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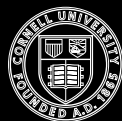


# Human Health Professionals

## Guide for First- and Second-Year Pre-Med Students

*This guide helps students navigate the process of selecting appropriate courses and gives advice related to the many decisions to be made prior to applying to medical/dental school.*

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Cornell University

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Diversity and inclusion are a part of Cornell University's heritage. We are an employer and educator recognized for valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.

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## Introduction

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Many students enter Cornell University certain that they want to use their education to develop strong credentials for a health career, while others decide on this career path after significant reflection and experience during the college years. The years spent at Cornell are a time for both the exploration of the curriculum and preparation for future careers. This Guide, along with the health careers advisors, will help students navigate the process of selecting the appropriate courses and give advice related to the many decisions to be made prior to applying to medical or dental school.

In the first year, the best way to prepare for any human health career is by focusing on two things: forming a support network and managing your academic life. A strong support system makes it easier to navigate the initially unfamiliar and often unexpectedly rigorous intellectual terrain. Similarly, a strong start in academics brings confidence and facilitates building a strong support system. By taking coursework seriously from the first to the last days of each semester and seeking the guidance available at Cornell, you will develop the confidence needed to continue preparing for professional school.

Because medicine is a profession dedicated to the service of others, students should develop and demonstrate a strong service ethic through varied experiences. Service to others may be inside or outside the classroom and can take many forms. Reflection on experiences, both service and clinical, is critical for demonstrating the development of the qualities of a health care professional. Demonstrating evidence of integrity, ethics, professionalism, written and oral communication, service-mindedness, and understanding of the health care field on applications to professional schools and in interviews is essential.

The path to a career in medicine requires students to engage in careful planning and preparation, including reflection, and to seek guidance with important decisions. The successful medical or dental school applicant uses the Cornell years to develop strong academic credentials, a demonstrated commitment to the field of healthcare and the service of others, and the interpersonal skills needed by future healthcare professionals.

## Frequently Asked Questions

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### What distinguishes Cornell's applicant pool to professional schools?

Each year around 400 undergraduates and alumni from Cornell apply to one of many different health professions schools. Our acceptance rate is about 25-30% higher than the national average.

### Which college should I enroll in?

As a Cornell undergraduate, you may enroll in the courses that fulfill the requirements of medical schools, regardless of college. Traditionally, Cornell undergraduate applicants to medical school have enrolled in the College of Agriculture and Life Sciences, the College of Arts and Sciences, the College of Engineering, or the College of Human Ecology. Your choice of college depends on your academic interests and goals; remember that academic success and engagement are linked.

### What should I major in?

Your choice of a major reflects your personal interests and professional orientation. Base your decision on what you want to learn, not how others will view you. The strength of the academic credentials, rather than the major, is the best predictor of who gains admission to health professional schools. You are more likely to succeed at—and benefit from—subjects that interest and stimulate you. Health career graduate schools do not require, recommend, or favor any particular undergraduate major course of study, and Cornell does not have a pre-health career major. In majors offered throughout the university, you can complete the pre-professional requirements while at the same time exploring your own interests. In this way, you exercise the option of discovering an alternative career.

*The Association of American Medical Colleges (AAMC) has stated, "Admission committee members know that medical students can develop the essential skills of acquiring, synthesizing, applying and communicating information through a wide variety of academic disciplines...students who select a major area of study solely or primarily because of the*

perception that it will enhance the chance of acceptance to a school of medicine are not making a decision in their best interest.”

Despite statements like the above, many students believe that medical schools prefer certain major areas. AAMC’s national data, however, refute this. In 2019, 40% of biological sciences majors, 48% of physical sciences majors, 47% of mathematics and statistics majors, 47% of humanities majors, and 40% of social sciences majors who applied were accepted to and matriculated to medical school. The differences among percentages of acceptance by major are not significant, and major choice cannot be used to predict acceptance to medical school.

### **How does my choice of major affect my first-year course choices?**

Those majoring in a science discipline may take one or two science and/or math courses each semester, depending upon the recommendations of academic advisors. However, humanities or social science majors may want to take only one mathematics or science course during the first year in order to be able to experiment with courses from several departments. Over four years, all the course prerequisites are available to all students needing them.

### **What guidance does Cornell give health careers-oriented undergraduates?**

Cornell has a structured Health Careers Program. The Career Library and the Health Careers Advisor in Barnes Hall provide information, orientation sessions, and advising for students in all colleges. The advisor has drop-in advising hours and scheduled appointments, and can also be reached by e-mail and telephone. Advising information is also available on the Health Careers webpage accessed through Cornell Career Services: [career.cornell.edu](http://career.cornell.edu).

Most of the questions that first-year, sophomore, and junior transfer students pose relate to academic requirements. It is best to address these questions to an advisor in your college or major.

College of Agriculture and Life Sciences, CALS Career Services, 140 Roberts Hall

College of Arts and Sciences, Ana Adinolfi, 172 Goldwin Smith Hall and Naya Sou, G17

Klarman Hall

College of Engineering, Benjamin Martin, 180 Rhodes Hall

College of Human Ecology, Shaun Gendrue, 113 Academic Surge A

Office of Undergraduate Biology, 216 Stimson Hall

Several advisors are available depending on your question: Beth Howland, Megan Gallagher, Jeff McCaffrey, Laura Schoenle, and student peer advisors.

This *Cornell Health Careers Guide for First and Second Year Pre-Medical Students* is shared at New Student Orientation and is available on the Career Services website.

### **What courses should I take?**

Cornell course recommendations are based on two criteria: fulfilling prerequisites for most health career professions and providing optimal background for standardized admissions exams, which test the knowledge gained from undergraduate coursework.

Professional schools have their own rules regarding courses they will accept. For details on a particular school’s requirements, students are advised to read the individual school’s web pages, check the *Medical School Admission Requirements* (MSAR) database or the *ADEA Official Guide to Dental Schools*, or contact admissions offices. Generally speaking, regardless of undergraduate major, professional graduate schools require specific undergraduate coursework. Cornell offers all required courses, often in alternative formats, such as individualized instruction (sometimes called auto-tutorial) or lecture-based. While these prerequisites vary between professions, certain minimum requirements are standard within each health profession. For medicine, for example, all general or introductory science courses must include a lab component or offer an additional course that is lab only.

The required and/or strongly recommended subjects, in alphabetical order, are:

Anatomy/Physiology; often required for PA/NP; otherwise an elective  
Biology, introductory; replacement with AP credit is discouraged  
Biochemistry; lab not required  
Chemistry; general and organic  
Microbiology; often required for PA/NP; otherwise an elective  
Physics; general  
English  
Math: statistics and calculus  
Social Science; introductory sociology and psychology (see pink pages in this guide)

### **What are the precise Cornell course recommendations?**

See pages 8-9 in this Guide.

### **What principles guide course selection and planning?**

Any of the courses outlined on pages 8-9 will fulfill the prerequisites for most health professions schools. Several factors, often competing, will guide course selection: balancing rigor with readiness to take on multiple prerequisites in the first year at Cornell, your interest in the subject, test scores, high school preparation, experience in rigorous courses, options for a major, and academic goals. Placement in the right courses is very important. *Cornell Courses of Study* describes the courses; the academic advisor and the directors of undergraduate studies (DUS) in relevant departments can explain the differences among courses and can help you select your courses.

### **What is the optimal sequence of courses?**

The *recommended order* in which to take these courses is: mathematics, chemistry or biology, and physics. Biology, chemistry, and mathematics need to be started by the sophomore year if you plan to apply to a health professions school at the end of your junior year for matriculation in the fall following graduation. Keep in mind, though, that less than 15% of all Cornell medical school applicants apply at the end of the junior year, and health professions schools are happy to see alumni and senior applicants. These more advanced applicants often experience a selective advantage due to the lengthy and comprehensive preparation they are able to demonstrate. Courses are usually (but not necessarily) taken during these years:

First-Year Writing Seminars - first-year  
General Chemistry – first-year/sophomore  
Biology – first-year/sophomore  
Mathematics – first-year/sophomore  
Physics – sophomore/junior/senior  
Organic Chemistry – sophomore/junior  
Biochemistry –junior/senior  
Mathematics – strong quantitative skills are essential for chemistry and physics.  
It is recommended that college mathematics precede physics.  
Psychology and Sociology – prior to taking the MCAT

### **Can I take required courses Pass-Fail or S/U?**

No. We do not recommend taking requirements for health professional school on a pass/fail, or Satisfactory/Unsatisfactory (S/U) basis. Medical/dental schools do not frequently accept S/U for prerequisite courses, though many will accept S/U during SP20 or SU20 semesters due to COVID-19, often on a case-by-case basis.

### **Will Advanced Placement (AP) Biology credits fulfill prerequisites?**

Check with an advisor before making a decision to use AP Biology credit (*see the Office of Undergraduate Biology website*). Generally speaking, students are advised not to use AP Biology credit because evidence has shown that students who use this credit may find themselves at a learning disadvantage in advanced courses.

Also, some health professions schools will not accept AP credit, even if Cornell has accepted it. Students are then left with the choice to take an introductory course after completing most undergraduate requirements and before applying, to take additional upper-level coursework, or not to apply to those schools that refuse AP credit. Some schools advise students to pursue advanced courses in biology, chemistry, physics, or other sciences, which provide reinforcement of previous courses, even though they may have met the minimum science requirements while in high school.

### **Are any other Advanced Placement (AP) credits accepted to fulfill prerequisites?**

With the exception of biology, most schools will accept AP course credit that has been approved and placed on the Cornell transcript before graduation from Cornell. *Check specific statements on medical and dental school web pages*. In deciding to use AP credit, keep in mind that many schools require a minimum of course-based lab work. Advanced placement can almost never substitute for the requisite number of labs. When enrolling in advanced courses, make sure they have labs that will fulfill basic requirements.

### **How do transfer students fulfill requirements?**

Transfer students should check that the courses they have taken at their previous college meet the requirements for entrance to their chosen health professions school. Also, the "Transfer Student Guidelines" on the Health Careers portion of the Cornell Career Services website provides guidance.

### **Can I take prerequisites as summer school courses?**

Required courses may be taken during summer session here or at other universities whose educational standards and rigor are comparable to Cornell's. In general, it is preferable to take these courses at Cornell during the regular school year in order to demonstrate that you can perform well even while carrying a full course load. Your college advising office can explain the procedure for attending summer school elsewhere.

### **What courses should I take beyond the requirements?**

Students should work with their academic advisors in choosing courses beyond the requirements. Some students decide to take courses similar to those taken in the health professions school in an attempt to demonstrate that they can perform well in the future environment, or to ease their studying during the first year of professional school. These advantages, however, should be weighed against possible disadvantages. These include not being able to take an elective that may be important to your personal development and undergraduate education, which may not be available for you to take once you have graduated from Cornell.

As you plan, also keep in mind that health professions admissions officers frequently speak of wanting to see both breadth and depth in a student's academic record. In choosing courses, you will want to strike a balance, avoiding a narrow approach on the one hand and a superficial approach on the other.

### **What is required for admission to health professional schools outside of academics?**

You will develop important qualities during your college years. Most important is what one Dean of admissions calls "a sustained commitment to excellence." Becoming a well-educated person with an understanding of human nature, developing the ability to think critically, imaginatively, and logically, and gaining personal competency in several areas outlined by the AAMC will make you a strong candidate. For more information on the core competencies, see the corresponding section in this Guide.

Your activities inside and outside the classroom should develop and strengthen interpersonal and intrapersonal skills, as well as your academic potential. You are not required to pursue activities in all areas, but service and clinical

experience are the most important. It is also important to gain experience out of your “comfort zone” which, for many college students, is their campus environment.

### **How do I learn more about the health care professions that interest me?**

Cornell regularly hosts healthcare professionals to speak with students on campus. Students should check Handshake, a service through which we send notices and reminders about these programs, via the Career Services webpage. In addition, our Alumni Connections Program (ACP), also administered through Cornell Career Services, matches students with alumni in health careers for short exploratory externships. The same office helps you find longer internships to gain research and clinical experience. You can identify alumni who are health profession practitioners through the online CUeLINKS service, and arrange conversations with them.

### **How does Cornell help me gain admission to a health professions school?**

In addition to advising and programs for health career-oriented students, Cornell offers virtually boundless opportunities for healthcare-related experience, both nationally and globally. We also provide abundant opportunities for undergraduate research, for teaching experience, and for service learning as well as for studying in many different countries.

When you are ready to apply, Cornell Career Services offers a Letter of Evaluation (LOE) service through the Health Careers Evaluation Committee (HCEC). This LOE is a strongly recommended component of applications to most schools of *human* medicine.

### **Which standardized admissions test (MCAT, DAT, OAT, GRE) will I take?**

The Medical College Admissions Test (MCAT) assesses an applicant’s understanding of concepts in science courses in biology, inorganic chemistry, organic chemistry, biochemistry, non-calculus-based physics, and social science courses in psychology and sociology. The DAT also tests this knowledge, with the exceptions of physics and social science courses.

In light of this, the MCAT/DAT should not be taken until courses are completed (or are within a few weeks of completion) and thorough preparation and study are complete. The best way to prepare now is to learn the material in your prerequisites solidly and to read the MCAT/DAT website for updates about twice per semester. The MCAT/DAT tests basic information and the Cornell curriculum will prepare you well. The MCAT is administered many times a year at designated computerized test sites, and the DAT is available at multiple times throughout the year at similar sites.

### **How do I stay informed about health career news?**

Students should create a Handshake profile (career.cornell.edu), indicate an interest in Health Careers, and permit Health Careers Program emails to be sent to their address by signing up for “Health Careers Notifications” e-mails. Students should stay alert to announcements about other communication avenues, through departmental communications, course announcements, etc.

## **MythBusters**

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**Myth:** *Admission committees look unfavorably upon taking “bridge” years (aka “gap” years).*

**Truth:** Medical schools prefer for candidates to apply when they are sure about their dedication to the field of medicine and can demonstrate readiness for medical school through academics, experience, and maturity. Many students use the year(s) after graduation to explore career options or to improve their credentials through academic work, clinical experiences, or service opportunities. Medical schools do not look unfavorably upon applying after taking “bridge” years. In fact, the average age of the 2018 entering medical school class was over 24 years of age, clearly reflecting that many students apply after a bridge year or more.



**Myth:** *It will “look better” to medical schools if I double major or add another minor.*

**Truth:** In fact, an applicant’s primary undergraduate major has little to no effect on acceptance rates to medical school. National data from AMCAS show that if anything, there is a slightly lower acceptance rate for health science majors versus other majors such as biology, chemistry, mathematics, or humanities. Cornell-specific data show no significant difference in acceptance rates by College or by major. You should excel in what you do; the best way to do that is to undertake a course of study that is interesting and engaging, whether or not those courses amount to a double major or a minor. An applicant with one major and a 3.6 GPA is certainly more competitive than an applicant with a double major and a 3.2 GPA.

**Myth:** *A high GPA will make up for a low MCAT score or vice versa.*

**Truth:** While academic credentials are certainly an important piece of a student’s application, they are just that, pieces of a bigger picture. Many other factors, including letters of evaluation, letters of recommendation, experiences, personal statement, and personal characteristics, will be evaluated in addition to the academic factors. Admissions committees may, however, question a “mismatch” between GPA and MCAT score (i.e. lower GPA and higher MCAT score or higher GPA and lower MCAT score), because they value academic excellence in all arenas and test taking skills. Remember, medical education is “book-ended” by standardized exams, the MCAT and the USMLE, and admissions committees need to have the confidence that students will succeed in medical school and beyond.

**Myth:** *I can take challenging courses over the summer or plan light semesters to maintain a high GPA.*

**Truth:** Medical schools review an applicant’s academic performance as a whole and on a semester-by-semester basis. Students should not plan light semesters with the aim of maintaining a high GPA as schools will note the avoidance of taking challenging courses during the regular semesters or while taking other challenging courses. Schools may allow some leeway or may be impressed by high achievement during a particularly challenging semester, however. Students should plan to take pre-requisite courses during the regular semesters, if at all possible.

**Myth:** *It doesn’t matter when I get clinical experience. I can do this right before I apply.*

**Truth:** The motivation for requiring students to gain clinical experience prior to applying to medical school is to ensure that students are well-informed and committed to the field of medicine and to the service of others. This commitment needs to be sustained and demonstrable through a student’s application. You should be able to answer the question, “*Why do you want to be a doctor?*” using concrete examples and experiences. It is not enough to have family members or close family friends that are in the medical field. Your experiences need to demonstrate your motivation for this career path; pressure from family or friends is not enough.

**Myth:** *If I am driven enough, I will be admitted to medical school one day.*

**Truth:** Admission to medical school is an extremely competitive process. In 2019, 53,371 students applied for the 21,869 available first-year seats in medical school, a 41% acceptance rate. Nationally, the average number of applications filed per applicant was over 15, leading to large numbers of applications filed at each of the medical schools. For example, Weill Cornell Medicine received over 7,000 applications in 2019. Some schools receive many more than that. A strong motivation is not enough to gain admittance to medical school. Because the process is so competitive, students should be prepared with an alternate career path, which may also be in the healthcare field. There are also postbaccalaureate academic record enhancement programs for those looking to improve their academic credentials, but these are very costly and do not ensure admission to medical school.. If you have experienced challenges during your Cornell education, please speak to a Health Careers Advisor.

**Myth:** *Applying to medical school is just like applying to undergraduate institutions.*

**Truth:** The application process, including standardized examinations, common application platforms, personal statements, and letters of recommendation, make the two processes seem very similar. In reality, these processes could not be more different. In fact, more than 80% of all undergraduate institutions accept more than half of their applicants, and most applicants receive at least one offer of admission, usually more. In contrast, the acceptance rates to individual medical schools range from less than 1% for private institutions to approximately 3% for in-state applicants to public institutions – in contrast to 4.8% for the most selective undergraduate institution (Curtis School of Music, Philadelphia, PA).

Undergraduate institutions such as Cornell are very selective, but applicants to Cornell were, most likely, also accepted to another undergraduate institution. Receipt of multiple acceptances, while expected during the process of undergraduate admissions, is much less likely during the medical school application process. In 2019, of the Cornell students who were accepted to schools of allopathic medicine, 35% were accepted to one school, 22% were accepted to two schools, 15% were accepted to three schools, 11% were accepted to four schools, and 17% were accepted to five or more schools. Thus, over half of those accepted to medical school were accepted to 1 or 2 schools.

## Cornell Courses that Satisfy Most Medical and Dental School Requirements

Subject	Cornell University Courses
<b>Biology</b>	<p style="text-align: center;"><i>Offered fall, spring, and summer</i></p> BIOMG 1350 Introductory Biology: Cell and Developmental Biology AND BIOG 1440 <u>or</u> 1445* Introductory Biology: Comparative Physiology <i>*BIOG 1445 is an individualized instruction format course.</i> AND BIOG 1500 Investigative Biology Laboratory
<b>Biochemistry</b>	<p><i>Any of the following:</i></p> <ul style="list-style-type: none"> <li>• BIOMG 3310 Principles of Biochemistry: Proteins and Metabolism (<i>offered fall</i>)     AND BIOMG 3320 Principles of Biochemistry: Molecular Biology (<i>offered spring</i>)</li> <li>• BIOMG 3300 Biochemistry, Individualized Instruction (<i>offered fall, spring</i>)</li> <li>• BIOMG 3350 Principles of Biochemistry: Proteins, Metabolism, and Molecular Biology (<i>offered spring</i>)</li> <li>• NS 3200 Introduction to Human Biochemistry (<i>offered fall</i>)</li> <li>• BIOMG 3330 Principles of Biochemistry: Proteins, Metabolism, and Molecular Biology (<i>offered summer</i>)</li> </ul>
<b>Upper-Level Biology</b>	<p><i>Although not required, students find that taking courses in the following areas useful in understanding advanced concepts and providing greater depth of preparation for MCAT exams:</i></p> <ul style="list-style-type: none"> <li>• BIOMG 2800 Genetics Lecture (<i>offered fall, spring, summer</i>)               <ul style="list-style-type: none"> <li>◦ BIOMG 2801 Genetics Lab (<i>offered fall, spring, summer</i>)</li> </ul> </li> <li>• BIOMI 2900 General Microbiology Lectures (<i>offered fall, spring, summer</i>)</li> <li>• NS 3410 Human Anatomy and Physiology (<i>offered spring</i>)               <ul style="list-style-type: none"> <li>◦ NS 3420 Human Anatomy and Physiology Laboratory (<i>offered spring</i>)</li> </ul> </li> </ul> <p><i>Other courses in the areas of cell biology, evolutionary biology, genetics, microbiology, neurobiology, behavior, nutrition, and physiology may be useful. Students are encouraged to consult with a health careers advisor or academic advisor to select courses.</i></p>
<b>General Chemistry</b>	<p>Visit <a href="https://chemistry.cornell.edu/information-majors#premedical-students">https://chemistry.cornell.edu/information-majors#premedical-students</a> for more information on General Chemistry course options. Some options include:</p> <p style="text-align: center;"><b><u>Option 1</u></b></p> CHEM 2070 General Chemistry I ( <i>offered fall, summer</i> ) AND CHEM 2080 General Chemistry II ( <i>offered spring, summer</i> ) <p style="text-align: center;"><b><u>Option 2</u></b></p> CHEM 2150 Honors General and Inorganic Chemistry ( <i>offered fall</i> ) <ul style="list-style-type: none"> <li>◦ Accelerated one-semester course leading directly to organic chemistry</li> <li>◦ An AP score of 5 on Chemistry or instructor permission is required</li> <li>◦ Most medical schools require a full year of general chemistry</li> </ul> <p style="text-align: center;"><b><u>Option 3</u></b></p> <p style="text-align: center;"><i>For Engineering Students Only</i></p> CHEM 2090 Engineering General Chemistry ( <i>offered fall, spring</i> ) AND CHEM 2080 General Chemistry II ( <i>offered spring, summer</i> ) OR CHEM 2150 Honors General and Inorganic Chemistry ( <i>offered fall</i> )
<b>Organic Chemistry</b>	<p style="text-align: center;"><b><u>Option 1</u></b></p> CHEM 3570 Organic Chemistry for the Life Sciences ( <i>offered fall, summer</i> ) AND CHEM 3580 Organic Chemistry for the Life Sciences ( <i>offered spring, summer</i> ) AND CHEM 2510 Introduction to Experimental Organic Chemistry ( <i>offered fall, spring, summer</i> ) <p style="text-align: center;"><b><u>Option 2</u></b></p> CHEM 3590 Honors Organic Chemistry I ( <i>offered spring</i> ) AND CHEM 3600 Honors Organic Chemistry II ( <i>offered fall</i> ) AND CHEM 2510 Introduction to Experimental Organic Chemistry ( <i>offered fall, spring, summer</i> )

<p><b>Organic Chemistry, cont'd.</b></p>	<p style="text-align: center;"><b><u>Option 3</u></b></p> <p>CHEM 3530 Principles of Organic Chemistry (<i>offered fall</i>)  <b>AND</b> CHEM 2510 Introduction to Experimental Organic Chemistry (<i>offered fall, spring, summer</i>)</p> <ul style="list-style-type: none"> <li>○ A single-semester organic chemistry course</li> <li>○ Some medical schools require a full-year of organic chemistry</li> <li>○ Schools that do not require a full-year organic chemistry sequence usually require a one-semester biochemistry course and may also require biochemistry lab.</li> </ul> <p><i>Students are encouraged to explore requirements of medical schools before enrolling in this course.</i></p>
<p><b>English</b></p>	<p>Most medical schools will accept First-Year Writing Seminars (FWS) in fulfillment of their writing requirement; however, writing-intensive courses from other disciplines may also be acceptable. Students are encouraged to check the requirements of specific medical schools as the English requirement varies.</p>
<p><b>Math</b></p>	<p style="text-align: center;"><b><u>Calculus</u></b></p> <ul style="list-style-type: none"> <li>• MATH 1106 Calculus for the Life and Social Sciences (<i>offered spring</i>)</li> <li>• MATH 1110 Calculus I (<i>offered fall, spring, summer</i>)</li> <li>• MATH 1910 Calculus for Engineers (<i>offered fall, spring, summer</i>)</li> </ul> <p style="text-align: center;"><b><u>Statistics</u></b></p> <ul style="list-style-type: none"> <li>• STSCI 2150 Introductory Statistics for Biology (<i>offered fall, spring</i>)</li> <li>• BTRY 3010 Biological Statistics I (<i>offered fall</i>)</li> <li>• MATH 1710 Statistical Theory and Application in the Real World (<i>offered fall, spring</i>)</li> <li>• AEM 2100 Introductory Statistics (<i>offered fall</i>)</li> <li>• ILRST 2100 Introductory Statistics (<i>offered fall, winter, spring, summer</i>)</li> <li>• PSYCH 2500 Statistics and Research Design (<i>offered fall, summer</i>)</li> <li>• ECON 3130 Statistics and Probability (<i>offered fall</i>)</li> <li>• SOC 2010 Evaluating Statistical Evidence (<i>offered fall</i>)</li> <li>• ENGRD 2700 Basic Engineering Probability and Statistics (<i>offered fall, spring, summer</i>)</li> <li>• CEE 3040 Uncertainty Analysis in Engineering (<i>offered fall</i>)</li> <li>• PAM 2100 Introduction to Statistics (<i>offered spring</i>)</li> </ul>
<p><b>General Physics</b></p>	<p style="text-align: center;"><b><u>Option 1</u></b></p> <p style="text-align: center;"><i>Individualized instruction, not calculus-based</i></p> <p>PHYS 1101 General Physics I (<i>offered fall, summer</i>)  <b>AND</b> PHYS 1102 General Physics II (<i>offered spring, summer</i>)</p> <p style="text-align: center;"><b><u>Option 2</u></b></p> <p style="text-align: center;"><i>Calculus-based</i></p> <p>PHYS 2207 Fundamentals of Physics I (<i>offered fall</i>)  <b>AND</b> PHYS 2208 Fundamentals of Physics II (<i>offered spring</i>)</p> <p style="text-align: center;"><b><u>Option 3</u></b></p> <p>PHYS 1112 Physics I: Mechanics &amp; Heat (<i>offered fall, spring, summer</i>)  <b>AND</b> PHYS 2208 Fundamentals of Physics II (<i>offered spring</i>)</p> <p style="text-align: center;"><b><u>Option 4</u></b></p> <p style="text-align: center;"><i>For Engineering Students</i></p> <p>PHYS 1112 Physics I: Mechanics &amp; Heat (<i>offered fall, spring, summer</i>)  <b>AND</b> PHYS 2213 Physics II: Electromagnetism (<i>offered fall, spring, summer</i>)  <b>AND (optional)</b> PHYS 2214 Physics III: Oscillations, Waves, and Quantum Physics (<i>offered fall, spring, summer</i>)</p> <p>* <i>Crossovers between 1101/2208 and 2207/1102 are acceptable.</i></p>
<p><b>Social Science</b></p>	<p>The "Psychological, Social, and Biological Foundations of Behavior" section of the MCAT covers topics taught in social science courses. A student can prepare for this section by taking courses in Sociology, Psychology, Human Development, and Development Sociology. Students are encouraged to consult with a health careers advisor to select courses.</p>

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## AAMC Core Competencies

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The Association of American Medical Colleges (AAMC) has outlined fifteen core competencies that should be demonstrated by entering medical students. These competencies are separated into four categories: Interpersonal, Intrapersonal, Thinking and Reasoning, and Science. It is important for students to understand the competencies and develop the skills and knowledge necessary to demonstrate fluency in these areas. For detailed descriptions of the competencies, see the AAMC Admissions Initiative at: <https://www.aamc.org/services/admissions-lifecycle/competencies-entering-medical-students..>

- **Interpersonal**
  - Service Orientation
  - Social Skills
  - Cultural Competence
  - Teamwork
  - Oral Communication
- **Intrapersonal**
  - Ethical Responsibility to Self and Others
  - Reliability and Dependability
  - Resilience and Adaptability
  - Capacity for Improvement
- **Thinking and Reasoning**
  - Critical Thinking
  - Quantitative Reasoning
  - Scientific Inquiry
  - Written Communication
- **Science**
  - Living Systems
  - Human Behavior

Academics are obviously an important part of medical school applications; however, these competencies demonstrate that there are many areas that need to be addressed. There are an infinite number of ways to demonstrate competencies in the outlined areas. Students should carefully consider both academic and extracurricular activities to determine how best to dedicate time to activities that are both interesting and meaningful.

## Application Components

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As a student who is thinking about applying to health professions school, you have probably wondered how your credentials compare with the “ideal student” that you’ve imagined or heard about through the student grapevine. Although you want a realistic appraisal of your chances for acceptance, a definitive answer is impossible. Even a generalized answer is difficult, given that there are many medical and dental schools in the United States and each has its own admissions committee with its own standards. These variables make it hard to define one set of standards that apply in all schools. Almost all schools consider the following six factors when reviewing applicants:

- Academic Record
- Standardized Admissions Exam (MCAT, DAT)
- Standardized Application (AMCAS, AACOMAS, TMDSAS, AADSAS, etc.)
- Experience (clinical and service)
- Letters of Evaluation and/or Recommendation
- Interview

The primary factors considered are your grade point average (GPA) and standardized admissions exam score. However, items in each factor contribute in much the same way that individual pieces of a jigsaw puzzle comprise a complete picture. Usually no *one* piece of information alone is sufficient to determine your chances; instead, view the process as one where you contribute the best "pieces," so that the committee can come up with the best "picture" of your achievement and potential. Admissions committee members may consider the following factors when reviewing your credentials:

- Academic record
  - The overall GPA
  - The science and math GPA (also known as the biology, chemistry, physics and math, or BCPM, GPA)
  - The grades in courses required for medical or dental school
  - The pattern of academic achievement
    - Is there an upward or downward trend?
  - Balance between science and liberal arts courses
  - The academic quality of the institution where courses were taken
  - Experience in credit-bearing research, service learning, or teaching
  - External factors that might account for poor performance
- Standardized admission tests (MCAT, DAT, OAT)
  - The percentile ranking
  - A low score on one section of the test
  - Consistency of the scores with the GPA
  - Additional test scores

Standardized test scores aim to provide a nationwide "level playing field" for comparing student achievement. Cornell students' scores well exceed the national averages, due to the excellence of the curriculum and their hard work. Students should schedule standardized tests after all prerequisites are completed and after there has been time for a solid review of the topics to be tested and preparation for the test. The test can be scheduled in either the junior or senior year or beyond, but should be done before applying to professional schools.

While grades and standardized test scores are not everything, they are extremely important in the admissions process. A medical school may have five thousand applicants to fill a class of one hundred students. In order to determine whom to select for an interview, the members of the admissions committee may choose eight hundred candidates. They will frequently choose those with strong academic records and test scores. From this pool of hundreds, they are able to find applicants who have, in addition to "high" numbers, the personal qualities and competencies that are likely to enable them to become compassionate and highly skillful healthcare professionals.

- Experience
  - Working or volunteering in a clinical setting
    - What have you learned from your interaction with patients?
    - How have your experiences helped you gain a realistic picture of a particular health career?
    - Have you worked while attending college? In the summer? How much?
    - Has working affected the time available to devote to studies and extracurricular activities?
  - Service experiences
    - How have you developed your commitment to help others?
    - What have you done to become aware of the needs of people unlike yourself?
  - Balance between participation in activities and maintenance of academic performance
  - Leadership roles
  - Teamwork
  - Demonstration of a sustained commitment
  - Participation in a range of activities
    - Have you stepped out of your "comfort zone"?
  - Research experience
    - *If you plan to pursue a dual MD/PhD degree, research is required.*

- Have you published a scholarly journal article or presented a poster?

Of particular interest to committee members is the *quality* of the activities in which you have participated, *what you learned* from them, and the pattern of your experience. Are your activities isolated events or do they show growing understanding and commitment? Those who read your medical school application are mainly doctors and scientists. They expect you to run sufficient experiments to prove the hypothesis that you want to be a doctor. To that end, shadowing is useful, but your healthcare experience *should not* be limited to shadowing.

Experience with patients should be viewed as required. Beyond that you should pursue other interests, including those unrelated to healthcare. You do not need to have experience in all of these areas; nor can you turn to a magical formula for combining activities to create a successful application. Admissions committee members are experienced in their work and can detect false or inflated credentials. They prefer a genuine person who has pursued interesting activities that have helped to define career goals.

- Letters of evaluation and/or recommendations
  - Academic and intellectual abilities
  - Motivation
  - Personal attributes that mirror those of a physician/dentist

Your letters of recommendation reveal how recommenders, who are experienced in teaching and working with students, view you and your qualifications for medical or dental school. Letters from professors will also be able to discuss you in the Cornell context and demonstrate that you know how to build relationships. Medical schools value this capacity. To be sure you will have strong letters of recommendation, take the initiative to get to know professors, supervisors, physicians, etc. beginning in your first year. It is essential that those who write your letters of recommendation *know you well* and can provide insight into your personal character.

See “laying the groundwork for strong letters of recommendation” in this Guide.

- The application
  - Timeliness of submission
  - Information in personal statement
    - Does a distinct, unique individual emerge?
  - Proper spelling, grammar, and organization
  - The state of residence
  - Other aspects of the application that should be taken into account, such as ethnic, geographic, racial, and socioeconomic factors
- The interview
  - Communication and interpersonal skills
  - Personality
  - Politeness
  - Adequate greeting, eye contact, ability to converse
  - Clarification of application
  - Weaknesses in the application

An admissions committee uses the interview to complement what you present in your application. After the interview, the school’s admissions committee has a fuller picture, which it uses to compare you with others in the pool of candidates from which it ultimately makes its choice. Naturally, this process is not perfect; but at most medical schools, it seems to be administered with a great deal of concern for applicants.

There are many variables in the six admission factors, just as there are many variables in the opinions of the members of the admissions committees at the schools to which a student applies. Therefore, the choice of candidates is not totally predictable,



nor is it totally unpredictable. Within wide parameters, it is possible for you to review your credentials and find at least a tentative answer to the question, "Are my credentials competitive to apply to medical school?" You can also further explore this question with a health careers advisor and plan steps to strengthen your credentials.

## Your Conduct and Credit Rating

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The American Medical College Application Service (AMCAS), used by the majority of MD-granting medical schools in the United States, includes this question on its application:

"Were you ever the recipient of any institutional action by any college or medical school for unacceptable academic performance or conduct violation, even though such action may not have interrupted your enrollment or required you to withdraw? You must answer 'yes' even if the action does not appear on, or has been deleted from your official transcripts due to institutional policy or personal petition."

Many medical schools also conduct criminal background checks. Trustworthiness and good judgment are essential qualities for someone who seeks to enter a health profession. Be aware that actions that reflect negatively on your character, judgment, or honesty may seriously diminish your chances of admission to a health professions school. Also, most applicants must borrow to pay for medical school. To secure loans, you will need to have a good credit rating. Debts other than long-term educational debts (e.g. credit card debt, car loans and other unpaid bills) must be responsibly repaid before entering medical school. Medical schools have rescinded an acceptance when a student's credit rating was poor or if they did not disclose an institutional action.

## Year-By-Year Timelines

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All pre-health students are encouraged to use the materials in the Career Library, 103 Barnes Hall, and online to determine specific requirements for course work, standardized tests, and application procedures. The following timelines provide general guidelines for most health careers, with specific references to medicine and dentistry.

Throughout your undergraduate career:

- Plan your course schedule in consultation with an academic advisor.
- Attend programs featuring professional school admissions speakers, practitioners, and others.
- Check out student health career organizations, volunteer and research opportunities, summer jobs, and internships to test and develop your career interests.
- Develop and frequently update an alternative career option to pursue if you don't go to a health professional school and/or how to plan your gap/growth/bridge/development year(s) as applicable.

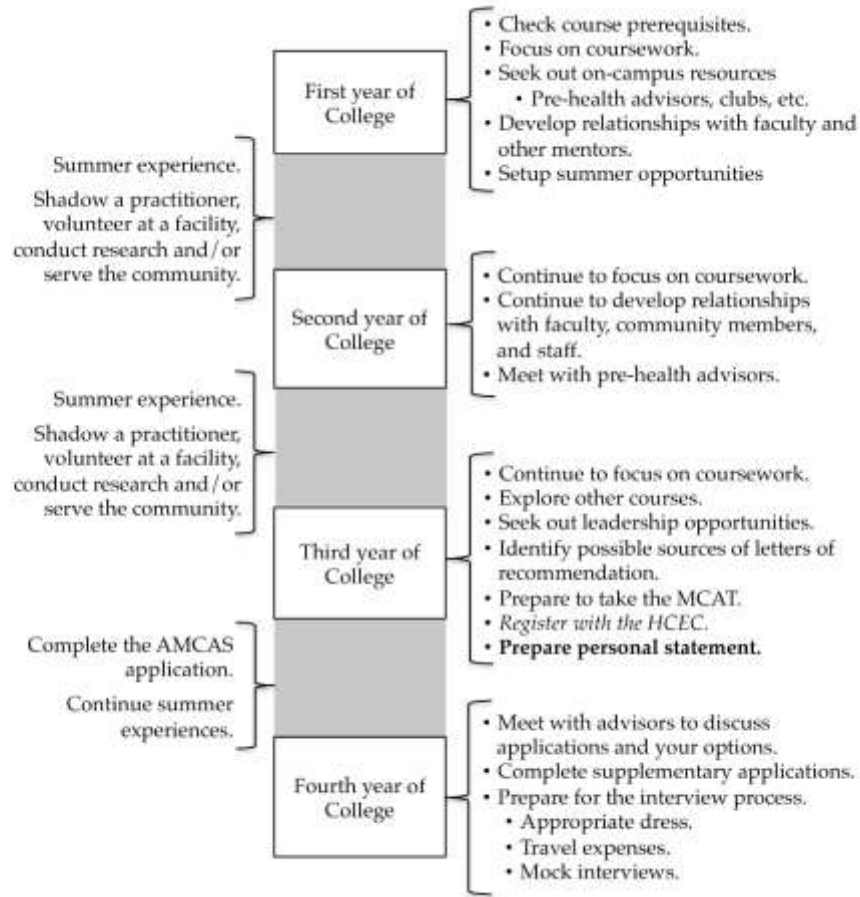
The specific path a student takes through the undergraduate career to matriculation into professional school is varied. The pathway that may seem "traditional," in which students graduate from Cornell in the spring and matriculate in medical school in the following fall, usually requires applications in the summer preceding the fourth year of college. This pathway "straight-through" to medical school was more common in previous generations of medical students, but is followed by less than half of national applicants and less than 15% Cornell students now. It is currently more common (~85%) for students to take one or more "gap/bridge" year(s) after graduation from Cornell and follow a different timeline.

A student who wishes to follow the "straight-through" timeline should consider how timing affects various components of the application. As all students know, GPA is a major factor in reviewing the academic credentials of a potential medical student. The GPA that a student presents to admissions committees includes all college-level academic work up to the date of application. On the "straight-through" pathway, this usually includes the six semesters preceding an application. If a student has a more challenging semester during the first or second year, these grades will be over-represented in the GPA in comparison to a similar situation for students following the "gap/bridge" year pathway. Students will also have to complete pre-requisite courses in six semesters if following the "straight-through" timeline, as opposed to eight or more semesters if following the "gap/bridge" year timeline.

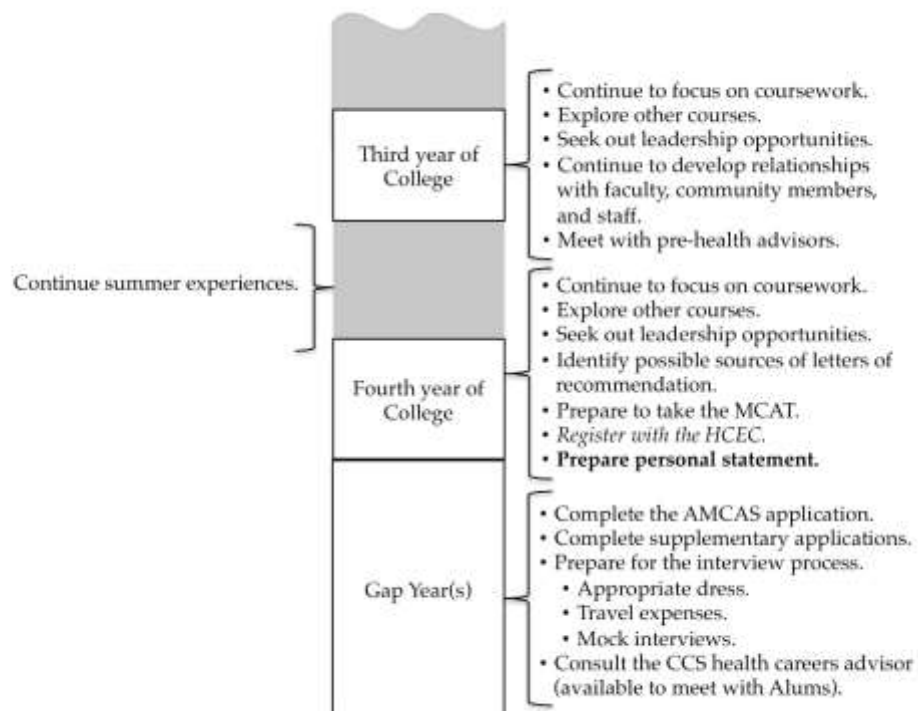
Students must also be aware that medical school applications must be able to demonstrate their commitment to medicine through community service and clinical opportunities. Students who apply to medical schools in their senior year or after graduation have the opportunity for more time to develop meaningful and varied experiences. Students who intend to apply in the summer of the

junior year must gain this experience during the six semesters, including breaks, and two summers of the preceding two years. Because high school experiences are not included in application materials, it can be difficult to obtain high-quality experiences in this amount of time, particularly if students make the decision to apply to medical school later in their undergraduate career.

**“Straight-through” Timeline – Application after Third Year of College (Less Common)**



**One Gap/Bridge Year Timeline – Application after Fourth Year of College (More Common)**



## Laying the Groundwork for Strong Letters of Recommendation

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Health professions schools use quantifiable information such as grades and standardized test scores in the admissions process, but they also want to know if you are the kind of person who will become a good health care professional. The Cornell Health Careers Evaluation Committee (HCEC) is available to write a letter of evaluation to help schools learn about your qualitative aspects such as motivation, intellectual and interpersonal skills, and academic performance. This process requires you to get letters of recommendation. **These letters should come mainly from Cornell faculty and staff.** To have strong letters written on your behalf, you need to build contacts and relationships with the people who teach, advise, supervise, and mentor you. You will get the full benefit of your Cornell education and enjoy it more as you take the initiative to get to know these people.

Your professors should be the key source of letters, though letters may also come from employment or volunteer supervisors, mentors, research or club advisors, and coaches, among others. Do not let large classes deter you from forming relationships with professors. To do this, you should make use of faculty office hours and invest time in talking with and getting to know your instructors, beginning in your first year. You should also discuss goals, interests, and your plan to become a health care professional with professors or others you think would write strong letters of recommendation. Department gatherings and talks can be a good way to get to know professors outside of class. You should also make sure to keep in touch with professors after you are out of their courses. Before obtaining a letter of recommendation, always ask your recommender if they are able to write a supportive letter on your behalf.

Students should keep records of semester grades, awards, selected assignments, papers, and tests with teacher comments. These details can be difficult to recall after two or three years have passed. In addition to reflections on experiences, students should record addresses, phone numbers, and e-mail addresses of employers, supervisors, and physicians that they have worked with or shadowed. This information and material will then be available for you and your recommenders to consult.

### Health Careers Advisors

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#### Cornell Career Services:

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#### College of Arts and Sciences:

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## College of Agriculture and Life Sciences:

CALS Career Services

Pre-Med Advisors: Jennifer DeRosa, Steve Shaum, and Laurie Gillespie

140 Roberts Hall

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<http://cornell1.force.com/cu/s/appointments>

## College of Engineering:

Benjamin E. Martin

Assistant Director of Engineering Advising

180 Rhodes Hall

Phone: 607.255.7414

## College of Veterinary Medicine:

Jennifer Mailey

Director, Admissions

S2009 Schurman Hall

Phone 607.253.3702

E-mail: [jam333@cornell.edu](mailto:jam333@cornell.edu)

## Investigating Careers - Resources Available in the Career Library

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Complete Guide to the MD/PhD Degree	H085
Foundations of Osteopathic Medicine, 3 <sup>rd</sup> Ed.	H181
Exploring Health Care Careers	H137a, b
Healthcare Management Education Directory of Programs	H077
Health Care Careers Directory	H025
Nursing Programs	H097
ADEA Official Guide to Dental Schools	H090
Opportunities in Physician Assistant Careers	H210
Pharmacy School Admission Requirements	H105
Practical Guide to Global Health Service	H138

## Wider Reading

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- A Surgeon's Story: The Autobiography of Robert T. Morris*, Roger Godsen and Pam Walker
- Anatomy of an Illness as Perceived by the Patient*, Norman Cousins
- Another Day in the Frontal Lobe*, Katrina Firlik
- Becoming a Doctor: From Student to Specialist, Doctor-Writers Share Their Experiences*, Lee Gutkind, Ed.
- Being Mortal*, Atul Gawande
- Black Man in a White Coat*, Damon Tweedy
- Blood: An Epic History of Medicine and Commerce*, Douglas Starr
- Caring for the Country: Family Doctors in Small Rural Towns*, Howard K. Rabinowitz
- Classic Cases in Medical Ethics: Accounts of Cases that Have Shaped Medical Ethics with Philosophical, Legal, and Historical Background*, Gregory E. Pence
- Darkness Visible: A Memoir of Madness*, William Styron
- Deadly Dust: Silicosis and the Politics of Occupational Disease in Twentieth Century America*, Gerald Markowitz and David Rosner
- Final Exam: A Surgeon's Reflections on Mortality*, Pauline W. Chen
- Get Me Out: A History of Childbirth from the Garden of Eden to the Sperm Bank*, Randi Hutter Epstein
- How Doctors Think*, Jerome Groopman
- Medical Marriages: Sustaining Healthy Relationships for Physicians and Their Families*, Wayne M. Sotile and Mary O. Sotile
- Mountains Beyond Mountains: Dr. Paul Farmer, a Man Who Would Cure the World*, Tracy Kidder
- Never Say Die*, Susan Jacoby
- Nursing Against the Odds*, Suzanne Gordon
- Oath Betrayed: Torture, Medical Complicity, and the War on Terror*, Steven H. Miles
- Out of My Life and Thought*, Albert Schweitzer
- Shock: The Healing Power of Electroconvulsive Therapy*, Kitty Dukakis and Larry Tye
- Teeth: Beauty, Inequality, and the Struggle for Oral Health in America*, Mary Otto
- The Edge of Medicine: The Technology That Will Change Our Lives*, William Hanson
- The Emperor of all Maladies: A Biography of Cancer*, Siddhartha Mukherjee
- The Ghost Map: The Story of London's Most Terrifying Epidemic*, Steven Johnson
- The Healing of America: A Global Quest for Better, Cheaper and Fairer Health Care*, T.R. Reid
- The Immortal Life of Henrietta Lacks*, Rebecca Skloot
- The Soul of Medicine: Tales from the Bedside*, Sherwin Nuland
- Yale Guide to Careers in Medicine & the Health Professions*



# **Cornell Career Services**

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