

PREPARING FOR MEDICAL SCHOOL: A GUIDE FOR FRESHMEN AND SOPHOMORES

2017-2018

HEALTH PROFESSIONS AND PRELAW CENTER

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GOOD BEGINNINGS

The Health Professions and Prelaw Center (HPPLC) advises students--freshmen through graduate students--who are preparing for medical school. Admission is highly competitive, and it is important for you to have correct and current information. In addition to reading this guide, please read all information on the HPPLC website (www.hpplc.indiana.edu) related to careers in medicine and healthcare, the application process, and obtaining letters of recommendation. Please make sure that you are subscribed to the HPPLC mailing list for your area of interest. Through the list you will receive pertinent information about meetings, deadlines, and opportunities. Attend as many events for premedical students as you can.

COURSE REQUIREMENTS FOR INDIANA UNIVERSITY SCHOOL OF MEDICINE

The following coursework is required for admission to Indiana University School of Medicine.

| IU School of Medicine Requirement | IU Bloomington course(s) that can fulfill the requirement |
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| General/inorganic chemistry, 8-10 credit hours (one academic year, including both lecture and lab) | CHEM-C 117/127 and CHEM-N 330* |
| Organic chemistry, 8-10 credit hours (one academic year, including both lecture and lab) | CHEM-C 341,** 342, and 343 |
| Physics, 8-10 credit hours (one academic year, including both lecture and lab) | PHYS-P 201 and 202 or PHYS-P 221 and 222 |
| Biological sciences, 8-10 credit hours (one academic year, including both lecture and lab) | BIOL-L 112, 113, and 211 |
| Biochemistry, 3 credit hours (one semester) | CHEM-C 383 or 483*** |
| Psychology, 3 credit hours**** (one semester) | Any course in psychology; some options would be PSY-P 101, 102 or 155 |
| Sociology, 3 credit hours***** (one semester) | Any course in sociology; some options would be SOC-S 100, 101, 358 or 365 |

* The Indiana University School of Medicine recommends CHEM-N 330; CHEM-C 118 will be accepted.

** Premed students should not enroll in the alternate organic chemistry course CHEM-R 340. Students cannot obtain credit for both CHEM-R 340 and CHEM-C 341.

***CHEM-C 484 (a course for biochemistry majors) or BIOL-T 440 (a course for biotechnology majors) may be substituted.

****Other behavioral science courses may be accepted. It is strongly recommended that students take at least one psychology course to prepare for the MCAT.

*****Other social science courses may be accepted. It is strongly recommended that students take at least one sociology course to prepare for the MCAT.

The minimum requirement for entering the Indiana University School of Medicine is 90 credit hours, excluding physical education and ROTC courses. Any major from the traditional arts and sciences curriculum is acceptable. Applications of students with educational backgrounds in other fields will be evaluated based on a minimum of 90 credit hours (three academic years) of college course work of arts and sciences equivalence.¹

Students should be aware that some medical schools will not accept Advanced Placement or credit-by-examination towards meeting admission requirements, or accept such credit only under restricted circumstances. Students should also be aware that receiving an exemption from a requirement is not generally considered equivalent to Advanced Placement credit, credit-by-examination, or credit from coursework. College-level coursework is often preferable for preparation for the Medical College Admissions Test (MCAT).

ADMISSION REQUIREMENTS FOR OTHER SCHOOLS

Requirements for many other medical schools are similar to the requirements of the Indiana University School of Medicine, but there can be important variations. Most medical schools require one year of lecture and lab in biology, general/inorganic chemistry, organic chemistry, and physics. Additional common requirements include

¹ Note that **very few** students are admitted and enroll having completed only the minimum number of required credit hours (three years of college coursework).

one year of English composition and a semester or year of math (see below). Students should review the Premedical Coursework page on the HPPLC website and review the websites of the individual medical schools for detailed information.

MATH

The majority of medical schools have no specific math requirement, although many of the required science courses at IU Bloomington have math prerequisites that students must meet before enrolling. Most undergraduate degree programs require math and strong math skills are important for success in premedical coursework. Of the medical schools with a math requirement some specifically require one or two semesters of calculus (as of 2016 only 11 of the allopathic schools in the U.S. require calculus). Some of these medical schools will allow substitution of a statistics course in place of the second semester of calculus, and coursework in statistics is important for success on the MCAT.

ENGLISH

The majority of medical schools in the United States require one or two semesters of English (as of 2016, 78 of the allopathic medical schools in the U.S. require English coursework for admission). *Since English coursework is so commonly required, if you plan to apply to a variety of medical schools, you should make plans early on in your college education to complete two semesters of English coursework.* Some medical schools will accept two semesters of literature while there are some that will require that at least one of the courses be a writing course. Although some students are exempt from the Indiana University English Composition Requirement on the basis of SAT or ACT scores, you should be aware that an exemption from a requirement is not considered to be equivalent to course credit by most medical schools and would not be accepted in place of college credit. Most, but not all, medical schools will accept courses that fulfill Intensive Writing requirements at Indiana University, although many will only accept Intensive Writing courses outside of the sciences.

MAJOR

Medical schools do not have a preference for any specific majors. There is neither a preference for science majors or for non-science majors. Therefore, you may major in almost anything. If you question this, read Chapter 2 "Building a Strong Foundation: Your Undergraduate Years" in *The Official Guide to Medical School Admissions*, available at the HPPLC front desk. One passage from Chapter 2 of the book may interest you:

Contrary to what many college students believe, there is no such thing as the "best" major. **In fact, no medical school requires a specific major of its applicants.** That's because admissions committee members know that students develop the essential skills of acquiring and synthesizing information through a wide variety of academic disciplines and therefore should be free to select whichever majors they find interesting and challenging.

Even so, many premedical students choose to major in a scientific discipline. If that's the direction you're heading, and you're doing so because you are fascinated by science and believe that such a major will be the foundation for a variety of career options, great. If you're doing so because you believe it will enhance your chances for admission, think again. Admissions committees welcome students whose intellectual curiosity leads them to a wide variety of disciplines.

And no... you won't necessarily be at a disadvantage if you choose to major in English, for example, rather than biology. Using just one measure, those of MCAT scores, you may be surprised to learn that there is very little difference in median total scores among those who major in the humanities, social sciences and biological sciences.²

You should consider a major which you enjoy, in which you perform well, or which might serve as a basis for further graduate work or for employment in the event you choose not to apply or you are not admitted to medical school. Admission committees expect variety in an educational program, including a significant number of humanities and social and behavioral science courses in addition to science courses. The majority of our premedical students major in science; however, many applicants majoring in non-science areas are highly successful applicants to the Indiana University School of Medicine as well as to other medical schools. All

² Association of American Medical Colleges, *The Official Guide to Medical School Admissions, 2014 Edition*, (Washington, D.C. 2014) p. 10

applicants must meet the schools' specific requirements, regardless of major. At IU-Bloomington, premedical students usually choose a major in the College of Arts and Sciences, although majors from other schools may be selected.

FACTORS IN ADMISSION

A number of factors may be considered by medical school admission committees. These differ in importance by school, but generally include academic credentials (GPA, course load, and grade trends), MCAT scores, a personal interview, letters of evaluation, perception of personal character, interpersonal skills, demonstrated knowledge of and commitment to the profession and knowledge of the school and its program. Some schools interview only those applicants meeting certain initial standards based on residency, GPA, and MCAT. It should be noted that a low GPA and MCAT cannot be overcome by an excellent interview; however, one low grade or a semester of poor grades will probably not keep a good candidate out of most medical schools if there is subsequent strong improvement.

MEDICAL COLLEGE ADMISSION TEST (MCAT)

The Medical College Admissions Test is a standardized exam required by medical schools across the country. The MCAT plays a significant role in medical school admissions decisions. You cannot substitute a sparkling personality or hours of volunteer work for an acceptable MCAT. The MCAT is typically an extremely challenging exam, even for the brightest and most talented students.

The MCAT is designed to assess competencies in areas important for success in medical school and a career as a physician. Concepts in biology, chemistry, and physics represent core areas in the sciences you will need to master, and you should complete coursework in these areas before taking the exam. You should also take courses in psychology, sociology, and statistics before taking the MCAT.

There are specific college courses that you should complete before the MCAT, but beyond that, you should use your undergraduate education to become a skilled, critical reader and thinker. Taking challenging courses in the sciences, the humanities, and social sciences can help you develop the reasoning skills you will need for this exam.

A new version of the MCAT was introduced in spring in 2015. You will likely schedule this exam after your junior year of college in the summer of 2020, or later. Just like the old exam, the new MCAT tests core science concepts in biology, general chemistry, organic chemistry, and physics. The new exam also tests content in additional areas such as biochemistry and cellular/molecular biology in the natural sciences sections of the exam to reflect recent changes in medical education. In addition, a new section of the exam, the *Psychological, Social and Biological Foundations of Behavior* section, tests concepts from the social and behavioral sciences, reflecting a concern for the importance of socio-cultural and behavioral determinants of health and health outcomes. A new *Critical Analysis and Reasoning Skills* section of the exam tests broad analysis and reasoning skills. The new exam also places greater emphasis on research methods and statistical reasoning. You should consult information on the HPPLC website on preparing for the MCAT and courses at IU Bloomington that you should complete before the exam.

ACADEMIC EVALUATIONS

As part of your application to medical school you will be required to submit academic evaluations written by your professors. Evaluations are usually requested from professors in the sophomore and junior years and at the conclusion of the class, rather than a year later. If you have had particularly noteworthy achievements in a freshman class, these too may provide a valuable evaluation.

All medical schools require at least one letter from a science instructor, and many schools require two science recommendations. You will need to make an effort to get to know your professors in your science courses. Undergraduate research provides another wonderful opportunity for interested students to develop relationships with faculty.

In addition to science evaluations, some medical schools require at least one recommendation letter from a non-science professor. Academically challenging courses in a non-science subject of interest will be one excellent means to develop and demonstrate your intellectual versatility.

We strongly urge enrollment in some small size or seminar-type classes in which you work closely with your professors. Make yourself known to instructors if they have time to talk during office hours – even if you think you understand all the material. Taking more than one small class from a teacher may be helpful. Getting an evaluation from an instructor in a small upper-level class in which you have demonstrated exemplary work is ideal.

Do not underestimate the importance of obtaining recommendations, and do not leave this task until late in your junior year.

In addition to questions from students about major, requirements for admission, the MCAT and recommendation letters, here are a number of additional questions frequently asked, with our answers.

IS THERE A PREFERENCE SHOWN FOR THE BACHELOR OF SCIENCE OR BACHELOR OF ARTS DEGREE?

No. Each applicant's record is evaluated on an individual basis. Both Bachelor of Science and Bachelor of Arts degrees are acceptable. Often a B.S. program in the sciences requires a student to delve into the subject in greater depth, and an admissions committee will be aware of this fact. The B.A. degree leaves room for a greater breadth of study and this, too, may be attractive to all admissions committees. Committees look more at the quality of the transcript rather than the name of the degree.

SHOULD I ENROLL IN AN HONORS PROGRAM?

If it interests you, yes. In many instances, the greater depth and breadth of honors programs/courses are reflected in a greater knowledge of the subject area in question. Classes are often smaller, and classmates are similarly motivated achievers. Many successful medical school applicants have enrolled in honors programs; however, many successful applicants have completed rigorous curricula which did not include honors courses.

WILL I BE A STRONGER APPLICANT IF I COMPLETE DOUBLE MAJORS OR DEGREES? WHAT ABOUT MULTIPLE MINORS?

No, not simply because of the majors/degrees/minors that you completed. In itself, completing a double major/degree will not automatically make you a more competitive applicant. In addition, you should consider that combining multiple majors, degrees, or minors can lead to more complicated scheduling challenges, which can for some students result in a weaker academic performance overall. There are tradeoffs to such choices, and excelling in premed coursework in itself is challenging enough. It is generally more favorable to complete one major and maintain a strong performance in premed coursework than to complete multiple academic credentials with a lower GPA.

DO MEDICAL SCHOOLS REQUIRE A FOREIGN LANGUAGE FOR ADMISSION?

The College of Arts and Sciences at Indiana University Bloomington requires the study of a foreign language. We know of no medical school that does; however, medical students and practicing physicians have found working knowledge of a second language very helpful.

WHAT'S SO DIFFICULT ABOUT BEING A PREMEDICAL STUDENT?

For many freshmen, the most difficult task is to acquire the study skills and self-discipline required to attain academic excellence. To succeed you need to develop strong time management skills. Many freshman premed students have been highly successful in high school. They frequently have been accustomed to being "stars," without having developed systematic study habits. The success of your academic transition to Indiana University Bloomington depends not only on ability, but also strongly upon motivation, organization, and the learned skills of studying effectively. You should plan to spend at minimum two hours on studying and class preparation per week outside of class for every credit hour in which you are enrolled; some science courses will require much more than this commitment. Students who succeed in gaining admission to medical school generally spend about 30 hours or more per week on class preparation on a consistent basis. Some of you will initially be discouraged and will have to have the determination to learn how to study more systematically. Demands of the premedical curriculum are rigorous. You may have to work harder than students who are not aiming for competitive admission graduate programs.

IS IT CHALLENGING TO GET INTO MEDICAL SCHOOL?

Even among those students who succeed in passing premed science coursework and take the MCAT, in most years less than half of all applicants to MD programs are admitted. In 2016 there were 51,019 applicants competing for approximately 21,000 seats in allopathic medical schools. If you do the math, that means that fewer than one out of two applicants were admitted. There are far fewer seats available in medical schools than qualified applicants. Medical school admission committees are able to ask for high standards. You must be determined, well prepared, and well informed. You should actively explore alternative career paths – keep your options open!

IS IT ALL OVER IF I HAVE A BAD SEMESTER?

There is a false but persistent rumor among freshman premedical students that if you have a bad science grade or a bad semester you will have to give up. That's not true. Medical school admission committees look carefully at student abilities and development. They realize that not every student enters college with a burst of academic brilliance. They expect an excellent academic record, but will make allowances for a problem semester or a slow start---**some** allowances. The most important thing may be to quickly acknowledge and correct your mistakes, instead of repeating them!

WHEN SHOULD I TAKE THE MCAT?

The best advice is to take the MCAT when you have thoroughly prepared and are ready to perform well on the exam. You will want to consider the timeline of completion of premedical coursework and the timing of your application also in deciding when to schedule the exam. Before taking the exam, you will need to complete science coursework in biology, general chemistry, organic chemistry, biochemistry, and physics. You will also need to take coursework in psychology, sociology, and statistics before the exam.

If you are planning to begin medical school directly following graduation, then you should plan to complete the coursework needed by the spring of your junior year, and take the MCAT early in the summer between junior and senior year. You should try to take the MCAT by early summer of whatever year you plan to apply to medical school. For example, if you are applying for the entering medical school class of fall 2021, we would recommend that you complete all premed coursework needed for the MCAT by spring semester of 2020 and take the exam in the early summer of 2020.

WHAT IS THE MEAN GRADE-POINT AVERAGE (GPA) OF STUDENTS ADMITTED TO MEDICAL SCHOOLS?

It varies from school to school. The average GPA for the Indiana University School of Medicine usually is around a 3.7 to 3.8. While numbers are important, trends, courseloads, and personal circumstances all may enter into admissions decisions. Preserving a 4.0 GPA by taking a light courseload, spreading science courses out, or completing them over the summer or at other campuses can be self-defeating, as admissions committees are on the lookout for students who are pursuing such strategies to artificially inflate their GPA's. Beware of advice to take certain courses that are thought to be "easy" in order to boost your GPA (such advice can often be faulty, anyway). If premedical students on our campus have determined that they are "easy" courses, medical school admissions committees might make the same determination.

ARE EXTRACURRICULAR ACTIVITIES IMPORTANT?

In addition to high levels of academic achievement, medical schools look for many traits in applicants, including motivation, evidence of concern for serving others, responsibility, maturity, leadership, communication skills, breadth of interests, and ability to manage multiple tasks. Students are encouraged to participate actively, but not to become so over-involved that their academic performance suffers. Moreover, a list of organization memberships means little. An admissions committee will be interested to know what you have contributed. Volunteering activities off campus may help you develop a more mature perspective than activities in which you are exclusively interacting with other college students from your same age group.

There is no list of preferred activities. However, volunteer activities through which you develop your interpersonal skills and gain experience working with people from a wide variety of backgrounds (not just fellow college students), are especially relevant. Any volunteer activity that requires you to provide support for people facing

distress will especially be valued by admission committees as a means for helping you to prepare for the role of a physician and develop transferable skills.

A good beginning resource for finding appropriate volunteer activities can be found in the medicine section under "Community Service Experience" on the HPPLC website (<http://www.hpplc.indiana.edu/medicine/med-coexp.shtml>). Also, a central location for those seeking these activities may be found on the Bloomington Volunteer Network website at <http://bloomington.in.gov/volunteer/>.

WHAT IS OSTEOPATHIC MEDICINE?

Osteopathic Physicians (DOs) are fully licensed physicians and share the same privileges as MDs. They can analyze, diagnose, prescribe drugs and therapy, perform surgery, and pursue all of the medical specialties available to MDs. Osteopathic medicine began as a nineteenth-century health reform movement that emphasized preventive care and allowing the body to heal without overuse of medications. While many of the osteopathic schools still emphasize these principles in their training, in many respects M.D.'s and D.O.'s practice medicine in identical ways today. Like allopathic physicians, osteopathic physicians prescribe medication, perform surgery, and practice in specialty areas. However, osteopathic physicians are trained in some special areas in which allopathic physicians do not receive training. Osteopathic physicians receive hundreds of hours of additional training in manipulative medicine techniques and diagnosis. With Osteomaniplulative Treatment (OMT), Osteopathic physicians use their hands to diagnose injury and illness and encourage the body's natural healing processes. The patient is viewed as a whole rather than a collection of parts. Special attention is focused on the musculoskeletal system as it reflects and influences the condition of all other body systems. Osteopathic schools hold that this training makes possible a better understanding of the ways that an injury and illness in one part of your body can affect another.

WHAT CHANCE DOES A NONRESIDENT HAVE AS AN APPLICANT TO THE INDIANA UNIVERSITY SCHOOL OF MEDICINE?

Many state-supported schools show preference to their own state residents and admit a significantly higher number of students from their own state. Indiana University School of Medicine shows preference to in-state residents, but it is not unusual for the school to offer several places to nonresidents, and non-resident Indiana University students with good records are encouraged to apply.

HOW DO I KNOW IF MEDICINE IS THE RIGHT CAREER FOR ME?

Read, talk, listen, observe, and compare. Shadow physicians to learn what they do on a day-to-day basis. Volunteer in a hospital or free clinic and observe a variety of healthcare providers. Read about healthcare issues and changes occurring in medicine. Talk with physicians about what they like and don't like about their profession. Attend HPPLC meetings and listen to health professionals who come to talk about their careers and answer student questions. Pay attention to your progress in the sciences. Are you a good science student? Observe through volunteer opportunities what it will be like to work with people requiring medical assistance. Shadow in a wide variety of healthcare careers to help determine the best fit for you. That's a lot of work--but if you enter the medical profession, you may be a physician for forty or more years. Make sure that you like doing what physicians do.

HOW CAN THE HEALTH PROFESSIONS AND PRELAW CENTER HELP ME?

Preparing for medical school requires careful, long-range planning and accurate information. Advisors at the Center specialize in helping students prepare for medical careers. Advisors can help you with questions regarding volunteering, preparing for the MCAT, how to request recommendations, and navigating the application process. Our website contains useful information on preparing for medical school and other health professions. We want to help you succeed!

This document has been prepared for Indiana University - Bloomington students by the Health Professions and Prelaw Center. Please note that specific requirements and policies can change at any time without notice. Students are responsible for obtaining the most current information directly from the application services, schools, and programs in which they have an interest.