



Frequently Asked Questions

Planning Your Health Careers or Pre-Med Studies

www.brown.edu/go/healthcareers

YOUR PREPARATION TO EXPLORE HEALTH & MEDICINE AND PREPARE TO APPLY

Health Professions Competencies

Healthcare is a dynamic field of study and professional realization. As you explore your interests in the health professions, guidelines from the Association of American Medical Colleges (AAMC) help you gauge your level of preparation and serve as a roadmap to your self-reflection, academic, clinical, research and other activities. To strengthen their holistic approach to the application review process, the AAMC with input from medical professionals and educators developed a set of 9 inter- and intra-personal competencies essential for success in medical and other health professions schools. These personal competencies complement the 6 science, thinking and reasoning competencies typically associated with learning in an academic context through course work, research, teaching or other means of developing and applying knowledge. These 15 competencies give detail and clarity to help you reflect, engage with learning, service and leadership, and prepare to apply. Medical schools are increasingly including these competencies in their application evaluation processes. This is great news for students and future applicants. It ensures that admission committees evaluate applicants holistically, not only based on grades and test scores. The MCAT, revised in 2015, takes an integrative approach to the sciences and incorporates knowledge in the social and behavioral sciences to reflect the same holistic approach. Use these competencies first to reflect on the career direction you are taking and then to guide your choices of courses, concentration(s), clinical, research, service or other volunteer activities while at Brown. **Allopathic (M.D.) schools** have started to adapt their admission expectations to reflect this- an ongoing process. Beginning to plan now to develop knowledge and qualities that demonstrate these competencies will be very helpful to you as an applicant in the future. **Osteopathic (D.O.) medical and other health professions schools** look similarly at personal, scholastic and analytical qualities but do not explicitly call them competencies. However, whether you wish to pursue education and a career in Allopathic, Osteopathic, Dental, Veterinary medicine or another clinical health profession, these competencies offer an informative framework in which to place your academic and experiential learning activities as an undergraduate student. The competencies are listed below and detailed on our website's **HEALTH PROFESSIONS COMPETENCIES** page. Also included is information about the evolution of the reform to competency-based medical education. The competencies are: **INTERPERSONAL COMPETENCIES: Service Orientation, Social Skills, Cultural Competence, Teamwork, and Oral Communication.** **INTRAPERSONAL COMPETENCIES: Ethical Responsibility to Self and Others, Reliability and Dependability, Resilience and Adaptability, and Capacity for Improvement.** **THINKING AND REASONING COMPETENCIES: Critical Thinking, Quantitative Reasoning, Scientific Inquiry, and Written Communication.** **SCIENCE COMPETENCIES: Living Systems, and Human Behavior.**

YOUR HEALTH CAREERS PORTFOLIO IN ASK

Reflect, prepare, track your accomplishments, and areas for improvement

The field of health and medicine is continually evolving. To help guide you better, we designed the **Health Careers Portfolio in ASK**. The portfolio is designed to promote self-reflection and to track your coursework and co-curricular activities relevant to the health careers. Every year early in the fall semester, complete the portfolio questionnaire for your college year that will help you plan and reflect on your preparation for the study and practice of your chosen health profession. Articulating your passions and interests can sometimes be difficult. Your portfolio enables you to do just that by helping you identify your interests, evaluate your accomplishments, and plan your own growth. You will be able to look back at your questionnaires from previous years and assess the areas in which you need to improve. Your answers will help you be better prepared to apply to medical or other health professions programs. They will also help us get to know you better so we can provide you with more targeted guidance during your time at Brown. The Health Careers Portfolio is described in detail on our website and is discussed during Orientation and information sessions throughout the year. We look forward to getting to know you better through your Portfolio.

ACTIVITIES

What kinds of co-curricular activities are helpful or appropriate if I am considering medical school or another health profession?

Medical and other health profession schools look for evidence that candidates for admission are making an informed choice and that they are altruistically oriented. Hence, any activities that help you to learn about the profession are important. Experience in a clinical setting is required for admission. In addition, you should engage in service- and leadership-oriented activities that interest and inspire you. As detailed above consider the competencies as a framework when reflecting on and selecting co-curricular activities to get involved with. If you are considering a career in dentistry or veterinary medicine you may be required to have spent a certain number of hours volunteering, interning with or shadowing a practitioner in the field. Be sure to check the requirements for schools in which you are interested for specific guidelines. Most successful health professions school applicants would have had continuity in their clinical and other activities for a couple of years or more prior to applying for admission. Use your academic years and summers to plan and engage with a range of co-curricular activities so you balance your time commitments effectively and engage more deeply.

CONCENTRATIONS

What concentrations are “best” if I am pre-med or considering the health professions in general?

Medical schools, as well as other health profession training programs, do not require any particular concentration. You should choose your concentration based on your academic interests. As you think of your concentration and other courses to take, consider that college offers a unique opportunity to explore different knowledge areas. Don't be afraid to take advantage of all that Brown's curriculum has to offer- it will make you a well-rounded individual and a stronger candidate for admission. The Thinking and Reasoning as well as Science competencies can help inform your choice, but keep in mind that learning has many dimensions and you don't have to go about your Brown studies solely planning for health profession school applications.

CONCENTRATING OUTSIDE OF THE BIOSCIENCES

If I am not a Biology or Neuroscience concentrator, how many Biology courses should I take in order to be a competitive candidate and to do well on the MCAT or DAT? Any suggestions about which are the most useful ones?

In general, two biology courses with labs will prepare you adequately for the MCAT, DAT, or other standardized test though taking more than two would strengthen your preparation and credentials significantly. You should begin with BIOL 0200 unless you have an AP score in biology or other equivalent preparation. Physiology (BIOL 0800) and Genetics (BIOL 0470) are both excellent courses to take in preparation for a career in the health professions. Students who concentrate in fields other than the biosciences, will benefit greatly from taking a few biology or neurosciences courses beyond the required minimum. These additional courses do not need to have labs. Note that Biochemistry (BIOL 0280) is an excellent course to take; it is necessary for the new MCAT and is taken by Brown students as part of their chemistry preparation. This course would not be considered part of your biology course work, however. For additional courses in the life sciences, explore the Biology and Neuroscience curriculum and choose courses based on your interests and prior preparation.

GRADES

Do I have to get straight A's or mostly A's to be a competitive candidate?

While it is important to have a strong academic record to be a competitive candidate for admission to health professions programs, it is certainly not true that you must have an A in every single class that you take. If you experienced challenges during your studies but your record improved, this will be noted by admission committees. The best information source about grade point averages needed for admission to MD programs is the “Medical School Admission Requirements”, the official guide from the AAMC. This web-based MSAR and its print companion The Official Guide to Medical School Admissions” contain all information about individual schools and the application process.

<https://students-residents.aamc.org/applying-medical-school/applying-medical-school-process/medical-school-admission-requirements/> Other health professions vary in their competitiveness for admission. Print guidebooks for professions such as the Osteopathic Medical College Information Book (CIB) for D.O. schools, the Veterinary Medicine School Admission Requirements (VMSAR) for veterinary schools, and others are available in the Health Careers Advising

office reference library; most are on the web. Use them to help you learn about schools and gauge your preparation to apply. Be sure you know the requirements for the schools in which you are interested this *is your responsibility*.

What counts in the Science GPA (BCPM- Biology, Chemistry, Physics, and Math)?

Each health profession has its own online common application service which has its own method of classifying courses for the science GPA. **Usually, application services count courses listed in biology, chemistry, physics and mathematics toward the science GPA.** Application serviced will often include neuroscience courses under biology, but they do not include courses in psychology, cognitive science, geology or computer science (engineering is usually a separate classification). Mathematics generally includes courses in applied math as well as statistics courses in the social sciences (e.g., sociology and psychology). For more information on which courses count toward the science GPA, consult the instructions provided by the application service(s) you use when applying for admission, (e.g., the AMCAS Application Course Classification Guide).

S/NC COURSES

Is it OK for a Brown pre-med to take a course satisfactory/no-credit? If so, which ones and how many?

You should not take any of the courses required for admission satisfactory/no-credit (with the obvious exception of courses that are only offered Mandatory S/NC). Note that S/NC* courses (with an asterisk) indicate that the S/NC grade option was mandatory. The asterisk does not indicate that you passed the course “with distinction”. Note also that “with distinction” does not appear on the Brown transcript. Courses not required for admission may be taken S/NC but you should be judicious in using this option. Schools find it difficult to evaluate applicants who have taken a large number of S/NC courses, so be careful. Taking one or two S/NC courses during your studies at Brown in areas outside of your concentration or major area of study should not be problematic. You should only choose the S/NC option if you believe that it will enhance your educational experience in a given course. Never use the S/NC option to make it easier to do well in the rest of your courses for a given semester. The S/NC option is not intended as a time-management tool or grade point average enhancer!

SUMMER, WINTER, OR ONLINE COURSES

Is it OK to take required health careers courses in the summer, winter or online at Brown or elsewhere?

In general, most health profession schools, and particularly medical schools, do not view summer courses as favorably as they do courses taken during the fall and spring terms at Brown. However, if you have a compelling academic rationale for taking a summer course (e.g., to enable you to study abroad, or to participate in research or clinical activities which you would miss otherwise) and if you think you will be a strong applicant overall, you could take a required course over the summer. You should preferably do so at Brown or at a university with a strong academic reputation (no community colleges or online courses). Furthermore, we do not recommend that you take more than one required class in the summer for the duration of your undergraduate education. It is best not to take any required science courses during the summer. No study abroad courses, during the summer of the academic year would be accepted in fulfillment of pre-health/pre-medical requirements although they may count for your concentration. No requirement courses should be taken during Brown’s Wintersession, even if they are offered during the regular fall or spring semesters. Medical, dental and veterinary schools generally do not accept any online courses. If you plan to apply to other health professions schools, which indicate that they may accept online courses, you could do so. This may not put you in the strongest position as an applicant, however.

RESEARCH

Is participating in research really critical if I am pre-health or pre-med?

Engaging in research, whether in the sciences or in other disciplines, is a wonderful way to enhance your education and to build connections with faculty mentors. This can certainly help your application to medical school (or to other health profession schools) as most applicants would have some research experience. Successful health practitioners must be intellectually curious and have the ability to keep up with the changing science that underlies their practice. The Science, Thinking and Reasoning Competencies are developed not only in course work, but also in the process of scholarly inquiry- one more aspect to consider when thinking about research opportunities. However, you should never undertake research unless you have genuine interest in it. Faculty members at Brown, as well as members of admission committees, can recognize lack of genuine interest or enthusiasm for a particular activity listed on an application. You

will be a stronger applicant if you are truly excited about an activity in which you have participated and if you have engaged in it well. A wide array of research opportunities is listed on our website, including intensive summer immersive programs for students from backgrounds under-represented in the health professions.

THE MATH REQUIREMENT

How much Math is really required for the majority of med schools?

Health profession schools vary in their mathematics requirements. Over half of all MD programs require up to two semesters and all remaining schools strongly prefer some experience with college mathematics. The majority of medical schools (M.D. and D.O.) with a math requirement will look for between one and two semesters of math. Most of them would expect a semester of calculus and a semester of statistics (offered by a variety of departments). No health professions schools require multivariable calculus. A small number require two semesters of calculus but they will allow you to substitute college courses with advanced placement credit or credit from other college-level exams taken in high school. Until recently a small number of schools required a full year of Calculus. This is unlikely to be an issue but check school sites a year or two before you apply. If you had AP or other credit for MATH 0090 and/or MATH 0100, you should still take at least one math course at Brown (statistics recommended).

THE CHEMISTRY REQUIREMENT

Will CHEM 0330, 0350, 0360 or CHEM 0330, 0350 and BIOL 0280 be sufficient for most applicants?

No. Nearly all health profession training programs, including medical, dental, and vet schools, require four semesters of chemistry with lab. Most health professions schools look at Biochemistry as an excellent substitute for a second semester general chemistry with lab. Knowledge of biochemistry is also necessary for the MCAT beginning in 2015. Some medical schools require a five-course sequence in chemistry which includes biochemistry together with 4 semesters of chemistry with lab (2 general and 2 organic).

At Brown there are two typical course sequences depending on the level of your Chemistry preparation and the health professions programs to which you plan to apply. Most students come to Brown with a strong high school background in chemistry, which may include AP scores, and begin the course sequence with CHEM 0330, followed by CHEM 0350, CHEM 0360 and BIOL 0280 (or CHEM 0400 if offered and a good fit for your concentration). Note that the Chemistry department does not place AP scores on student transcripts.

Students without strong high school preparation in Chemistry and AP scores begin with CHEM 0100, followed by CHEM 0330, CHEM 0350, CHEM 0360, and BIOL 0280 (or CHEM 0400). Note that CHEM 0100 can meet the first semester general chemistry requirement but should only be taken by students with no high school chemistry background. Do not take CHEM 0100 after taking a higher-level chemistry course simply to meet the requirement. This will look very bad on your applications! Admission committees will expect you to take challenging courses that are appropriate for your level of preparation.

There are two ways in which you could complete the five-course sequence in chemistry. If you completed CHEM 0330, CHEM 0350, CHEM 0360, BIOL 0280 (or CHEM 0400) take one additional general chemistry course with lab. This could be either CHEM 0400 or CHEM 0500. If you plan to take a more advanced course, consult with the schools where you plan to apply first. If you completed CHEM 0100, CHEM 0330, CHEM 0350, CHEM 0360 and BIOL 0280 (or CHEM 0400) this should be sufficient to meet the five-course requirement.

For all health professions, ***it is your responsibility*** to be sure that you have met all applicable admission requirements.

THE BIOLOGY REQUIREMENT

What courses would be most helpful for the MCAT, DAT or other tests? How would my concentration or APs affect my course choices?

Nearly all health professions programs require 2 biology courses with lab. The first course in the biology sequence is BIOL 0200. If you have an AP score or other relevant preparation that places you out of this course, take two advanced courses above the BIOL 0200 level. Admission committees do not accept AP scores to fulfill the Biology requirement. Physiology (BIOL 0800) and Genetics (BIOL 0470) are both excellent courses to take. If you are not a Biology or science

concentrator, we advise that you take a few Biology or Neuroscience courses in addition to the two required ones (not necessarily with lab). Most health professions programs consider Neuroscience to be equivalent to Biology so your additional courses could be taken in this department. We strongly recommend that you take the two required lab courses in the Biology department so you cover material you need for the MCAT or DAT and so schools won't have difficulties assessing your preparation. More is outlined above under CONCENTRATING OUTSIDE OF THE BIOSCIENCES.

OTHER ACADEMIC REQUIREMENTS

What else is required?

Besides math, chemistry and biology, most health profession training programs require: two semesters of physics with lab. Two semesters of English are also required. This requirement can be met by taking college composition (a.k.a. expository writing) or literature courses in English (foreign literature in translation to English would be acceptable too). Courses in other disciplines (e.g., comparative literature, classics) may also be fine so long as their main focus is on literature. WRIT designated courses satisfy the requirement, so long as they fall outside of the categories above; science WRIT-designated courses won't meet the requirement. This is your opportunity to embrace the Open Curriculum.

Health Careers Advising cannot endorse any particular course. The two categories above meet the requirement.

Please consult the Health Careers Advising website for a complete description of the basic admission requirements. Beginning in 2015 the MCAT contains a section on the Social and Behavioral Sciences and it is important that you have exposure to foundational concepts in these two fields. Some medical schools require a semester in both. The rest expect this, even if they don't explicitly require it. You would also need content knowledge for the MCAT and, just as with the English requirement, this is your opportunity to immerse yourself into Brown's Open Curriculum. We encourage all Brown students to explore the curriculum and take one or two foundational courses in the behavioral and social sciences to prepare well for the MCAT, to give their education further breadth and to position themselves well as future applicants.

Are there additional requirements?

In some cases, schools have additional and particular requirements. For example, Biochemistry is expected by most medical, dental and veterinary schools and is necessary for the MCAT (see Chemistry above). Some vet and dental schools, and many physician assistant programs require anatomy; others may want you to have course work in the behavioral sciences. Ultimately, for all health professions, it is your responsibility to be sure that you have met all applicable admission requirements. Consult the Health Careers Advising website for details and see GRADES above.

MCAT, DAT AND OTHER TEST PREPARATION

What is the best way to prepare for the MCAT?

Most importantly, you should take the exam only after you have completed the necessary courses successfully and have given yourself ample time to prepare. All of your MCAT scores are visible to every medical school to which you apply and it is important to take the exam only when you are prepared to do your best work. Most students and alumni take the exam in the year prior to their application (which starts every June). About 70% of Brown students and alumni apply to medical school upon or a year after graduation. Nationally 61% of those admitted to MD programs applied right after graduation or a year or more later. Your academic preparation should include a biochemistry course, as well as a foundational course in the behavioral and social sciences. After you complete these courses 3-4 months of dedicated study is typically sufficient. Both self-study and preparation courses can be effective though each has pros and cons. A test prep course gives you plentiful review materials and practice exams, as well as a lot of structure. However, the price is high, often exceeding \$2,000. Self-study is less expensive and many good review books and practice exams are available at bookstores and through on-line booksellers. Note that this approach requires self-discipline. If you opt for self-study, consider forming a study group. Be sure that your partners are self-motivated, reliable, and dedicated! Consult the official MCAT preparation web-based and print guide books. We strongly recommend that you use all official MCAT practice tests, the many tutorial and self-evaluation materials from AAMC. To learn more about the exam consult our Standardized Tests page and the AAMC at: <https://www.aamc.org/students/applying/mcat/>.

APPLICATION TIME-LINE

When should I apply, including finishing the required courses, taking the MCAT, DAT and actually submitting applications?

The process of applying to medical school, or to any other health profession training program, takes up to one and a half years. Students planning to take one or more years off before beginning their professional training have much flexibility and can develop stronger application credentials. Students who wish to matriculate to a health profession school in the fall immediately after college graduation must have completed all of their required pre-med/pre-health coursework and have taken the MCAT, DAT, GRE, etc. in the spring and no later than May of junior year. Nationally 63% of successful M.D. applicants take at least one year to develop strong credentials, work, volunteer, travel or combine those. Nearly three-quarters of Brown applicants take at least a year off. The national average age of matriculating M.D. students is 24 and rising. Generally, it is more challenging to succeed in the process when applying between junior and senior year because of the shorter time frame.

HOW MANY SCHOOLS TO APPLY TO?

To how many schools does a "typical" pre-med apply?

The average applicant to medical school from Brown University applies to about twenty schools. Nationally, among the ~52,000 applicants the average is fifteen schools. Applicants to other professions generally apply to about ten to a dozen schools.

LETTERS OF RECOMMENDATION

What are the best kinds of recommendations for med school?

The Health Careers Advisory Committee requires that applicants from Brown University have two letters of recommendation from faculty at Brown who have taught you and/or supervised you in an activity. At least one of these letters must be from a professor in biology (or neuroscience), chemistry, physics, or mathematics. Engineering concentrators with extensive course work and research in the field could opt for a letter from an Engineering instructor or supervisor. You are also required to have a third letter from an individual who knows you in an academic, supervisory, or mentoring capacity. This could be another Brown faculty member but it could also come from individuals on or off campus. You can add a fourth letter from a faculty member, mentor, supervisor, etc. (from Brown or elsewhere) if you feel that this will help to represent the breadth and depth of your experiences. This set of letters prepares you to meet admission committees' expectations and to present yourself well. In general, letters of recommendation should be substantive evaluations of the particular qualities that you will bring to your chosen profession. Therefore, the best recommendations come from people who know you well. Recommendations from high-ranking or well-known individuals who do not show substantive knowledge of your qualifications are not as helpful as letters from individuals who are less prominent but who have better knowledge of your abilities and experiences.

OTHER SOURCES OF ADVICE

Where else can I get advice about pre-med or other health careers?

- Dean Katherine Smith oversees Biology undergraduate programs and academic advising. Her office provides full academic counseling and assists all undergraduates studying the biological sciences and related areas. Her office and website also offer essential information about research opportunities at Brown and elsewhere. <http://biology.brown.edu/bug>. The advisors in the Biology Undergraduate Education program are generally knowledgeable about pre-med and other health professions issues. The Biology department is located in 124 Arnold Lab, 97 Waterman Street.
- David Targan, Associate Dean of the College, is knowledgeable about science education in general and undergraduate research in particular. His office is located in the Science Center. He holds weekly office hours which are posted on the Dean of the College web site at brown.edu/college and he can also be reached at David.Targan@brown.edu.
- For various aspects of your preparation for health careers programs, be sure to connect with advisors and mentors at the breadth of academic and co-curricular support offices throughout campus. CareerLAB and the Writing Center are especially helpful when you are working on resumes and personal statements. The Swearer Center can be an excellent resource as you seek volunteer opportunities in the community. The Curricular Resource Center as well as the Office of International Programs would be especially helpful as you plan your academics. The Tutoring Office and Academic Support Services can give you indispensable support with your academic preparation. The College office assists with general advising and support all aspects of your overall college experience. **Health Careers Advising** is the hub for all matters relating to your exploration of the health professions as educational and career options.