty until third or fourth year, you'll have to be pro-active if you wish to identify and work with a mentor early in your medical education. You can begin by introducing yourself to the surgery department at your school. In particular, take advantage of any opportunities to meet with the program director and chairman, as these individuals are fully involved in the residency selection process and can provide valuable guidance.

4 You may also identify mentors by joining your school’s surgery interest group. The University of Texas Medical School at San Antonio has established its Longitudinal Surgical Mentorship Program to link new students with surgical mentors from Day 1 of medical school. Once established, the mentoring relationship may have a profound effect, as Dr. Elizabeth Stephens

writes in a tribute to her mentor, Dr. Charles Fraser, Chief of the Texas Children's Hospital Cardiac Surgery Department:¹¹⁶

It was a clear, cool fall morning of my first year in medical school. I had remembered that we were scheduled to have a special guest for our 8 AM lecture that morning, but little did I know how much that lecture would change my life...As I approached Dr. Fraser at the conclusion of his lecture, I did not even know what to ask. All I knew was that I had been fascinated by what I saw and wanted to know more. Dr. Fraser, in his gentle, encouraging way, offered to meet with me to answer my questions...What struck me most about meeting with him was how generous he was with his time and his genuine interest in me and my career aspirations...He was also genuinely interested in me and my goals and was interested in supporting me regardless of my ultimate decision.

5 Your school's Surgery Interest Group can provide a number of opportunities to learn more about the field. The Surgical Society at the University of Colorado School of Medicine offers this advice. "You should take advantage of every opportunity to expose yourself to that field. For surgery, you should take advantage of the Surgical Society's Preceptor for a Day and Night On-Call with a Resident Programs, monthly lectures, suture clinics, laparoscopic workshops, surgical instruments workshops, and faculty-student receptions."¹¹⁷

6 Opportunities to perform research following first year are available at U.S. medical schools. Research may also be arranged through national organizations. The American Society of Colon and Rectal Surgeons offers the Medical Student Research Initiation Grant to medical students interested in performing clinical or laboratory-based research on diseases affecting the colon, rectum, and anus. Preclinical students may participate in the Summer Intern Scholarship Program established by the American Association for Thoracic Surgery. This program introduces students to cardiothoracic surgery. Medical students interested in vascular surgery may apply for the William J. von Liebig Summer Research Fellowship at Harvard Medical School.

7 Pablo Guzman, a medical student at the University of California San Francisco, arranged a four-week surgical rotation in Colombia following his first year of medical school. His goal was to combine his interest in surgery with his desire "to participate in international volunteer activities."¹¹⁸ To arrange the experience, Pablo first visited the Office of International Programs where he was referred to a Colombia-trained pediatrician currently training as a pediatric critical care fellow at UCSF. The fellow was able to put him into contact with a colleague in Colombia, and, through her assistance, Pablo was able to organize a summer surgery internship abroad.

8 The Division of Thoracic Surgery at Massachusetts General Hospital has a Thoracic Surgery Summer Scholars Program in which preclinical students are able to spend the summer with thoracic surgeons rounding, taking care of patients, and observing in the operating room. Opportunities to perform a clinical research project are also available.

9 The Association of Women Surgeons encourages female medical students to participate in the Medical Student and Resident Poster Competition. This event is held annually, and selected students are able to present their research at the AWS meeting.

10 Medical students interested in a surgical volunteer experience can search through a database of opportunities at the Operation Giving Back website.¹¹⁹ Operation Giving Back is a program of the American College of Surgeons. The database can be searched based on geographic location and specialty. Through Operation Smile, medical students interested in reconstructive surgery can observe operations in 25 different countries. The Cinterandes Foundation, based in Ecuador, provides free surgical services to patients in rural areas. Through their “Mobile Surgery” program, patients living in rural areas without access to surgery can undergo operations in a mobile operating room housed in a van. The Foundation has teaching programs for medical students which are typically 8 weeks in length.

Urology: 10 Ways to Explore the Specialty as a Preclinical Student

Dr. Karen Boyle is a urologist specializing in male infertility. Entering medical school at Albany Medical College, she anticipated pursuing a career in pediatric oncology. “But a urology rotation in my third year made me change course. I had an amazing mentor who later became their dean. He helped me appreciate the diversity of the surgeries one performs as a urologist. In urology you can develop a long-term bond with patients because you treat them both medically and surgically. I also enjoyed the technology, like minimally invasive surgery, and the diverse patient population.”¹²⁰

Urology is a highly competitive specialty. In the 2012 Match, there were 278 available positions. Twenty-three percent of U.S. senior medical students failed to match. In 2010, there were 1,069 residents training in a total of 122 allopathic urology residency programs.²³ Ninety-five percent were U.S. MDs, 3.9% were IMGs, 0.7% were osteopathic graduates, and 0.1% were Canadian graduates. There are also nine osteopathic residency programs offering positions through the AOA Match.

At most schools, urology is not a required or core rotation. However, some third year students are able to rotate through the field during the surgery core clerkship. According to Dr. Anurag Das, Assistant Professor of Urology at Harvard Medical School, “for many students, their initial exposure to urology is on their third-year rotations in surgery. Unfortunately, at many institutions, most students are never exposed to urology and never get a chance to consider it as a career choice.”¹²¹

1 Given the competitiveness of urology, finding a mentor early in medical school is important. Dr. Martha Terris, a faculty member in the Department of Urology at the Medical College of Georgia, writes that preclinical students “should identify members of the urology faculty at their medical school who are willing to review their curriculum vitae and offer specific advice regarding enhancing their application.”¹²²

2 Establishing a relationship with a mentor may require significant initiative on your part, since contact with urology faculty may be limited during the preclinical years. In a survey of medical school urology departments, Dr. Loughlin, a faculty member in the Division of Urology at the Harvard Medical School, found that students at many schools did not have exposure to urologists during the preclinical years.¹²³ Thirty-two percent of schools had no urology faculty lectures and 50% had no urology lecture in the physical diagnosis course. Sixty-five percent of respondents reported that it was possible to complete medical school without any clinical exposure to the field.

3 If you're interested in the field, you have to learn what the daily practice of urology entails. Check with your school for a list of urology faculty members who are able to provide shadowing experiences. Shadowing can also be arranged by contacting your school's urology department. If there's a urology interest group at your school, you may be able to identify a faculty member to shadow through the group.

4 You may be able to identify mentors through national organizations. For example, the Society of Women in Urology has a Mentor Program. To be eligible for the program, you must become a member of the society. For more information, visit www.swiu.org.

5 Role models were one of the most important factors that led Dr. Cathy Naughton, Assistant Professor in the Department of Urology at the Washington University School of Medicine, to pursue urology as a career. “It takes one person to spark your interest in something. Mentorship is key.”¹²⁴ According to Dr. Peter Schlegel, Chairman of the Department of Urology at the Weill Medical College of Cornell University, students should “learn as much about the field from residents, other students who have applied for residency positions, and local faculty members.”¹²⁴

6 Urologists are active in the community, and students may have opportunities to take part. For example, students in the Urologic Society at the Jefferson Medical College participate in the Prostate Cancer Run to raise money and awareness for prostate cancer. Recently, the group began the Testicular Disease Awareness Initiative. Through this program, students will visit Philadelphia high schools to educate students on testicular health, including the importance of self-examinations.

7 According to Dr. Roger Low, Program Director of the University of California Medical School at Davis, “research is highly desirable; most invited for interview are involved in research or have involvement in past publications.”¹²⁵ Therefore, if you have an interest in urology, an ideal time to perform research in the field is the summer between the first and second years of med school.

8 Opportunities to participate in urology research during the summer following first year are often available at schools with academic urology departments. The American Urological Association Foundation offers the Herbert Brendler, MD Summer Medical Student Fellowship Program to students interested in performing urologic research. The Sexual Medicine Society of North America also offers funding through the Sexuality Research Grants Program.

9 Students attending medical school in the greater New York area (including New Jersey) may be eligible to receive funding through the Ferdinand C. Valentine Medical Student Research Grant in Urology. Participants are expected to present their research at the New York Academy of Medicine’s annual Medical Student Forum.

10 You must develop relationships with faculty members to match into the field. Early development of these connections can help. By cultivating the relationship over time, your mentor will be able to write you a strong letter of recommendation when it comes time to apply for a residency position. At least two letters written by urology faculty are recommended by most residency programs.

References

- ¹Compton M, Frank E, Elon L, Carrera J. Changes in U.S. medical students' specialty interests over the course of medical school. *J Gen Intern Med* 2008; 23(7): 1095-1100.
- ²Manuel R, Borges N, Jones B. Person-oriented versus technique-oriented specialties: early preferences and eventual choice. *Med Educ Online* 2009; 14: 4.
- ³Medical College of Wisconsin Alumni News: Alumni reflect on medical school courses that influenced them most. <http://www.mcw.edu/display/docid23758.htm>. Accessed January 24, 2012.
- ⁴Society for Education in Anesthesia Medical Student Guide to Anesthesiology. <http://www.studentorg.vcu.edu/soaig/SEAMedicalStudentGuide2009.pdf>. Accessed January 24, 2012.
- ⁵Hearst N, Shore W, Hudes E, French L. Family practice bashing as perceived by students at a university medical center. *Fam Med* 1995; 27(6): 366-70.
- ⁶Hunt D, Scott C, Zhong S, Goldstein E. Frequency and effect of negative comments ("badmouthing") on medical students' career choices. *Acad Med* 1996; 71(6): 665-9.
- ⁷Campos-Outclat D, Senf J, Kutob R. Comments heard by US medical students about family practice. *Fam Med* 2003; 35(8): 573-8.
- ⁸Katz L, Sarnacki R, Schimpfhauser F. The role of negative factors in changes in career selection by medical students. *J Med Educ* 1984; 59(4): 285-90.
- ⁹Holmes D, Turniel-Berhalter L, Zayas L, Watkins R. "Bashing" of medical specialties: students' experiences and recommendations. *Fam Med* 2008; 40(6): 400-6.
- ¹⁰2010 AAMC Medical School Graduation Questionnaire. Available at: www.aamc.org. Accessed August 13, 2011.
- ¹¹Kassebaum D, Szenas P. Medical students' career indecision and specialty rejection: roads not taken. *Acad Med* 1995; 70(10): 937-43.
- ¹²Medscape "How should I choose a medical specialty. Available at: <http://www.medscape.com/viewarticle/544574>. Accessed January 24, 2012.
- ¹³Association of American Medical Colleges (AAMC) Website. <http://www.aamc.org/students/cim/about.htm>. Accessed September 23, 2011.
- ¹⁴University of Virginia School of Medicine Medical Specialty Aptitude Test. Available at: <http://www.med-ed.virginia.edu/specialties>. Accessed January 24, 2012.
- ¹⁵Aagaard E, Hauer K. A cross-sectional descriptive study of mentoring relationships formed by medical students. *J Gen Intern Med* 2003; 18(4): 298-302.
- ¹⁶From Revolutionhealth. Interview with "Hopkins" ABC TV Real Life Doctor – Dr. Q. Available at: <http://www.revolutionhealth.com/blogs/bradlyjacobsmdmph/interview-with-hopki-14503>. Accessed January 24, 2012.
- ¹⁷Weinstein P, Gipple C. Some determinants of career choice in the second year of medical school. *J Med Educ* 1975; 50(2): 194-8.
- ¹⁸AAMC Choices Newsletter August 2010. Available at: https://www.aamc.org/students/medstudents/cim/choicesnewsletter/august10/263054/ask_the_advisor_switching_specialties.html. Accessed January 24, 2012.
- ¹⁹Cardiothoracic Surgery Network "Why become a chest surgeon?" Available at: <http://www.ctsnet.org/sections/residents/newhorizons/article-3.html>. Accessed January 24, 2012.

- ²⁰Schwartz R, Jarecky R, Strodel W, et al. Controllable lifestyle: a new factor in career choice by medical students. *Acad Med* 1989; 64: 606-609.
- ²¹Dorsay E, Jarjoura D, Rutecki G. Influence of controllable lifestyle on recent trends in specialty choice by US medical students. *JAMA* 2003; 290(9): 1173-8.
- ²²New York Times. Call it a reversible coma, not sleep. Available at <http://www.nytimes.com/2011/03/01/science/01conv.html>. Accessed January 24, 2012.
- ²³Brotherton S, Etzel S. Graduate medical education, 2010-2011. *JAMA* 2011; 306(9): 1015-30.
- ²⁴Lin S, Strom S, Canales C, Rodriguez A, Kain Z. The impact of the anesthesiology clerkship structure on medical students matched to anesthesiology. Abstract presented at the 2010 Annual Meeting of the American Society Anesthesiologists. A1106.
- ²⁵AMA Residency programs: an inside look. Available at: <http://www.ama-assn.org/ama/pub/about-ama/our-people/member-groups-sections/minority-affairs-consortium/transitioning-residency/residency-programs-an-inside-look.page>. Accessed January 24, 2012.
- ²⁶Premed Network Q & A with Dr. Jessica Barnes. Available at: <http://www.premednetwork.com/forum/topics/q-and-a-with-dr-jessica-barnes>. Accessed January 24, 2012.
- ²⁷Barnett S, Mitchell J, Jones S. Is it time to unmask anesthesia in the medical school curriculum? Abstract presented at the 2009 Annual Meeting of the American Society Anesthesiologists. A1523.
- ²⁸Ohio State University Department of Anesthesiology. Available at: <http://anesthesiology.osu.edu/11430.cfm>. Accessed January 24, 2012.
- ²⁹DrSkinLaser website. Available at: <http://www.doctorskinlaser.com/about/biography>. Accessed January 24, 2012.
- ³⁰Wagner R, Ioffe B. Medical student dermatology research in the United States. *Dermatol Online J* 2005; 11(1): 8.
- ³¹Alikhan A, Sivamani R, Mutizwa M, Aldabagh B. Advice for medical students interested in dermatology: perspectives from fourth year students who matched. *Dermatol Online J* 2009; 15(7): 4.
- ³²Women's Dermatologic Society. Available at: <http://www.womensderm.org/>. Accessed February 9, 2012.
- ³³American Academy of Dermatology. Available at: <http://www.aad.org/member-tools-and-benefits/residents-and-fellows/diversity-mentorship-program-information-for-medical-students>. Accessed January 24, 2012.
- ³⁴Ohio State University College of Medicine Emergency Medicine Interest Group. Available at: <http://emig.org.ohio-state.edu/faq>. Accessed January 25, 2012.
- ³⁵Lotfipour S, Luu R, Hayden S, Vaca F, Hoonpongsimanont W, Langdorf M. Becoming an emergency medicine resident: a practical guide for medical students. *J Emerg Med* 2008; 35(3): 339-44.
- ³⁶Garmel G. Mentoring medical students in academic emergency medicine. *Acad Emerg Med* 2004; 11(12): 1351-7.
- ³⁷Penciner R. Emergency medicine preclerkship observerships: evaluation of a structured experience. *CJEM* 2009; 11(3): 235-9.
- ³⁸The Successful Match: Getting into Emergency Medicine. Available at: <http://studentdoctor.net/2010/08/the-successful-match-getting-into-emergency-medicine/>. Accessed January 25, 2012.

- ³⁹Emergency Medicine Residents' Association. Available at: <http://www.emra.org/>. Accessed January 25, 2012.
- ⁴⁰The Health Journal. "Cynthia Romero, MD: Making Patient Care a Family Affair. Available at: <http://www.thehealthjournals.com/archive.php?id=252>. Accessed January 25, 2012.
- ⁴¹Virtual Family Medicine Interest Group website. Available at: <http://fmignet.aafp.org/online/fmig/index.html>. Accessed January 25, 2012.
- ⁴²The Future of Primary Care. Available at: <http://emc.org/body.cfm?id=41&category=6&subcategory=23&action=detail&ref=1626>. Accessed January 26, 2012.
- ⁴³ACP-ASIM Observer. Available at: <http://www.acpinternist.org/archives/2000/11/namechange.html>. Accessed January 25, 2012.
- ⁴⁴ACP Mentoring Database. Available at: <http://www.acponline.org/residents+fellows/mentors/>. Accessed January 25, 2012.
- ⁴⁵Ohio State University Department of Medicine. Available at: <http://internalmedicine.osu.edu/education/students/summerresearch/>. Accessed January 25, 2012.
- ⁴⁶Uniformed University of the Health Sciences Internal Medicine Interest Group. Available at: <http://www.usuhs.mil/imig/imigopportunities.html>. Accessed January 25, 2012.
- ⁴⁷Virginia Commonwealth School of Medicine "Exploring Career Options in Medicine." Available at: <http://www.medschool.vcu.edu/studentaffairs.counseling/documents/careers.pdf>. Accessed January 25, 2012.
- ⁴⁸University of Iowa Medicine Alumni Society. Available at: http://www.healthcare.uiowa.edu/alumni/interviews/richerson_george.html. Accessed January 25, 2012.
- ⁴⁹Student Interest Group in Neurology Reference Manual. Available at: <http://www.aan.com/globals/axon/assets/7999.pdf>. Accessed January 25, 2012.
- ⁵⁰American Academy of Neurology. Available at: <http://www.aan.com>. Accessed January 23, 2012.
- ⁵¹Women In Neurosurgery "So, You Want to be a Neurosurgeon." Available at: <http://www.neurosurgerywins.org/career/SYWTBANS.pdf>. Accessed January 25, 2012.
- ⁵²Fox B, Hassan A, Patel A, Fulkerson D, Suki D, Jea A, Sawaya R. Neurosurgical rotations or clerkships in US medical schools. *J Neurosurg* 2011; 114(1): 27-33.
- ⁵³NYU Department of Neurosurgery. Available at: <http://www.med.nyu.edu/neurosurgery/education/students/summer.html>. Accessed January 25, 2012.
- ⁵⁴Medical College of Georgia. Available at: <http://www.mcghealth.org>. Accessed July 12, 2011.
- ⁵⁵Pauletta and Denzel Washington Family Gifted Scholars Program in Neuroscience. Available at: <http://www.cedars-sinai.edu/Patients/Programs-and-Services/Neurosurgery/Washington-Family-Scholars-Program.aspx>. Accessed January 25, 2012.
- ⁵⁶Scott and White Healthcare. Q & A with Dr. Mark Rowe. Available at: <http://www.sw.org/women-health/obgyn-waco/qa-rowe>. Accessed January 26, 2012
- ⁵⁷Bienstock J, Laube D. The recruitment phoenix: strategies for attracting medical students into obstetrics and gynecology. *Obstet Gynecol* 2005; 105: 1125-7.
- ⁵⁸Schnatz P, Humphrey K. Reasons and principles for starting an obstetrics and gynecology scholars group. *Obstet Gynecol* 2008; 111(4): 953-8.

- ⁵⁹The Successful Match: Getting into Obstetrics and Gynecology Available at: <http://studentdoctor.net/2010/05/the-successful-match-getting-into-obstetrics-and-gynecology/>. Accessed January 26, 2012.
- ⁶⁰Research Programs Open to Jefferson Medical College Students. Available at: <http://jeffline.tju.edu/Researchers/StudentResearch/jmc.html> Accessed January 26, 2012.
- ⁶¹Pacific Eye. Available at: <http://www.paceyemd.com/optometrist/abroms.cfm>. Accessed January 26, 2012.
- ⁶²Association of University Professors in Ophthalmology 2004 Survey on Medical Student Teaching. Available at: <http://www.aupo.org>.
- ⁶³The Successful Match: Getting into Ophthalmology. Available at: <http://studentdoctor.net/2009/08/the-successful-match-interview-with-dr-andrew-lee-ophthalmology/>. Accessed January 26, 2012.
- ⁶⁴Methodist Sports Medicine. Available at: http://www.methodistsports.com/physicians/stephen_ritter/index.html. Accessed January 26, 2012.
- ⁶⁵Bernstein J, DiCaprio M, Mehta S. The relationship between required medical school instruction in musculoskeletal medicine and application rates to orthopedic surgery residency programs. *J Bone Joint Surg* 2004; 86: 2335-8.
- ⁶⁶Stern P, Riley L, Johnson D, Boyer M. Educational opportunities for medical students and young orthopedic surgeons. *J Bone Joint Surg* 2003; 85: 573-5.
- ⁶⁷Reilly C, Stothers K, Broudo M, Perdios A, Tredwell S. An orthopedic career fair: a novel recruitment event. *Can J Surg* 2007; 50(3): 168-70.
- ⁶⁸Wake Forest University Department of Orthopedic Surgery. Available at: <http://www.wakehealth.edu/School/Orthopaedic-Surgery/Tips-for-Medical-Students-Year-1-3.htm>. Accessed January 26, 2012.
- ⁶⁹UC Irvine Career Guidance Handbook: Orthopedic Surgery. Available at: <http://www.meded.uci.edu/education/residencyselection/orthosurgery.html>. Accessed January 26, 2012.
- ⁷⁰Children's Hospital of Philadelphia Research Institute. Available at: <http://stokes.chop.edu/programs/ortho/opportunities.php>. Accessed February 9, 2012.
- ⁷¹St. Joseph's Candler. Available at: <http://www.sjchs.org/drdaavidoliver>. Accessed January 26, 2012.
- ⁷²Haddad J, Shah J, Takoudes R. A survey of US medical education in otolaryngology. *Arch Otolaryngol Head Neck Surg* 2003; 129: 1166-9.
- ⁷³Drexel University College of Medicine Career Development Center. Available at: <http://webcampus.drexelmed.edu/cdc/medSpecialtyOtolaryngology.asp>. Accessed January 26, 2012.
- ⁷⁴University of Virginia School of Medicine Student Handbook. Available at: <http://www.med-ed.virginia.edu/handbook/orgs/clubService.cfm>. Accessed on January 26, 2012.
- ⁷⁵University of Rochester Medical Center. Available at: <http://www.urmc.rochester.edu/news/story/index.cfm?id=1966>. Accessed January 26, 2012.
- ⁷⁶Johns Hopkins Pathology. Available at: <http://apps.pathology.jhu.edu/blogs/pathology/why-i-became-a-pathologist>. Accessed January 28, 2012.

- ⁷⁷Holland L, Bosch B. Medical students' perceptions of pathology and the effect of the second-year pathology course. *Hum Pathol* 2006; 37(1): 1-8.
- ⁷⁸Hung T, Jarvis-Selinger S, Ford J. Residency choices by graduating medical students: why not pathology? *Hum Pathol* 2011; 42(6): 802-7.
- ⁷⁹University of Massachusetts Department of Pathology. Available at: http://www.umassmed.edu/pathology/first_and_second_year_teaching/index.aspx#observerships Accessed January 28, 2012.
- ⁸⁰University of Chicago Pritzker School of Medicine Residency Process Guide 2011. Available at: pritzker.uchicago.edu/current/students/ResidencyProcessGuide.pdf Accessed January 28, 2012.
- ⁸¹American Society of Investigative Pathology. Available at: www.asip.org/pubs/pathways/Sept2008.pdf . Accessed July 23, 2011.
- ⁸²Where. What. When. Community Spotlight. Available at: <http://www.wherewhatwhen.com/archive/2006/08/community-spotlight/>. Accessed January 29, 2012.
- ⁸³Texas Pediatric Society General Pediatric Preceptorship Program. Available at: www.txpeds.org. Accessed January 29, 2012.
- ⁸⁴White C, Waller J, Freed G, Levine D, Moore R, Sharkey A, Greenberg L. The state of undergraduate pediatric medical education in North America: The COMSEP survey. *Teach Learn Med* 2007; 19(3): 264-70.
- ⁸⁵American Academy of Pediatrics. Available at: http://www2.aap.org/sections/ypn/ms/getting_involved/PIG.html. Accessed January 29, 2012.
- ⁸⁶Georgetown University Medical Center. Available at: <http://gumc.georgetown.edu/news/75433.html>. Accessed January 29, 2012.
- ⁸⁷Pediatric Interest Group Resource. Available at: http://www.aap.org/sections/ypn/ms/getting_involved/PIGResourceGuide.pdf. Accessed January 29, 2012.
- ⁸⁸American College of Osteopathic Pediatricians Student Chapter Manual. Available at: <http://www.acopedes.org/students/clubs.iphtml>. Accessed January 29, 2012.
- ⁸⁹Medical College of Georgia Department of Pediatrics. Available at: <http://www.mcg.edu/pediatrics/scholars.html>. Accessed January 29, 2012.
- ⁹⁰Mayo Clinic. Available at: <http://www.mayo.edu/msgme/profiles-knievel.html>. Accessed January 29, 2012.
- ⁹¹American Academy of Physical Medicine and Rehabilitation. Available at: <http://www.aapmr.org/medstu/medstudi.htm>. Accessed January 29, 2012.
- ⁹²Galicia A, Klima R, Date E. Mentorship in physical medicine and rehabilitation residencies. *Am J Phys Med Rehab* 1997; 76(4): 268-75.
- ⁹³Association of Academic Physiatrists. Available at: <http://www.physiatry.org>. Accessed January 29, 2012.
- ⁹⁴Reliant Medical Group. Available at: <http://www.reliantmedicalgroup.org/meet-the-doctor/le-trung>. Accessed January 29, 2012.
- ⁹⁵Greene A, May J. Applying to plastic surgery residency: factors associated with medical student career choice. *Plast Reconstr Surg* 2008; 121(3): 1049-53.
- ⁹⁶Janis J, Hatef D. Resident selection protocols in plastic surgery: a national survey of plastic surgery program directors. *Plast Reconstr Surg* 2008; 122(6): 1929-39.

- ⁹⁷ Association of Women Surgeons. Available at: <http://www.womensurgeons.org/CDR/PlasticSurgery.asp>. Accessed January 29, 2012.
- ⁹⁸ Becoming a Plastic Surgeon Blog. Available at: <http://www.becomeplasticsurgeon.blogspot.com/>. Accessed January 29, 2012.
- ⁹⁹ LaGrasso J, Kennedy D, Hoehn J, Ashruf S, Przybyla A. Selection criteria for the integrated model of plastic surgery residency. *Plast Reconstr Surg* 121(3): 121e-125e.
- ¹⁰⁰ Super Scholar. Available at: <http://www.superscholar.org/interviews/sarah-whitman/>. Accessed January 29, 2012.
- ¹⁰¹ Indiana University Department of Psychiatry. Available at: <http://medicine.iu.edu/research/student-research-opportunities/>. Accessed June 22, 2011.
- ¹⁰² Harper A. Residents' forum: the making of a psychiatrist. *Psychiatric News* 2004; 39(9): 62.
- ¹⁰³ Psychiatry Student Interest Group Network. Available at: <http://www.psychsign.org/>. Accessed January 29, 2012.
- ¹⁰⁴ Chicago Area Cancer Care Radiation Oncologists. Available at: http://www.chicagocancer.org/ourteam_19.htm. Accessed January 29, 2012.
- ¹⁰⁵ Hirsch A, Singh D, Ozonoff A, Slanetz P. Educating medical students about radiation oncology: initial results of the oncology education initiative. *J Am Coll Radiol* 2007; 4(10): 711-5.
- ¹⁰⁶ Washington University School of Medicine. Available at: <http://wuphysicians.wustl.edu/page.aspx?pageID=1065>. Accessed January 29, 2012.
- ¹⁰⁷ American Society for Radiation Oncology Minority Summer Fellowship Award. Available at: <https://www.astro.org/Research/Funding-Opportunities/ASTRO-Supported-Grants/Minority-Summer-Fellowship/Index.aspx>. Accessed January 29, 2012.
- ¹⁰⁸ Atlanta magazine July 2007 Vol. 47, No. 3 published by Emmis Communications.
- ¹⁰⁹ Branstetter B, Faix L, Humphrey A, Schumann J. Preclinical medical student training in radiology: the effect of early exposure. *AJR* 2007; 188: W9-W14.
- ¹¹⁰ Sonners A. Value of a radiology research rotation: a medical student's perspective. *Acad Radiol* 2002; 9(7): 805-7.
- ¹¹¹ Amorosa J. Medical student education: how do I mentor medical students interested in radiology? *Acad Radiol* 2004; 11(1): 91-5.
- ¹¹² Fricke B, Gunderman R. Creating and enhancing radiology student interest groups. *Acad Radiol* 2010; 17 (12): 1567-9.
- ¹¹³ Washington University School of Medicine. Available at: <http://wuphysicians.wustl.edu/page.aspx?pageID=1168>. Accessed January 29, 2012.
- ¹¹⁴ Riboh J, Curet M, Krummel T. Innovative introduction to surgery in the preclinical years. *Am J Surg* 2007; 194(2): 227-30.
- ¹¹⁵ Bland K. The recruitment of medical students to careers in general surgery: emphasis on the first and second years of medical education. *Surgery* 2003; 134: 409-13.
- ¹¹⁶ The Cardiothoracic Surgery Network. Available at: <http://www.ctsnet.org/sections/residents/newhorizons/article-26.html>. Accessed January 29, 2012.
- ¹¹⁷ University of Colorado School of Medicine Surgical Society. Available at: <http://www.ucdenver.edu/academics/colleges/medicalschoo/education/studentaffairs/studentgroups/SurgicalSociety/Pages/FAQ.aspx>. Accessed January 29, 2012.
- ¹¹⁸ Guzman P, Schecter W. Global health opportunities in surgery: a guide for medical students and faculty. *J Surg Educ* 2008; 65(5): 384-7.

¹¹⁹Operation Giving Back. Available at: <http://www.operationgivingback.facs.org/>. Accessed January 29, 2012.

¹²⁰Johns Hopkins Medicine Dome. Available at: <http://www.hopkinsmedicine.org/dome/0702/feature3.cfm>. Accessed January 29, 2012.

¹²¹American College of Surgeons. Available at: <http://www.facs.org/residencysearch/specialties/urology.html>. Accessed January 29, 2012.

¹²²Association of Women Surgeons. Available at: <http://www.womensurgeons.org/CDR/Urology.asp>. Accessed February 9, 2012.

¹²³Loughlin K. The current status of medical student urological education in the United States. *J Urol* 2008; 179(3): 1087-90.

¹²⁴Bellask J. Specialty spotlight: urology. *Journal of Andrology* 2005; 26(6): 673-4.

¹²⁵University of California Davis Department of Urology. Available at: http://www.ucdmc.ucdavis.edu/urology/education/residency_program/. Accessed January 29, 2012.