Dear PreHealth Student,

Welcome to the PreHealth program in the College of Arts & Sciences. The goal of our team is to enable your success in identifying and attaining the health-related career that is right for you. The following pages have information that will help you pursue a broad liberal arts education while at the same time identify and focus the coursework and activities necessary to achieve your professional goals.

If you have not yet registered as a prehealth student through our listserv, please e-mail, prehealth@artsci.wustl.edu so that you receive important updates and announcements from our team. Visit our website at: http://prehealth.wustl.edu for a full list of resources available to you as well as our contact information and postings for events on campus relevant to your interests.

We hope that you will take advantage of all the services our team has to offer and look forward to getting to know you.

Sincerely,

The Pre-Health Team:

Shawn Cummings, University College, January Hall
Warren Davis, College Office
Matt DeVoll, PhD, College Office
Joan Downey, MD, MPH
Elizabeth Heidger, Prehealth Coordinator, College Office
Harvey Fields, PhD, Assistant Director of Academic Programs, Cornerstone
Elizabeth Fogt, University College, January Hall
Nicole Gore, JD, College Office
Carolyn Herman, EdD, College Office
Joy Kiefer, PhD, Office of Undergraduate Research
Kathy Kniepmann, OT, MPH
Ron Laue, PhD, School of Engineering
Carol Moakley, MSW, Career Center
Robert Patterson, PhD, Cornerstone
Michaele Penkoske, MD, Career Center
Greg Polites, MD, Medical School
Jennifer Romney, College Office
James E. Segrist, M.D., M.B.A, Career Center
Clarissa Smith, PT, Career Center
Kristin Sobotka, Office of Undergraduate Research
Wilmetta Toliver-Diallo, PhD, College Office
# Table of Contents

**Pre-Health Program Welcome** ................................................................. 2

**Making Decisions**
- An Overview ........................................................................................................... 4
- Your Time as an Undergraduate .............................................................................. 5

**Academics**
- Your Major ............................................................................................................. 6
- Planning Your Courses ............................................................................................ 6
- Preparation for Standardized Tests ......................................................................... 8
- Timelines for Coursework ....................................................................................... 8
- Post-Baccalaureate Programs ................................................................................ 9
- Institutional Actions ................................................................................................ 9
- Letters of Recommendation ................................................................................... 10

**Skill Development & Career Exploration**
- Leadership .............................................................................................................. 13
- Career Exploration .................................................................................................. 13
- Community Service .................................................................................................. 13
- Clinical Exposure .................................................................................................... 14
- Research ................................................................................................................... 15
- Study Abroad .......................................................................................................... 16
- Summer Options ..................................................................................................... 17

**Applying to Health Professional School through Arts & Sciences** .................... 18

**PreHealth Advising Contact Information** .......................................................... 19

---

**Appendices (available online)**

**Appendix A:** MCAT and BCPM GPA Grid................................................................. 21
**Appendix B:** Health Care Spans Many Career Opportunities ............................... 22
- Athletic Training, Audiology, Dentistry, Healthcare Administration, MD/DO, MD/PhD, Nursing, Occupational Therapy, Optometry, Pharmacy, Ph.D. Programs, Physical Therapy, Physician Assistant, Podiatry, Public Health, Social Work, and Veterinary Medicine.

**Appendix C:** Attaining Academic Success.................................................................. 57

**Appendix D:** Major Programs for Students interested in Medicine, Dentistry, ...... 58
- and Veterinary Medicine

**Appendix E:** Timeline for Applying to MD/MD-PhD Programs................................. 59

**Appendix F:** Course Planning for Pre-Meds ............................................................... 62

**Appendix G:** Science Course Outside of BCPM Departments ................................ 63

**Appendix H:** Medical Schools Policy Variations Regarding Math Requirements .. 64

**Appendix I:** Medical Schools that Require Biochemistry for Matriculation........... 64

**Appendix J:** Medical Schools that Require More than 1 year of Biology ............... 65

**Appendix K:** Medical Schools that Require a Written Thesis for Graduation........... 66

**Appendix L:** Applying to Health Professional School through Arts & Sciences..... 67
  - Pre-Health Letters & Personal Information Review (PIR) System
Over the next four years, you have the opportunity to acquire a broad liberal arts education, and to determine what graduate education and work you will pursue after Washington University. Health care is an exciting and varied field – while some students will decide that direct patient care is the perfect fit for them, others will make landmark contributions through biomedical research careers, and still others will be drawn to care for populations through public health, public policy work, and health care administration. Direct patient care encompasses an exciting array of careers serving the different needs of patients in varied clinical settings.

The more courses you take and the more co-curricular experiences you acquire, the more information you will have to inform your decision. The following diagram gives a sample of the paths available to you:
Will you develop cures for disease, treat patients, develop health care policy, start a clinic across the globe, or will your career span more than one of these options? Evaluate your long-term goals and consider these possibilities as you plan your time as an undergraduate.

- If you think you want to conduct **biomedical research** to understand disease mechanisms and **develop cures**:

<table>
<thead>
<tr>
<th>Your Major</th>
<th>One of the sciences</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year courses</td>
<td>Consider enrolling in calculus and chemistry or physics</td>
</tr>
<tr>
<td>Extracurriculars</td>
<td>Make contact with the Undergraduate Research Office and get some experience in the laboratory before your junior year in college</td>
</tr>
<tr>
<td>After graduation</td>
<td>PhD or MD/PhD Program</td>
</tr>
</tbody>
</table>

- If you think you want to shape national or international **health policy**, or make contributions to the **health of an entire community** rather than trying to treat one patient at a time:

<table>
<thead>
<tr>
<th>Your Major</th>
<th>Consider the public health, health economics, and health care management courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year courses</td>
<td>There is no specific course sequence.</td>
</tr>
<tr>
<td>Extracurriculars</td>
<td>Utilize the Career Center to look for internships in your sophomore and junior summer to help you narrow your focus and eventually choose a work setting.</td>
</tr>
<tr>
<td>After graduation</td>
<td>Master’s degree in public health, public policy or health care administration</td>
</tr>
</tbody>
</table>

- If you think you want to **work one-on-one with individual patients**:

<table>
<thead>
<tr>
<th>Your Major</th>
<th>You can pursue any major as long as you fulfill the requirements for your intended professional school/program</th>
</tr>
</thead>
<tbody>
<tr>
<td>First year courses</td>
<td>More detailed information about prerequisites for diverse professional programs can be found in Appendix B: Health Care Career Opportunities, available online.</td>
</tr>
<tr>
<td>Extracurriculars</td>
<td>Consider community, clinical, and/or public service. Both exposure to the field and commitment to service are key for choosing your ultimate career and for admission to professional school.</td>
</tr>
<tr>
<td>After graduation</td>
<td>Professional training program*</td>
</tr>
</tbody>
</table>

*You should explore several health care practice settings to see what kind of patients would be the most rewarding for you to work with. These include, but are not limited to, medicine, dentistry, physical therapy, occupational therapy, pharmacy, veterinary medicine, optometry, and social work.*
Academics

Your Major
Research scientists and physician-scientists should major in a science in preparation for a PhD or MD/PhD program.
Other professional programs welcome students with any major. Choose your major because you find the coursework engaging and exciting, not because you think it will impress a professional school. You are far more likely to end up with strong grades in courses you love! See Appendix D (available online).

Planning Your Courses
- Professional program requirements can be completed alongside any major.
- Do not overload with too many courses too early.
- Keep in mind that certain courses have prerequisites or should be taken in sequence (hence the importance of planning).
- Don’t assume your program accepts AP scores in lieu of college coursework.
- Prerequisites should not be taken Pass/Fail.
- Prerequisites should not be taken abroad

Pre-professional requirements can be completed alongside any major. Requirements must be completed before matriculation but not necessarily before application. Do not overload with too many courses too early. College-level science courses can be unexpectedly time-consuming and demanding. For first-year students, start slowly and move into a more demanding schedule after a year – when you know exactly how much you can do. Two science courses (including math) each semester during your first year is probably enough.

In general, the required core science courses should be completed prior to the taking your pre-professional entrance examination (MCAT, DAT, GRE). Many students take the exam in the spring of their Junior year. It is common to be enrolled in second semester Physics in the semester that you are taking the MCAT or DAT. These exams are offered frequently.

As you plan your schedule, remember that calculus is a co-requisite for physics and that you must begin the chemistry sequence before the biology sequence.

Take stock of whether you are enjoying the ideas in your science coursework. Almost half of the health care fields we list in the chart a few pages back do NOT require advanced coursework in chemistry or biology. A graduate program based on prerequisite courses you truly enjoy may be a better choice!

Advanced Placement
For most medical schools, Advanced Placement (AP) tests in biology, chemistry, and physics do not fulfill the premedical requirements in these areas. Our advice is NOT to skip any required core courses, even if you could receive AP credit for them. AP Credit IS sufficient for the math requirement of many programs. Be sure to consult the individual programs you are interested in.

Pass/Fail
Required courses should never be taken pass/fail. It is acceptable, however, to take a few other courses pass/fail.

Summer School
Washington University summer school courses count for credit toward your degree and toward your professional school prerequisites. However, you can also take requirements elsewhere during the summer. You do not need to get Washington University credit for a course to use it for professional school admissions, but many summer courses will transfer to WU. It is important that you do not split sequential courses between institutions. Consult a prehealth advisor if you are considering more than a few courses at another institution.
Study Abroad
Prerequisites should not be taken during study abroad. For instance, most medical schools will not accept premedical requirements taken at a foreign institution. However, students are encouraged to enroll in other courses abroad and to pursue international research and internships.

Grade Point Average
A GPA of at least 3.5 at time of application should put you in a strong position. Many students have lower grades early in college, build a consistent upward trend, and are very competitive by the time they are applying in the junior or senior year. It is very important that you do well in both science and nonscience courses as an undergraduate student. Specific application statistics for medical school by GPA are compiled in Appendix A. You will notice that a science (also known as the BCPM) GPA below 3.0 reduces your chances of admission quite a bit. While we do not have enough data to compile statistics for other programs, it is safe to assume that all health care professions expect excellent work in both the specific prerequisite classes they demand, and the entire curriculum you choose.

Coursework
Requirements for entry into a specific program may vary, and students are urged to check individual schools, but common requirements for medicine, dentistry and veterinary medicine are listed below. Coursework required for other health care fields will be different.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Coursework Required</th>
<th>Washington University Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>Two semesters with laboratory</td>
<td>Bio I and Bio II  Note: Many med schools require or strongly prefer advanced coursework in addition to Bio I and II, but which specific courses they recommend varies widely.</td>
</tr>
<tr>
<td>General Chemistry</td>
<td>Two semesters with laboratory</td>
<td>Chem 111A + 151 (lab) and Chem 112A + 152 (lab)</td>
</tr>
<tr>
<td>Organic Chemistry</td>
<td>Two semesters with laboratory</td>
<td>Chem 261 and 262</td>
</tr>
<tr>
<td>Mathematics</td>
<td>College Math, to include proficiency in basic statistics. Note: This requirement varies from school to school. For the broadest range of schools, students should complete Calculus II. Some schools have no formal math requirement.</td>
<td>Credit for Math 131, 132 (AP usually ok) Statistics recommended, AP credit ok</td>
</tr>
<tr>
<td>Physics</td>
<td>Two semesters with laboratory</td>
<td>Phys 117A and 118A or Phys 197 and 198</td>
</tr>
<tr>
<td>English</td>
<td>Two semesters, one of composition</td>
<td>Writing I and a second English course Note: Some schools accept any writing-intensive course as the second English course; a few insist on two English composition courses. Your English requirement does not need to be completed before you apply, just prior to matriculation.</td>
</tr>
</tbody>
</table>
Preparation for Standardized Tests

- Consult your advisor to determine exam timing.
- STUDY EXTENSIVELY – pre-professional exams are an important part of your application
- Obtain practice tests
  - MCAT - https://www.aamc.org/students/applying/mcat/preparing/85158/orderingpracticetests_mcat.html
  - GRE - http://www.ets.org/gre/
- Consider enrolling in a review course. Cornerstone offers Washington University’s own MCAT preparation course. The fee is less than half the cost of comparable third party offerings and can be charged to your student account. Instruction is provided by MD/PhD candidates from the Washington University School of Medicine. For more information, visit http://cornerstone.wustl.edu/AcademicPrograms/IntensivePrograms/MCATPreparation.aspx or contact Dr. Rob Patterson at rhpatter@wustl.edu

Most professional programs give considerable weight to some type of pre-professional entrance exam such as the MCAT, DAT or GRE in their admissions decisions. As Wash-U science courses are not designed specifically for the MCAT (or the DAT or the GRE), there may be some topics which are included on standardized tests but not covered in your science courses. The specific content covered on a test will be described in detail by the organization that designs and administers the test. Depending on your background, you may find it necessary to learn certain concepts on your own or through a review course. You should study extensively for the exam. Practice tests and other preparation materials are available from the organizations that sponsor the examinations.

Exam timing varies by program: many students take the MCAT in the spring of the junior year, but students usually sit for the GRE in the beginning of the senior year. The prehealth advisors are happy to discuss the optimum time for you to take an entrance exam.

Timelines for Coursework

Students begin coursework for graduate programs in the health professions at a wide variety of times. While common options are described below, individual variations on these themes are possible and may better allow you to achieve all of your academic and personal goals. Talk to a prehealth advisor to customize any of these options! See online handbook Appendix F for course sequence outlines.

Beginning in the Freshman Year

Students who plan to pursue a science intensive health graduate program (for example, medicine, physician-scientist, or veterinary medicine) often begin with either chemistry or physics in the first year of college. If they are majoring in a science and don’t have AP credit for calculus II, they will also complete calculus II sometime in the first two years. Students who complete two years of chemistry, a year of physics and four semesters of biology by the end of the Junior year may choose to take their standardized exam in the spring of the Junior year, apply the summer after the junior year, and enter their graduate program directly after graduation from WU.

About half of our students either choose to spread the coursework out more, or take additional time to prepare for an entrance exam. These students apply the summer after the senior year, and work during their “gap year” while they are interviewing for professional school. Many students who opt for the gap year report that they wanted to create time to study abroad, or gain more experience outside the classroom in clinical settings, before they applied.

Beginning in the Sophomore Year

Students who do not expect to major in the sciences may want to delay enrolling in time and credit-intensive laboratory science sequences until after they have had a chance to explore a major. Students who start chemistry in the sophomore year can complete at WU all the requirements for science-intensive health professional graduate programs like medicine and veterinary medicine. These students can apply the summer after their Junior year, but are likely to take a gap year.

Beginning in the Junior (or Senior) Year
Some students become interested in a health profession later in college. Coursework for many health fields can be completed in two years, but students who start coursework for medicine, dentistry or veterinary medicine in the junior year will probably complete some coursework at another university after graduation from Washington University. We are pleased to help alumni apply to professional programs, whether or not the bulk of their pre-professional coursework was completed at Washington University.

**Post-Baccalaureate Programs**

Many Wash-U students do not complete or even begin taking pre-professional courses while enrolled as undergraduates. Post-baccalaureate programs allow college graduates to take one or all of the required courses. WU students who choose to complete their requirements after graduation can still take advantage of our pre-health advising and resources.

Some post-bac programs cater to career changers (those who need to complete most or all of the science core), some to enhancers (students who have completed the core but are taking advanced science electives to improve their science GPA and/or prepare for the MCAT), and some accept both. The post-baccalaureate premedical studies program at Wash U, housed in University College, accepts both types of students. The program allows students to take day or evening courses and provides access to premed resources and advising. For more information, please see [http://ucollege.wustl.edu/areas/special_programs/premed](http://ucollege.wustl.edu/areas/special_programs/premed), email pbpm@wustl.edu, or call 314 935-6700 to schedule an appointment with a post-bac advisor. For the full list of post-bac programs available nationally, see [http://services.aamc.org/postbac/](http://services.aamc.org/postbac/).

**Institutional Actions**

Most professional schools have an application question like the one found on the American Association of Medical Colleges Application Service (AMCAS): "Were you ever the recipient of any institutional action by any college or medical school for unacceptable academic performance or conduct violation?"

The AMCAS help states:"You must answer Yes to this question if you were ever the recipient of any institutional action resulting from unacceptable academic performance or a conduct violation, even if such action did not interrupt your enrollment or require 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."

Obviously you want to maintain the highest ethical standards as well as have satisfactory academic progress each semester, so that you do not have to ever mark "Yes" to this question.

Academic actions, such as probation for a semester, are considered institutional actions. They are easily explained; the information leading to the action is already a part of your transcript. In fact, if you did struggle academically at some point to the extent that you received an academic action, this question gives you the opportunity to talk about your growth as a student since then.

Conduct violations, including academic integrity violations, are potentially a more serious matter. Give thought to what you've learned from the experience. Medical schools understand that many individuals learn from the past and emerge stronger as a result. If you are unsure whether you have a conduct violation, you should check with Tamara King, our University Judicial Officer. The sooner you have an accurate picture of your record, the better.

Since the prehealth advising office will have to complete Dean’s Certification forms for some of the programs to which you may apply, it is also important for our office to have a clear picture of your record and what you have learned from the experience. Please disclose all infractions, either to your
Note: Be sure to disclose everything, on and off campus! A written ticket or citation might show up on a criminal background check, regardless of the outcome or what your lawyer tells you should be reported. You want to inform medical schools up front; they do not like surprises.

Applicants who become the subject of an institutional action after certifying and submitting the AMCAS application must inform their designated medical school(s) within 10 business days of the date of the occurrence. WUSM specifies: I agree to report to the [WUSM] Registrar all institutional judicial or academic sanctions and/or legal actions in which I have been a party prior to my matriculation or during my enrollment at the School of Medicine. I further agree to report all institutional judicial and academic charges and/or legal charges brought against me before my matriculation or during my enrollment at the School of Medicine.

Letters of Recommendation

- Letters are a cornerstone of your application portfolio
- Build a relationship with faculty, mentors and practitioners from the beginning of your undergraduate career
- Some schools require your recommenders to teach science courses – attend help-sessions and office hours, introduce yourself, build a rapport, join a research lab
- Some schools require recommendations from practitioners – seek out clinical experiences, volunteer programs, and mentors
- You need separate recommendations for professional and graduate school. Be clear about what type of program you are applying to
- Request letters skillfully – be considerate and cordial

Recommendations from Science Faculty

Many medical, dental and veterinary schools insist that two of your recommenders be science faculty. If your major is one of the sciences, you should cultivate a good relationship with your advisor and at least one other science faculty member. One way to develop a strong relationship with a faculty member is to work in his or her research lab. The longer the period of ongoing association between you and your recommender, the stronger the recommendation can be.

Some strategies that non-science majors can adopt to lay the groundwork for asking for letters of reference in science include:

- Take upper-level science coursework. If you particularly enjoyed an instructor for an introductory course in which you did well, try to take an additional course with the same instructor. Go regularly to the professor’s help-sessions and office hours, and bring questions about the course material or very closely related subjects with you.
- Ask your advisor to write for you if he or she teaches you in a science course. They will have the advantage of knowing you both as an advisee and as a science student.
- Consider joining a science research lab, either on campus or at the medical school. If you take Bio 200 (or the equivalent in another department), it is clear that your research mentor is also one of your instructors. This may turn out to be more fun and more interesting than upper-level coursework in an area which you are not enthusiastic about. Note: A few schools do not accept letters from lab mentors in lieu of a recommender who has taught you in a classroom setting.

Recommendations from Practitioners

Many students receive outstanding letters from practitioners of their chosen profession, and some schools (e.g., dentistry, veterinary medicine, and osteopathic medicine) may insist that you have
a letter from a practitioner. If you start shadowing a practitioner early in your undergraduate career and continue periodically observing that same person until you apply to professional school, you are in an excellent position to receive a letter from someone who has known you for several years and has seen you mature both intellectually and socially, as well as in terms of career goals. Practitioners associated with volunteer programs in which you are involved over a significant period of time are also a good source of meaningful letters of recommendation.

Requesting Letters of Recommendation
Request letters skillfully and listen carefully to your potential referees’ responses.
Remember:

- **Be considerate.** Make your request far enough in advance that the recommender will have plenty of time (at least four weeks) to fulfill it. Make an appointment to see your mentor; a phone conversation may have to suffice for out-of-town requests.

- **Think about how to phrase your request.** It is far better to say, “Are you comfortable writing a letter to support my application?” than to say, “Will you please write a letter of recommendation for me?” If you hear, “I would be happy to write the letter, but I don’t know your work that well,” or “Yes, but you would probably receive a better letter from someone who has known you longer,” thank the person for his or her honesty, and seek a recommendation elsewhere.

- **Be cordial.** Acknowledge that the instructor’s time is limited, and communicate that you deeply appreciate his or her willingness to write on your behalf. Once your letter has been received in the College Office, please write a thank-you note to the person who wrote the letter. Not only is this common courtesy, but it will also create enormous good will for students who follow you. Consider writing another thank-you when you are accepted. Your professors are interested in what happens to the students they recommend.

Once you make your polite and timely ask, help your letter writer help you by setting up a face-to-face meeting in which you bring them everything they need to write you a strong and personalized letter. These would include:

1. Your unofficial transcript printed from WebStac. Highlight for the faculty person the most important classes for the application for which you seek their support.
2. A copy of work you have done for them, a paper, etc. showing some of your best work.
3. A resume, or CV, especially if the faculty person does not know about some of your work or internship experiences. Be prepared to tell them about it in your meeting if it relates to your application.
4. A list of your activities, extra and co-curricular.
5. A copy of the latest draft of your personal statement.
6. All completed forms including the printed recommendation request form that you create from your PIR account, stamps and envelopes your faculty person might need.

Suggested “talking points,” especially if you do not know the faculty person very well, include:

- How do you demonstrate the attributes of a strong applicant?
- How and in what capacity have they observed these qualities in you?
- Make this clear for your writer and give anecdotes that demonstrate how they have supervised you in learning skills that make you a perfect fit for your chosen health profession.

Recommendation Letters for Graduate School and a Professional Program
Some students apply for a graduate program such as public health, biology, chemistry, etc., concurrently with their professional school applications. You really need separate sets of recommendation letters for professional school and graduate school. The Career Center generally collects letters for graduate school. Professional school letters are submitted to the prehealth advising
office, at the address printed on the recommendation request waiver form that you print from your PIR account.

If you have a strong enough relationship with a mentor, he or she may be willing to write outstanding letters for both. However, be very clear with the recommender about which you are requesting (professional school, graduate school, or both), and give extra attention to whether the recommender is comfortable writing equally strong letters for both programs.
Leadership, Service and Extra Curricular Activities: Demonstrating Mastery of the Skills and Qualities Needed to Thrive in a Healthcare Setting

Leadership and service to others are important components of a strong health professional school application. Admissions committees are looking for evidence that you have the capacity to care for others and want to make a difference in the world, but also possess the goal-setting and teamwork abilities necessary to thrive in the healthcare environment. Demonstrating a sustained involvement in extracurricular activities can showcase your skills and experience in leadership, communication and project management.

**Leadership -- What is It?**

Leadership is the ability to move people toward the achievement of a collective goal and can often be demonstrated by your involvement in volunteer work, school activities, and employment. But articulating demonstrated leadership experience in your application is more than just listing formal leadership positions held and goes beyond sitting on a committee or planning an event. Demonstrated leadership skills involve showing how you motivated others and produced results that benefited the campus or community. You can show your leadership skills, specifically, your abilities to motivate others, bring people together, take initiative, and implement practical solutions, through sustained involvement in a few activities about which you are genuinely passionate.

**Career Exploration**

The decision to become a healthcare professional cannot be made solely in the classroom. You should begin to confirm your interest in a healthcare profession through career exploration. Successful applicants demonstrate to admissions committees that they have thoroughly investigated their chosen profession and have thoughtfully considered how they will handle any drawbacks that it presents. As a result, career exploration may either solidify your career choice or redirect you to another profession. Either way, the experience will be useful knowledge.

The Career Center, located in the Danforth University Center, is the place to search for summer internships, for year-round job opportunities, to do mock interviews and to get help with networking with alumni or other contacts.

**Community Service**

Choose service that you *genuinely* enjoy – these experiences can reveal a lot about your career interests or can provide inspiration for your personal statement. Once you are involved in a meaningful activity, *stay involved.*

Volunteering to work in a healthcare setting is a great way to engage in community service and explore a career at the same time. Examples of healthcare settings and patient populations that WU students have volunteered with include:

- Work in a pediatric dental clinic with an organization like Give Kids a Smile
- Be a visitor for a hospital patient, a family member or a nursing home resident or even a caregiver relief with BJC Hospice Services
- Volunteer in rehabilitation centers affiliated with Barnes Jewish West County Hospital like Sports Therapy and Rehabilitation Center (STAR)
- Provide options counseling to women with troubled pregnancies with Planned Parenthood
• Provide play, distraction and comfort to patients at St. Louis Children’s Hospital
• Work one-on-one with kids and young adults with physical disabilities in a sports program like KEEN St. Louis

You do not have to restrict your volunteering to clinical settings. You can tutor through the Campus Y or be involved in Habitat for Humanity or any other community service project. Participate in community service because you genuinely enjoy it; pursuing community service just to improve your application can backfire. It is extremely difficult to sound sincerely passionate about something that is actually just another chore to complete.

Summer and breaks at home can be a great time to volunteer in your community. A national database of volunteer opportunities can be found at [http://www.allforgood.org](http://www.allforgood.org). Volunteer opportunities in St. Louis are plentiful. The Community Service Office has a searchable database of agencies with: [http://communityservice.wustl.edu/stlagencies/](http://communityservice.wustl.edu/stlagencies/). You can search by keyword, or a category, such as “health.” Some specific examples are listed below to illustrate the breadth of settings and issues you can learn about through community service.

• Casa de Salud—provides clinical and mental health services to underinsured or uninsured immigrant and refugee population
• GlobeMed—students partner with grassroots organizations around the world to improve health of people living in poverty
• Night Off—volunteers take care of kids with autism to give their parents a break for a night
• Each One Teach One—tutor “at risk” kids ranging from Kindergarten through 12th grade
• P.A.L.s (Promoting Active Lifestyles)—promote active lifestyle to youth in efforts to fight childhood obesity
• The Burning Kumquat—student run urban garden; mission is to raise consciousness of community, food and environmental issues
• Uncle Joe’s Peer Counseling—student run peer counseling service
• Animal Protective Association of Missouri (APA)—a non-profit group aimed at bringing animals and people together

Clinical Exposure

Clinical exposure demonstrates that you have a true interest in a profession and understand what healthcare professionals do on a daily basis. It would be difficult for an applicant to talk about or write about their desire to pursue medicine, dentistry, etc. if they have never spent time in the clinical setting.

Emphasize career exploration activities that allow you to actively participate in an appropriate manner, rather than simply being a passive observer. There are many avenues for you to obtain clinical exposure. While admissions criteria vary somewhat by health profession, medical schools do not have a preference for one type of clinical exposure over another. Volunteer opportunities may offer clinical exposure while still allowing you to be an active participant. A variety of employment options also offer the chance to observe practitioners, while actively contributing to the delivery of excellent health care. Students may pursue part-time or summer employment in roles such as

• Certified Nursing Assistant (CNA)
• Emergency Room Technician
• Patient Care Technician
• Physician Scribe
• EMT
• Clinical Research Assistant
• Office Assistant (for example, in a private practice)
Shadowing opportunities are another mechanism for obtaining clinical exposure. Many students benefit from an ongoing relationship with a mentor in their chosen profession. Finding a mentor can be a challenging task. Start with your personal contacts in the professions that interest you (for example, your personal or your family’s physicians, your pet’s veterinarian, your dentist or a relative practicing in the health care field). Many of our students shadow WU physicians through the Bio 2654 Med Prep II course, and students also gain clinical research experience through Bio2652 PEMRAP or Bio2651 Section 3 Clinical Research in Barnes Emergency Medicine course. Students who pursue basic science research with a physician-scientist or a basic scientist who collaborates with physicians may eventually shadow their laboratory mentors in the clinic.

Making a contribution through volunteer service or employment may foster a stronger connection with healthcare professionals, which may in turn cultivate greater opportunities and access, and, eventually, letters of recommendation. With changes in healthcare laws, hospitals have become more restrictive in allowing students to be in the clinical setting. Pay close attention to any specific requirements that some facilities may have such as patient confidentiality training, background checks, immunization requirements or TB testing.

Some professional organizations will connect you with practitioners in your region. The American Association of Colleges of Osteopathic Medicine, for example, gives advice on locating a D.O. to shadow: [http://www.aacom.org/InfoFor/applicants/becoming/Pages/ShadowaDO.aspx](http://www.aacom.org/InfoFor/applicants/becoming/Pages/ShadowaDO.aspx), and the American Dental Association has a list of regional mentoring coordinators: [http://www.ada.org/2194.aspx](http://www.ada.org/2194.aspx). The Career Center, located in the Danforth University Center, is an excellent resource for how to set up shadowing experiences and how to network. The Career Center can also help you create a cover letter and resume - tools you will typically need to approach health care professionals about shadowing opportunities, organizations seeking volunteer workers, or potential employers about a job or internship.

**What is the graduate professional program in your field actually like?**

Consider informational interviews with individuals at every stage of the career you are exploring. The perspectives of senior students at Washington University who are in the midst of the application process as well as the views of accepted students at professional schools will be important in ascertaining whether the professional training process is one you will enjoy and wish to complete. There will be programming throughout the year, sponsored by the Career Center, the College Office and the pre-professional student organizations, that will enable you to access WU students and alums who can answer questions about application to professional school and professional school itself.

**Research**

- Take advantage of Wash-U’s resources as a research institution
- If you intend on applying to a PhD or MD/PhD program, get involved in research early.

Washington University is a research institution; research is part of our culture. When you pursue undergraduate research, you access an important part of what this institution has to offer. Research opportunities are available in all disciplines. For example, many students pursue laboratory research, but others pursue field research in archaeology or environmental studies. Economists, physicists, and biophysicists do computer modeling in their research, and traditional library research and primary document research provide invaluable skills for students no matter what professional goals they may have. Many of our students do independent research in the humanities and the social sciences, often leading to honors theses in these majors.

Some students begin their research as early as the pre-freshman summer; for others, fall of the junior year is an excellent time to begin research. For more information about research opportunities in the Division of Biological and Biomedical Sciences on the Danforth or Medical School campuses be sure to look into [Bio 200/500](http://www.nslc.wustl.edu/courses/Bio500/bio500.html): The SURF program supports summer research. Application deadlines for these programs usually are in January.
Check the website for the Undergraduate Research Office (www.ur.wustl.edu) for details. Some students conduct clinical research through the PEMRAP course: http://nsle.wustl.edu/courses/Bio2652/

Study Abroad
Study abroad is a rich and rewarding experience for students wanting to enhance language skills and experience another culture. There are several semester programs that might be of interest to students who want to independent research on international public health issues. There are many summer programs, as well.

Both formal study abroad and less structured service trips may offer more extensive clinical involvement than is normally possible in the U.S. Before you go, familiarize yourself with the AAMC’s Guidelines for Premedical Students Providing Care Abroad.

The Gephardt Institute for Public Service sponsors a number of opportunities for community service abroad as well as in the U.S. http://www.gephardtinstitute.wustl.edu/

Since medical schools do not accept foreign transcripts, many students who spend a semester abroad move a science sequence (most often physics or organic chemistry) to the summer, and many choose to take a gap year between WU and professional or graduate school. To study abroad, students must have a 3.0 cumulative GPA and in some cases, be proficient in a foreign language. Below, we have highlighted some of the health-related abroad programs. However, we would encourage students to examine all of the study abroad opportunities offered through Washington University.

Programs abroad for Pre-Health students include:

Danish Institute for Study Abroad (DIS) http://www.dis.dk/
* Copenhagen, Denmark
  DIS offers the opportunity to experience several European hospitals.
  * Minimum 3.0 GPA
  * 2 semesters of biology required
  * 2 semesters of chemistry required

School of International Training (SIT) – South Africa Public Health Program
SIT offers a number of Global Health programs in various locations. SIT programs are designed to introduce students to fieldwork by first instructing students on a particular theme, through classroom instruction, and then supervising students as they undertake month long independent study projects.

King’s College London Premedical Programme
  * Minimum 3.3 GPA

WU’s Pre-Med Summer Program in Nice, France http://artsci.wustl.edu/~chwinn/
  This program accommodates students in a broad spectrum of health-related fields. There is opportunity for clinical shadowing.
• 3.0 GPA
• Completion of French 307 or more

Overseas Program Details [http://overseas.wustl.edu/](http://overseas.wustl.edu/)

**Study abroad advising:**

Ms. Kristen Sobotka (ksobotka@artsci.wustl.edu) and Dean Wilmetta Toliver-Diallo (toliver-diallo@wustl.edu) have a special interest in advising prehealth students who are exploring their study abroad options.

Overseas Programs, McMillan Hall, Room 138; [overseas@wustl.edu](mailto:overseas@wustl.edu)

**Summer Options**

- Summer is a great time to do research, explore the clinical setting, or do an internship
- You can build on an established experience, or start something new.
- Many students work in the summer while continuing to volunteer or shadow.

You can consider laboratory jobs, jobs in health settings, or community service positions. You can study abroad or take summer courses to increase your options during the school year. Summer is also a great time to do an internship. Information about available internships may be found in the Career Center.

Many of you will want to do summer research, and you should apply in the early spring for the summer undergraduate research program here and at other universities. There are other paid summer research opportunities that you will find listed on the websites of the Office of Undergraduate Research, [http://undergradresearch.wustl.edu/](http://undergradresearch.wustl.edu/) and the Career Center, [http://careercenter.wustl.edu/](http://careercenter.wustl.edu/)
WU Arts & Sciences Cover Letter

Arts & Sciences provides an application service to collect and forward your letters of recommendation. In addition to your recommendation letters, we will provide a letter of introduction highlighting the strengths of your candidacy, if your application process welcomes such a letter. **All medical schools expect A&S applicants to have a prehealth cover letter.** You must create a PIR account and participate in the PIR process in order for us to write a cover letter for your application.

**Register With Us in September; Apply in June**

Whether you are applying after the Junior year or later, it is essential that you start meeting with a prehealth advisor an academic year before you intend to submit your application. The Prehealth Letters and Personal Information Review (PIR) system is an online tool you will use to communicate with your prehealth advisor, and store and request application materials.

The PIR interview process is designed to help you step into the application fully prepared, and give us the information we need to write the cover letter. The PIR system will store documents about who you are (answers to interview questions, personal statement, resume and AMCAS activities section if appropriate), as well as your letters of recommendation. Creating a PIR account in September alerts us that you need a prehealth advisor assigned, and allows us to easily store letters submitted by your faculty. We do not assign specific prehealth advisors before students are ready to complete the PIR questions and interview. However, all members of the prehealth team welcome the opportunity to meet with students and answer questions. Click here for a list of advisors and contact information. For detailed instructions for creating and using your PIR account, see Appendix L (available online).

**Deciding When to Apply**

There is a lot to accomplish before you are ready to apply: completing coursework, preparing for a standardized test, securing letters of recommendation, and acquiring an appropriate co-curricular portfolio. About half of our students utilize the senior year to complete some of these tasks, applying right after graduation, instead of the summer after the Junior year.
What if I Have a Question?
Your academic advisor is an excellent resource. Contact information for pre-health advisors is listed below, or you can email Ms. Heidger the PreHealth Program Coordinator at prehealth@artsci.wustl.edu.

Dean Joan Downey, M.D., M.P.H.
downey@wustl.edu, 935-7997
Walk-in hours: Thursdays 10 - 11:30
Cornerstone
*Schedule an appointment with Dean Downey online, Password: prehealth

Dean Nicole Gore
ngore@wustl.edu, 935-8277
Walk-in hours: check The College Office Dean of the Day Schedule for current semester hours
Arts & Sciences, Cupples II, Suite 104
*Schedule an appointment with Dean Gore online, Password: gore

Dean Carolyn Herman
cherman@wustl.edu, 935-8076
Walk-in hours: check The College Office Dean of the Day Schedule for current semester hours
Arts & Sciences, Cupples II, Suite 104
*Schedule an appointment with Dean Herman online, Password: prehealth

Dean Joy Kiefer
jkiefer@artsci.wustl.edu, 935-8136
Walk-in hours: check The College Office Dean of the Day Schedule for current semester hours
Cupples II, Suite 104

Carol Moakley, MSW
cmoakley@wustl.edu, 935-4985
Career Center, DUC 110

Michaele Penkoske, M.D.
mpenkoske@wustl.edu, 935-5930
Career Center, DUC 110
by appointment, Wed. and Thurs. 9 - 5

Gregory M. Polites, M.D.gpolites@wustl.edu,
747-5268
Division of Emergency Medicine, Barnes-Jewish Hospital, Barnard Building, 8th Floor, Room 8812.
*Schedule an appointment with Dr. Polites online

Kristin Sobotka
ksobotka@artsci.wustl.edu, 935-7494
Arts & Sciences, Cupples II, Suite 104
*Schedule an appointment with Ms. Sobotka
Password: research

Dean Wilmetta Toliver-Diallo
toliver-diallo@wustl.edu, 935-7879
Walk-in hours: check The College Office Dean of the Day Schedule for current semester hours
Arts & Sciences, Cupples II, Suite 104
*Schedule an appointment with Dean Diallo

SPECIALTY ADVISING

Pre-RN Advising
Dean Matt DeVoll
mwdevoll@wustl.edu, 935-5392
Walk-in hours: Tuesdays 9:00 - Noon
Arts & Sciences, Cupples II, Suite 104

Pre-Dental Advising
Dean Warren Davis
wjdavis@wustl.edu, 935-6806
Walk-in hours: check The College Office Dean of the Day Schedule for current semester hours
Arts & Sciences, Cupples II, Suite 104

Pre-Vet Advising
Dean Jennifer Romney
jiromney@wustl.edu, 935-7969
Walk-in hours: check The College Office Dean of the Day Schedule for current semester hours
Arts & Sciences, Cupples II, Suite 104

Pre-PT Advising
Ms. Clarissa Smith, PT
csmith45@wustl.edu, 935-5930
Career Center, DUC 110
PreHealth Specialty Advising (Continued)

Pre-OT Advising
Kathy Kniepman, OTD, MPH, OTR/L
kniepmannk@wusm.wustl.edu, 286-1610
Washington University School of Medicine
Program in Occupational Therapy
4444 Forest Park, Campus Box 8505

Cornerstone
MCAT and Personal Statement Resource

Harvey Fields, Ph.D.
Assistant Director, Academic Programs
hrfields@wustl.edu, 935-5965

Robert Hakan Patterson, Ph.D.
Writing Programs & MCAT Coordinator, Cornerstone
rhpatter@wustl.edu, 935-8099

University College
Post-Baccalaureate PreMedical Program

Elizabeth Fogt
efopt@wustl.edu, 935-6778
by appointment: call 935-6759
January, Room 30

Shawn Cummings
cummingss@wustl.edu, 935-6783
by appointment: call 935-6700
January, Room 30

School of Engineering

Ron Laue, Ph.D.
rwbrand@seas.wustl.edu, 935-6100
303 Lopata Hall

* To access online advising calendars go to http://prehealth.wustl.edu/advising
## Appendix A

**MCAT and BCPM (Science) GPA Grid for Applicants and Acceptees from WU Arts & Sciences to U.S. Medical Schools, 2007-2011 (aggregated)**

The table below displays the acceptance rates at different MCAT and BCPM (science) GPA levels for applicants and accepted applicants from 2007 to 2011. The frequencies are combined totals of all five years. For students who applied more than once, each application is included. Engineering applications are not included.

| BCPM GPA Total | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % | Acceptees | Applicants | Acceptance rate % |
|----------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|-----------|------------|-------------------|
| 3.80-4.00      | 0         | 0          | 0                 | 0         | 0          | 1                 | 5         | 19         | 43                | 200       | 210        | 95%               | 191       | 215        | 95%               | 202       | 247        | 82%               | 137       | 207        | 66%               | 149       | 149        | 55%               | 23        | 69         | 33%               | 15        | 54         | 28%               |
| 3.60-3.79      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 3.40-3.59      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 3.20-3.39      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 3.00-3.19      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 2.80-2.99      | 1         | 1          | 1                 | 1         | 1          | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 | 1         | 1           | 1                 |
| 2.60-2.79      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 2.40-2.59      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 2.20-2.39      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 2.00-2.19      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |
| 1.47-1.99      | 0         | 0          | 0                 | 0         | 0          | 2                 | 12        | 40         | 65                | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               | 191       | 191        | 95%               |

**Source:** AAMC Data from applicant/matriculant file provided to Washington University.
Appendix B
Health Care Spans Many Career Opportunities

The following pages are an introduction to some common health care fields. This information is intended as a starting point to help you begin to compare options and investigate your interests. Each section includes links to more information on the particular profession.

**Athletic Training**

An athletic trainer is a highly skilled health practitioner specializing in sports medicine. Athletic trainers play a significant role in the management, prevention and rehabilitation of injured athletes. Under the supervision of a licensed physician, athletic trainers administer immediate emergency and follow-up care to optimize one’s ability to participate in activity. They develop athletic injury prevention and treatment programs using their strong knowledge of biomechanics, anatomy and pathology.

Athletic trainers also provide a vital communication link between the injured athlete, the physician, the coach, and sometimes the athlete's family, to determine when it’s right to return to practice and competition.

**Professional Opportunities**

- Colleges and universities
- Military
- Professional sports
- Sports medicine clinics
- Secondary schools
- Other specialized companies like dance or entertainment (circus troupe)

**Exposure to the Field, Shadowing, and Volunteering**
Prospective applicants should familiarize themselves with the duties, activities, and skills of athletic trainers before applying. Many schools require a minimum number of observation hours that an applicant must have with a certified athletic trainer. Opportunities can be found in places like colleges and universities, secondary schools and sports medicine clinics.

**The Application Process**

*Undergraduate Prerequisites*
Requirements vary by program, but coursework that will help you explore this field includes human anatomy and physiology, biology, physics, nutrition, statistics, and psychology. **Check individual programs’ requirements at least a year before you apply.**

To become certified athletic trainers, students with a bachelor’s degree continue their educations in an entry-level master’s from an accredited professional athletic training education program. They must also pass a comprehensive test administered by the [Board of Certification](http://www.certification). Once certified, they must meet ongoing continuing education requirements in order to remain certified.

**Resources/Links**

Audiology

Audiology, Deaf Education, Speech and Hearing-Professions focused on aiding those with hearing and speech impediments include audiology, speech-language pathology, and speech, language and hearing scientist.

Audiologists are experts in the non-medical management of the auditory and balance systems. They specialize in the study of normal and impaired hearing, prevention of hearing loss, identification and assessment of hearing and balance problems, and rehabilitation of persons with hearing and balance disorders. Audiologists frequently work with other medical specialists, speech-language pathologists, educators, engineers, scientists, and allied health professionals and technicians. Working with the full range of human communication and its disorders, speech-language pathologists evaluate and diagnose speech, language, cognitive-communication and swallowing disorders and treat speech, language, cognitive-communication and swallowing disorders in individuals of all ages, from infants to the elderly. Speech-language pathologists often work as part of a team, which may include teachers, physicians, audiologists, psychologists, social workers, rehabilitation counselors and others. Corporate speech-language pathologists also work with employees to improve communication with their customers.

Providing the research on which clinicians base their methodology, speech, language and hearing scientists investigate the biological, physical, and physiological processes of communication, explore the impact of psychological, social, and other factors on communication disorders, develop evidence-based methods for diagnosing and treating individuals with speech, language and hearing problems, as well as collaborate with related professionals (such as engineers, physicians, dentists, educators) to develop a comprehensive approach to diagnosing and treating individuals with speech, voice, language and hearing problems. As with audiologists and speech-language pathologists, research scientists are educated in their specific area of interest. However, while clinicians can practice with a master's degree or clinical doctorate, scientists must earn a research doctorate.

Professional Opportunities
Audiologists may:

- Plan and execute programs of hearing conservation for workers.
- Manage agencies, clinics or private practices
- Engage in research to enhance knowledge about normal hearing, and the evaluation and treatment of hearing disorders
• Design hearing instruments and testing equipment

Speech-language pathologists may:

• Manage agencies, clinics, organizations, or private practices.
• Engage in research to enhance knowledge about human communication processes.
• Supervise and direct public school or clinical programs.
• Develop new methods and products to evaluate and treat speech-language disorders.

Speech Hearing Scientists may:

• Prepare future professionals and scientists in colleges and universities.
• Conduct research at or consult with universities, hospitals, government health agencies and industries.

Exposure to the Field, Shadowing, and Volunteering

Students considering a career in communication sciences and disorders should consider whether they envision working as a clinician with certain populations such as children, adolescents, or adults with a particular disorder, working in health administration settings, or as a research scientist. It is important to investigate each of these options before embarking on an educational pathway.

Undergraduate Prerequisites

Requirements vary by program, but coursework that will help you explore this field includes normal language development, psychology, child psychology, disordered speech and language development.

Resources/Links

• American Speech-Language-Hearing Association (ASHA), http://www.asha.org/
• Program in Audiology and Communication Sciences (PACS) at Washington University School of Medicine in St. Louis, http://pacs.wustl.edu/pacs/pacsweb.nsf/

Dentistry

Dentistry is the branch of the healing arts devoted to maintaining the health of the teeth, gums and other hard and soft tissues of the oral cavity and adjacent structures. A dentist is a scientist and clinician dedicated to the highest standards of health through prevention, diagnosis and treatment of oral diseases and conditions. Dentists are also instrumental in early detection of oral cancer and systemic conditions of the body that manifest themselves in the mouth. Today, dentists are highly sophisticated health professionals who provide a wide range of care that contributes enormously to the quality of their patients’ day-to-day lives by preventing tooth decay, periodontal disease, malocclusion, and oral-facial anomalies. (Source: The ADEA Official Guide to Dental Schools: Opportunities in Dentistry).
Clinical Fields

- **General dentistry** - General dentists use their oral diagnostic, preventative, surgical, and rehabilitative skills to restore damaged or missing tooth structure and treat diseases of the bone and soft tissue. They also provide patients with preventive oral health care.

- **Dental Public Health** - These individuals are involved in developing policies and programs (like health care reform) that affect the community at large.

- **Endodontics** - Endodontists diagnose and treat diseases and injuries that are specific to the dental nerves and pulp and the tissues that affect the vitality of the teeth.

- **Oral and Maxillofacial Pathology** - These dental scientists study and research the causes, processes, and effects of diseases with oral manifestations. Most oral pathologists do not treat patients directly. Instead, they provide critical diagnostic and consultative biopsy services to dentists and physicians.

- **Oral and Maxillofacial Radiology** - Oral radiologists interpret conventional, digital, CT, MRI, and allied imaging modalities of oral-facial structures ad disease.

- **Oral and Maxillofacial Surgery** - These specialists provide a broad range of diagnostics services and treatments for diseases, injuries, and defects of the neck, head, jaw, and associated structures.

- **Orthodontics and Dentofacial Orthopedics** - Orthodontists treat irregular dental development, missing teeth, and other abnormalities. Orthodontists establish normal teeth functioning and appearance in their patients.

- **Pediatric Dentistry** - Pediatric dentists treat both children from birth to adolescence and disabled patients beyond the age of adolescence.

- **Periodontics** - Periodontists diagnose and treat diseases of the gingival tissue – the gum, oral mucous membranes, and other tissues surrounding the teeth -- and bone supporting the teeth.

- **Prosthodontics** - Prosthodontists replace missing natural teeth with fixed and removable appliances, such as dentures, bridges, and implants.

<table>
<thead>
<tr>
<th>Program</th>
<th>Programs</th>
<th>Length</th>
<th>No. of first year students</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Dentistry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Practice Residencies (GPR)</td>
<td>193</td>
<td>12 months</td>
<td>896</td>
</tr>
<tr>
<td>Advanced Education in General Dentistry (AEGD)</td>
<td>83</td>
<td>12 months</td>
<td>524</td>
</tr>
<tr>
<td>Specialties</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dental Public Health</td>
<td>13</td>
<td>12 to 24 months</td>
<td>17</td>
</tr>
<tr>
<td>Endodontics</td>
<td>53</td>
<td>24 to 36 months</td>
<td>208</td>
</tr>
<tr>
<td>Oral and Maxillofacial Pathology</td>
<td>13</td>
<td>36 months</td>
<td>12</td>
</tr>
<tr>
<td>Oral and Maxillofacial Radiology</td>
<td>5</td>
<td>24 to 36 months</td>
<td>4</td>
</tr>
<tr>
<td>Oral and Maxillofacial Surgery</td>
<td>100</td>
<td>4 to 6 years</td>
<td>217</td>
</tr>
<tr>
<td>Orthodontics and Dentofacial Orthopedics</td>
<td>62</td>
<td>24 to 36 months</td>
<td>353</td>
</tr>
<tr>
<td>Pediatric Dentistry</td>
<td>69</td>
<td>24 to 36 months</td>
<td>316</td>
</tr>
<tr>
<td>Periodontics</td>
<td>53</td>
<td>36 months</td>
<td>170</td>
</tr>
<tr>
<td>Prosthodontics</td>
<td>44</td>
<td>12 to 36 months</td>
<td>146</td>
</tr>
</tbody>
</table>

Source: American Dental Association, Survey Center, 2006-07 Survey of Advanced Dental Education
Professional Opportunities

- Self-Employment in Private Practice
- Practice as a Salaried Employee or Associate
- Academic Dentistry and Dental Education
- Dental Research
- Service in the Federal Government
- Public Health Care Policy
- International Health Care

Exposure to the Field, Shadowing, and Volunteering

Students should familiarize themselves with the dental field before applying to dental school. This is necessary for both making an informed career decision and completing a successful dental school application (shadowing and volunteering is a requirement for most dental schools). Opportunities can be found via the following resources and elsewhere:

- Your family or local dentist: They are often eager to talk about their career and may be open to providing a shadowing experience.
- American Dental Association (ADA) International Volunteer Website
- ADEA Opportunities for Minority Students in United States Dental Schools

The Application Process

There are 58 dental schools in the United States; 57 are 4-year schools and 1 is a 3-year school (University of the Pacific). There are now approximately 12,000 applicants for 5,000 first year places or a 2.4/1 ratio. There are approximately 57% males and 43% females in School.

The ADEA Official Guide to Dental Schools, available online (www.adea.org) is a comprehensive guide with up-to-date information on preparing for and applying to dental schools. You should consult this for requirements, admissions statistics, and financial aid procedures for individual dental schools and programs.

Undergraduate Prerequisites

Most dental schools require 2 semesters of coursework and corresponding labs in each of the following: general chemistry, organic chemistry, biology, and physics. Students should check with individual schools and the ADEA Official Guide to Dental Schools, as increasingly more schools are adding requirements for coursework in biochemistry and math.

Timeline

Students begin the application process over a year prior to actual enrollment in dental school. Applicants should plan to take the DAT in late spring or early summer. They should spend June (the AADSAS application is available on or around June 1) through August applying to schools, completing both the primary AADSAS application and the school-specific supplemental applications. Applications should prepare for interviews in the fall by budgeting time and finances appropriately. Notification of dental school acceptance offers begins on December 1.

Undergraduate Experience

Students are required to complete a minimum of 2-3 years of undergraduate education (also called a “predental education”) although 95% of students in dental school do have an undergraduate degree. The overall GPA for students currently in dental school is a 3.5 with the
science GPA being slightly lower. Note that this GPA is a national average; Washington University students successfully apply to dental school with somewhat more modest grade point averages.

Extracurricular Activities
Successful dental school applicants demonstrate a continued commitment to serving others. They are involved in their communities, find volunteer activities that are meaningful to them, provide leadership in their organizations, tutor, serves as RA’s, conduct research, etc. Similar to other pre-health students, dental school applicants should participate in activities in clinical settings (though opportunities for research in dentistry are relatively few).

Dental Admissions Test (DAT)
Applicants must take the Dental Admissions Test (DAT). The DAT is a computerized test and can be scheduled year-round. The test includes the following sections: tutorial, survey of Natural Sciences, Perceptual Ability Test, Reading Comprehension, Quantitative Reasoning and Post Test Survey. The grading on each component is 1-30. Perceptual Ability forms one score and the remainder comprise the Science Score. Scores of 19-20 and above are competitive for dental school admission. Details about the test, sample questions, and scheduling information can be found at www.ada.org/prof/ed/testing/dat/.

The Application
Students apply through a centralization application service, the American Association of Dental Schools Application Service (AADSAS). Students can obtain information and begin the application at https://portal.aadsasweb.org/. The application processing can take 4-8 weeks, and applicants are able to monitor the status online.

Letters of Evaluation
Applicants may submit a maximum of four individual Letters of Evaluations or one Committee Letter/Report plus the optional of one additional individual letter. Evaluators have the option of submitting their letters electronically or by mail.

Resources/Links
- Associated American Dental Schools Application Service – www.adea.org/dental_education_pathways/aadsas/Pages/default.aspx
- American Dental Education Association (ADEA) – www.adea.org
- American Dental Association – www.ada.org/

The healthcare professionals manage today’s hospital and healthcare organizations. They are there to ensure that their organization has sufficient medical, operational and financial footing to serve the needs of patients, their families, and the community. They are skilled, trained professionals, who care about the quality of patient care. They work alongside physicians, nurses, and other professionals to provide care. Healthcare administrators help educate the community about health issues, and they also have the opportunity to improve the health of the communities their organizations serve. Many professionals in this field have specialized training
in business administration, finance, computer and information technology, clinical laboratory science, and pharmacy.

**Professional Opportunities:**
With growing diversity in the healthcare system, administrators are needed in many settings, including:

- Clinics
- Consulting firms
- Health insurance organizations
- Healthcare Association
- Hospitals
- Nursing homes
- Physician practices
- Mental health organizations
- Public health departments
- Rehabilitation centers
- Skilled nursing facilities
- Universities and research institutions

**Exposure to the Field, Shadowing, and Volunteering**
Interested students should talk to professionals in the field through visits to nearby hospitals and healthcare organizations or participation in a healthcare-focused volunteer program (this is essential to making an informed career decision and some programs require applicants to have work experience in the public sector before applying).

Reading about healthcare is very informative on the dynamics of the field. You can find interesting articles in the *St. Louis Post Dispatch*, national magazines such as *Newsweek* and *Time*, and trade publications such as *Healthcare Executive, Frontiers of Health Service Management, Journal of Healthcare Management*, or *Modern Healthcare*.

**The Application Process**
*Undergraduate Pre-Requisites:*
Students seeking master’s degrees in public health and administration come from a variety of educational backgrounds. There are no uniform prerequisites for applying to these schools and programs. However it is important to research individual schools, checking to see if they require specific undergraduate coursework. Undergraduate health management courses, while generally not required, may help you explore your interest in this field.

Some programs require applicants to have work experience in the public health sector before applying.

*Standardized Testing*
The majority of schools require GRE test scores, but some institutions may consider other standardized tests such as MCAT, DAT, GMAT, or LSAT.

*Degrees*
A Master’s degree is required for nearly every position in the healthcare management field. The Accrediting Commission on Education for Health Services Education provides a list of accredited graduate health administration programs. These include:

- Master of Business Administration
- Master of Public Health
- Master of Science in Public Health
- Master of Public Administration
• Master of Health Administration

In the past, most students chose the traditional route of a master’s degree in health administration or public health. Today, students are investigating other options, including graduate degrees in business and public administration, with a concentration in health services management. Some schools offer a joint degree—a master’s degree in both business administration and public health or in both healthcare management and law.

Graduate programs generally last two years and lead to a master’s degree. They include course work in healthcare policy and law, marketing, organizational behavior, healthcare financing, human resources, and other healthcare management topics. Programs may also include a supervised internship, residency, or fellowship.

Resources/Links

• Commission on Accreditation of Healthcare Management Education – http://www.cahme.org/
• American College of Healthcare Executives – http://www.healthmanagementcareers.org/

A career as a physician involves challenges, opportunities, and a chance to make a difference. It requires an inquisitive mind, an interest in science and how the body works, and a strong commitment to caring about other people and their problems. You should enjoy both using your knowledge to help others and increasing your knowledge for improving the lives of others.

Doctors diagnose illnesses and treat people who suffer from injury or disease. Their professional lives are filled with caring for people, keeping up with advances in medicine, and working as a part of a health care team. Every day in communities around the country, doctors work in neighborhood clinics, hospitals, offices, even homeless shelters and schools. Few fields offer a wider variety of opportunities.

Professional Opportunities

• Primary care doctors - general internists, family physicians, and general pediatricians who are trained to provide a wide range of services children and adults need. When patients require further treatment, primary care doctors send them to…
• Specialist physicians, who focus on treating a particular system or part of the body, include surgeons, neurologists, cardiologists, and ophthalmologists.

Physicians work together to provide patients with complete care throughout life. An MD degree provides many other opportunities, including:

• Physician researches
• Academic physicians
• Health maintenance organization work
• Pharmaceutical development
Corporate work (directing health and safety program)

**Exposure to the Field, Shadowing, and Volunteering**
A commitment to serving others is an integral part of a career as a physician as well as successful admittance to an MD or DO program. You can volunteer right on campus at the Washington University Medical Center.

You do not need to limit your volunteering to the clinical environment. You can also do volunteer outreach in the community. Some projects are available through the Campus Y. You can also initiate your own projects. For example, you can tutor, help build a house through Habitat for Humanity, serve meals at a soup kitchen, or participate in the 200 student groups on campus.

**The Application Process**

*Timeline*
See Appendix C for detailed information on the medical school application process, including when you should take the MCAT, compile your letters of recommendation, and submit your application portfolio.

*Undergraduate Experience*
Requirements for entry into a specific program may vary, and students are urged to check individual schools for complete information. Common requirements and the WU courses that fulfill them can be found in the table on pages 5-6.

See Appendix D for suggestions on sequencing these courses. Appendix F, G, and H lists schools that require math, biochemistry, and upper-level biology, respectively.

*GPA*
Regardless of your major, both your overall GPA and your science GPA should be strong. A GPA of at least 3.5 *at time of application* should put you in a strong position, although the most selective medical schools (including WUSM) will look for higher grade-point averages (3.7+). Many students have lower grades early in college, build a consistent upward trend and are very competitive by the time they are applying in the junior or senior year.

Students ask whether the rigor of their coursework will be recognized by graduate programs when they apply. We are certain that many schools do recognize the rigor of our program. For example, the national mean GPA of students admitted to medical school is almost 3.7, but over 90% of WU students with a 3.5 GPA are admitted to medical school.

Appendix A details the percentage acceptance of WU students by science gpa and MCAT in the past five years.

*Research*
Some schools strongly favor applicants with research experience. Most schools require significant clinical experience as well.

*The MCAT*
Most medical schools require applicants to take the MCAT. The current MCAT reports four scores. Three of the scores are on a scale ranging from 1 (lowest) to 15 (highest) in the
areas of:

- **Verbal Reasoning** -- tests critical thinking and reasoning skills.

- **Biological Sciences** – tests problem solving and knowledge of basic concepts in biology and biologically related chemistry.

- **Physical Sciences**-- tests problem solving and knowledge of basic concepts in physics and physically related sciences.

- The fourth score is based on two essays measuring analytical abilities and writing skills.

  The essays receive one score ranging from “J” (lowest) to “T” (highest).

The Writing section is being phased out, and beginning in 2015, a Behavioral and Social Sciences section will be added. We expect this section to test introductory Psychology and concepts in sociology or medical anthropology.

The MCAT is given many times a year. Students are encouraged to take the MCAT 18 months before they plan to enter medical school. For many students this means taking the MCAT in their junior year. Some students find that it is helpful to take a preparation course for the MCAT. Go to http://www.aamc.org/students/mcat/ for more information.

This past year, there were more than 20 administrations of the computerized MCAT (see aamc.org/students/mcat/), with results of the examination available within 30 days of taking the test. You need to have your MCAT scores available in June so that you can apply to medical school as early as possible. Take the MCAT when you know you will be well prepared. Some people prefer to spend the summer studying; others find that the school year works well for them. Schedule your application timeline around when you will be most successful on this exam. Some students opt for a gap year so that they have additional time to study for and complete the MCAT.

**Writing**

Your application portfolio includes the personal statement (which is limited to 5300 characters with spaces), an explanation of any institutional action taken against you, an explanation of any felonies on your record, responses to additional questions on the secondary applications, and an optional selection of additional information (where you can address suboptimal science GPA, MCAT, withdrawals or incomplete course work, etc. as needed).

**Resources/Links**

- Medical College Admission Test® (MCAT®), [http://www.aamc.org/students/mcat/](http://www.aamc.org/students/mcat/)

- American Medical College Application Service® (AMCAS®), [https://www.aamc.org/students/applying/amcas/](https://www.aamc.org/students/applying/amcas/)

- Timeline for Application/Admission to Medical School [https://www.aamc.org/students/download/175214/data/timeline.pdf](https://www.aamc.org/students/download/175214/data/timeline.pdf)

MD/PhD Programs or Medical Scientist Training Programs (MSTP) train physician-scientists to become leaders in biomedical research. Students who pursue this option obtain both an MD and a PhD degree with in-depth training in modern biomedical research and clinical medicine. The typical MD/PhD career combines patient care and biomedical research but leans toward research. It is an excellent choice for students who are passionate about research and are certain that research will be an important dimension of their careers.

Since they are completing two graduate degrees, MD/PhD students spend a longer period of time in graduate training. Generally, however, your tuition is paid by federal or institutional grants, and you receive a stipend. So, even though the time to degree (and practice) is longer, you may graduate debt-free. Average program length is 7 - 8 years; however, MD/PhD graduates, on average, are in a position to secure funding to direct a research lab in fewer years than MD graduates who pursue research fellowships after residency.

“One feature that seems common to all committed MD/PhD applicants is a depth of passion for treating today's patients as a physician and tomorrow's patients as a research scientist uncovering the mechanisms underlying disease. The career is inspiring but also filled with challenges and frustrations. Patients don't always get well and experiments don't always succeed. The passion to solve a patient's struggles and to crack the code of a disease's cause carries the physician-scientist through the challenges.” (AAMC website)

Professional Opportunities
An MD/PhD often leads to becoming a faculty member at a medical school, university or research institute such as the National Institutes of Health (NIH). A few MD/PhD graduates opt for research careers in the private sector.

Exposure to the Field, Shadowing, and Volunteering?
Some shadowing and experience in a hospital setting is important, but since physician-scientists will spend most of their careers in a laboratory, a student’s research experience is the most important experiential dimension of the application.

The Application Process
Of the 71 MD-PhD programs, 36 do not accept non-U.S. citizens, but many top-tier research institutions (including Washington University School of Medicine) fund some MD/PhD positions through private sources and welcome international students to apply for those seats. For undergraduate students interested in biomedical research, the MD/PhD programs offer an excellent opportunity.

Undergraduates interested in an MD/PhD program will need to establish an outstanding academic record and a genuine commitment to doing research. Most successful applicants are science majors and have been in the laboratory since their sophomore summer in college and have completed a thesis. Students who are interested in this program and wish to major in the humanities or the social sciences should also plan to pursue a second major in one of the sciences.
Timeline
Some schools require a formal PhD application to be submitted simultaneously with your application to the medical school. In this case, your application is first processed by the medical school admissions committee. If you are accepted to the medical school, the application is then forwarded to the graduate school admissions committee, which evaluates on separate grounds to determine your admission.

Some programs allow application to the PhD portion of an MD/PhD program after entering medical school.

Undergraduate Experience
MD/PhD applicants should have significant research experience, and a science major. Grades and MCAT are important, but one’s potential as a future scientist is the most important consideration in the selection process.

At Washington University, while most of our students who apply to MD/PhD programs happen to have astonishingly good credentials, students who are passionate about their research can absolutely enter an MD/PhD program with more modest science grades and MCAT scores. 30% of the successful MD-PhD applicants from WU in 2004 - 2008 had a science GPA below 3.5, or an MCAT below 33, or both. Of all our applicants from the College of Arts & Sciences to MD/PhD programs in the last five years, 85% were admitted, a very high rate of success.

Research
Prospective MD/PhD candidates should be especially intent on getting as much undergraduate research experience as possible prior to applying. The depth and quality of the research experience is of greater importance than the particular area of investigation. Many candidates will have already authored or co-authored research publications before their graduation.

Standardized Tests
Many MD/PhD programs require GRE exams in your PhD area. If you don’t know explicitly that the schools to which you are applying do not require them, then you should expect to take them.

Letters of Reference
Compelling letters of recommendation from research mentors are crucial. You must obtain reference letters from all of your undergraduate research supervisors.

The MD/PhD Programs
The types of PhDs that can be combined vary considerably from institution to institution. Some institutions only offer PhDs in scientific fields while others are more flexible. You should research each program individually to evaluate its offerings.

General Structure
Most MD/PhD programs arrange for a student to take off from medical school between the second and third years (after the preclinical portion of medical school) to complete his or her PhD. The student then returns after three to seven (typically four) years to resume medical school by beginning the clinical portion. The student is normally awarded both degrees together upon graduating from medical school after a total of seven to ten years.
Resources/Links

- The American Association of Medical Colleges website has extensive MD/PhD information, https://www.aamc.org/students/research/mdphd/, excerpted above.

Nursing

The American Association of Nurses defines nursing as the protection, promotion, and optimization of health and abilities, prevention of illness and injury, alleviation of suffering through the diagnosis and treatment of human response, and advocacy in the care of individuals, families, communities, and populations.

Nursing offers a diverse range of work settings and specializations, tremendous opportunities for career development and advancement, and the satisfaction of making a difference in other people’s lives. It is also a mentally, physically, and emotionally, and demanding career. Nurses provide quality care with compassion to all patients, regardless of their attitude or condition. They perform physical duties for long hours, handle procedures involving bodily functions and close contact with patients, and make critical decisions in stressful situations that potentially affect a patient’s life. Finally, nurses work closely with others to communicate with patients and their families, especially with those under duress, as well as with nurses’ aides, physicians, and other health and social care workers.

Nursing also brings job security and a highly competitive salary. According to allnursingschools.com, nursing has a bright outlook for employment, with 587,000 new Registered Nurse (RN) jobs anticipated to open from 2006 to 2016 and a competitive salary averaging from $52,520 to $77,970. Nurses also have many opportunities for advancement from Advanced Practice Nursing to doctoral work in nursing with salaries usually ranging from $80,000 to $150,000.

To be successful, nurses must enjoy working with and care deeply about other people. If you see yourself in the profile of the nurse, then nursing may be a great fit for you.

Professional Opportunities:

Registered Nurse (RN)

The RN is the most common type of nurse and represents the largest healthcare occupation, with 2.6 million jobs. (Bureau of Labor Statistics http://www.bls.gov/oco/ocos083.htm). RN’s supervise Licensed Practical (or Vocational) Nurses and nursing assistants; assist physicians; manage administrative tasks; and provide direct care to patients. They are found in a wide variety of health-care settings, reflecting their vital role as care givers, leaders, and medical authorities.
This position requires a bachelor’s degree and successful completion of the NCLEX-RN. For more information about nurse licensure, consult the National Council of State Boards of Nursing (https://www.ncsbn.org/index.htm).

The salary for an RN varies according to geography, education, and experience, but the middle 50% of salaries ranges from $52,520 to $77,970.

*Nursing Specialties*
Some nursing positions require additional training and education beyond those required to become licensed as a Registered Nurse. The number of specialties are too numerous to list here, but they include such areas as acute, infectious, cardiovascular, geriatric, pediatric, school, and public health nursing. The following information is condensed and adapted from http://www.allnursingschools.com/nursing-careers/entry-to-nursing/nursing-careers-and-specialties.

*Advanced Practice Nursing*
To work as an Advanced Practice Nurse (APN), an RN goes on to earn a master’s degree. The APN provides medical care in ways once reserved for physicians. They serve in one of four roles: nurse practitioner, clinical nurse specialist, nurse-midwife, or nurse anesthetist. For more information, see http://www.allnursingschools.com/nursing-careers/.

- **A Nurse Practitioner (NP)** works in specific fields (such as family care, acute care, pediatrics, geriatrics, or psychiatrics, to name a few examples) to provide clinical health care, including writing prescriptions. On average, nurse practitioners earn $84,250, and the profession is projected to grow by 23% by 2016.

- **The Clinical Nurse Specialist (CNS)** focuses on specific populations and may focus on a particular disease. Compared to a nurse practitioner, a CNS has a more focused set of skills, focusing on one area of specialty and serving less as a clinician than as an administrator, researcher, policy-maker, educator and consultant. On average, CNS’s earn $80,975, and like other forms of nursing, the CNS is a rapidly growing profession.

- **The Certified Nursing Midwife (CNM)** specializes in delivering babies and providing prenatal and postpartum care to women. In addition, a CNM provides family planning and birth control counseling, and normal gynecological services such as physical and breast exams, pap smears, and preventive health screening. On average, a CNM earns $90,119, and the profession expects to see a 22 percent increase in employment through 2018.

- **The Certified Registered Nurse Anesthetist (CRNA)** delivers anesthesia in the same manner as an anesthesiologist (MD) and works closely with surgeons, dentists, podiatrists and anesthesiologists. On average, a CRNA earns $154,188 and the field is expected to increase 22% between now and 2018.

*Doctoral Work in Nursing*
A doctoral degree in nursing is a significant commitment, requiring 4 to 6 years to complete, and it prepares a nurse for a career in health administration, teaching, clinical research, and advanced clinical practice. Doctoral programs emphasize research methods, history and philosophy of nursing science and leadership skills.
Accelerated (or Second Degree) Programs
Washington University students who want to pursue nursing can complete a non-nursing degree and then attend an Accelerated (or Second Degree) Program, which leads to a Bachelors of Science in Nursing in 12-16 months.

Accelerated (also called Second Degree or Fast Track) Programs are fast-paced, full-time, and year-round nursing programs for students who have completed a bachelor’s degree in a non-nursing field. Students complete coursework and clinical experience, preparing them to complete the National Council Licensure Exam (NCLEX) for licensure as an entry-level registered nurse.

Although earning a non-nursing degree and attending an Accelerated Program takes more time than directly completing a BSN at a university with a nursing program, this pathway has many benefits. Like any number of professions, nursing has become increasingly complex and demanding, and it calls for highly-skilled and well-educated individuals. Nursing requires and rewards people who think critically; understand cultural differences; make sound judgments; and communicate clearly and effectively, all within a fast-paced, high-pressured environment. A non-nursing degree provides these skills and serves as the academic foundation for specialized areas of health care.

Application Process for Accelerated (or Second Degree) Programs

Requirements for an Accelerated Program
All Accelerated Programs require a bachelor’s degree, but they vary in terms of prerequisite courses and other admissions requirements.

The following is one example. Since schools vary in their prerequisites, students must research individual programs to determine what is required for admission. A typical program, the Goldfarb School of Nursing at Barnes-Jewish, requires a 3.2 cumulative undergraduate GPA and the following 24 credit hours with a C or better in each course:

- Anatomy and Physiology I with lab
- Anatomy and Physiology II with lab
- Microbiology with lab
- Nutrition
- Statistics
- General Psychology
- Human Growth and Development (across the lifespan)

Some but not all programs require clinical or volunteer experience. Even when programs do not require these experiences, students should seek them out to help them discern whether nursing is truly the path they want to pursue. Students should contact a Prehealth Advisor to explore shadowing prospects, informational interviews, internships, work experience, or volunteer opportunities.

Selecting an Accelerated (or Second Degree) Program

The first step is to identify programs that interest you. Look through the list of programs at http://acceleratednursingguide.com/accelerated-nursing-programs/schools-offering-accelerated-nursing-programs/.
Then consider the following criteria. Answers to these questions will help you develop a short list of programs to which you can apply.

- Is it accredited? (If not, look elsewhere.)
- What percentage of students passes the NCLEX-RN?
- Look for schools with a strong history of a high percentage (90% or higher) passing. For example, for Missouri schools, see [http://pr.mo.gov/boards/nursing/passrates.pdf](http://pr.mo.gov/boards/nursing/passrates.pdf). For Illinois schools, see [http://nursing.illinois.gov/PDF/IlApNursingEdProgPassRates01292010.PDF](http://nursing.illinois.gov/PDF/IlApNursingEdProgPassRates01292010.PDF)
- Is the program attached to a quality hospital where you will likely receive your clinical experience?
- What are the pre-requisites, and what will it take for you to complete them in a timely way?
- Where is it? Do you want to live there?

**Timing the Application**

Contact your school of interest to find out how early you can apply. Generally, you should apply for an Accelerated Programs well before completing your prerequisite work, in which case you would be accepted pending completion of that work.

At a program like Goldfarb School of Nursing at Barnes-Jewish Hospital, for example, students should apply as early as 1½ years before their intended start date.

**Accelerated or (or Direct-Entry) MSN Programs**

Students with a bachelor’s degree in a non-nursing field can also apply to programs that lead to a Masters of Science in Nursing. These programs typically allow a student to complete both a BSN and an MSN in 28-36 months, with one year leading to a BSN and two more years leading to an MSN. Many of these programs separate the BSN and MSN work so that a student who wants to stop with a BSN may do so.

Note that some MSN-level specialities (like the CRNA) require critical care work experience, so they would not be available to students earning the MSN through a Direct-Entry Program. Also, masters programs can be more valuable when students have several years of work experience as an RN upon which to draw and refer to.

The application process is largely the same as for the Accelerated BSN. For more information and a list of Direct-Entry Programs, see [http://www.bestnursingdegree.com/programs/direct-entry-msn/](http://www.bestnursingdegree.com/programs/direct-entry-msn/) or [http://www.allnursingschools.com/nursing-degree/masters/all-careers/missouri/saint-louis](http://www.allnursingschools.com/nursing-degree/masters/all-careers/missouri/saint-louis).

**Shadowing Opportunities**

Shadowing a nurse is an excellent way to get a first-hand look at the work nurses do and to see whether this career is a good fit for you. Washington University students can shadow a variety of different kinds of nurses at Barnes-Jewish Hospital. To arrange for a shadowing opportunity, contact the Prenursing Advisor on the Prehealth advising team.
**Paying for Nursing School**

Students generally pay their way through nursing school. Careful consideration of the profession and one’s interest and aptitude are necessary before embarking on this or any similar route.

Nevertheless, there are opportunities available to help defray the immediate cost in the form of scholarships, loans, work study, and loan forgiveness.


**Resources/Links**

- Best Nursing Degree, [http://www.bestnursingdegree.com/](http://www.bestnursingdegree.com/)
- Goldfarb School of Nursing at Barnes-Jewish, [http://www.barnesjewishcollege.edu/](http://www.barnesjewishcollege.edu/)

---

**Occupational Therapy**

The American Occupational Therapy Association executive board defines occupational therapy as the therapeutic use of work, self-care, and play activities to increase development and prevent disability. It may include adaptation of task or environment to achieve maximum independence and to enhance the quality of life. Occupational therapists (OTs) help people who have conditions that are mentally, physically, developmentally, or emotionally disabling improve their ability to perform tasks in their daily living and working environments. They also help them develop, recover, or maintain daily living and work skills. Basically, OTs deliver treatment that is focused on helping people to achieve independence in all areas of their lives.

**Professional Opportunities**

OTs work in a variety of healthcare and educational organizations, including: home health care services; nursing care facilities; offices of physical, occupational and speech therapists, and audiologists; general medical and surgical hospitals; and elementary and secondary schools

On a typical day an occupational therapist might:

- Assist clients in performing activities of all types;
- Use physical exercises to help patients increase strength and dexterity;
- Use activities to help patients improve visual acuity and the ability to discern patterns;
- Use computer programs to help clients improve decision-making, abstract-reasoning, problem-solving, memory, sequencing, coordination, and perceptual skills;
- Design or make special equipment needed at home or at work;
• Develop computer-aided adaptive equipment and teach clients with severe limitations how to use that equipment in order to communicate better and control various aspects of their environment.

Occupational therapists have the great fortune of having multiple practice areas to work in, such as physical health, mental health and community health. Within these practice areas, there are several other areas of specialities including but not limited to pediatrics, geriatrics, neurology, industrial rehabilitation, electronic assistive technology and vocational rehabilitation. In addition to the many specialities and practice options, occupational therapists may have opportunities for administration, research and education.

**Exposure to the Field, Shadowing, and Volunteering**
It is suggested that you contact local facilities that employ occupational therapists (e.g., hospitals, nursing homes, rehabilitation centers, or school systems). You can find these phone numbers in the Yellow Pages under Occupational Therapy or Rehabilitation. These requests are made quite frequently and you will find most facilities accommodating. Be prepared to discuss your reason for the request and your availability.

**The Application Process**
It is important that you contact the educational programs to which you are interested in applying and make sure you have taken the necessary prerequisites for admission into their programs. One must earn a master's degree or a more advanced degree in occupational therapy to work as an occupational therapist. To obtain a license, applicants must graduate from an accredited educational program and pass a national certification examination.

**Undergraduate Experience**
Biology, psychology, sociology, anthropology, and liberal arts are all appropriate college majors for those who ultimately want to earn a master's degree in occupational therapy. Specific requirements vary by program. The 3/2 program in OT at WU requires you to complete physiology and an upper-level biology course (many students take the two-semester Anatomy & Physiology sequence and an upper-level biology course offered in University College, which do not have a chemistry pre-requisite), abnormal psychology and developmental psychology, another social science course, and statistics.

**Degree Offerings**
Both Master’s and Doctoral degrees are currently routes of entry to the profession and are accredited by the Accreditation Council for Occupational Therapy Education (ACOTE). Both degree levels prepare graduates to be entry-level practitioners; however, students must hold a baccalaureate degree for admission into the doctoral program. Master’s degree programs may offer an MOT, MA, or MS degree. All are considered entry level degrees, although the MOT is more commonly used to designate an entry-level degree.

The doctoral degree offers additional semesters of study focusing on clinical practice skills, research skills, administration, leadership, program and policy development, advocacy, education, and theory development. Both degree levels require Level I and Level II fieldwork experiences. In addition, doctoral students must complete an experiential component (16 weeks) and culminating project.
Specialization
All entry-level educational programs prepare you to be a generalist. Specializing in one area of practice would be something you would pursue after you graduate and successfully pass the national certification examination. Many practitioners do select a specialty area of practice. Others change their area of practice throughout their careers. Occupational therapy provides a great deal of career flexibility.

Resources/Links

Optometry
Optometrists, doctors of optometry, or ODs, are the main providers of vision care. They diagnose vision problems and test patients' depth and color perception and ability to focus and coordinate the eyes. Optometrists may prescribe eyeglasses or contact lenses, or they may provide specialized treatments like vision therapy or low-vision rehabilitation. Optometrists also test for eye diseases and diagnose conditions caused by systemic diseases such as diabetes and high blood pressure. They can prescribe medication to treat vision problems or eye diseases, and some provide preoperative and postoperative care to cataract and laser eye surgery patients.

A career as an optometrist can offer a great deal of freedom than other professions, since often they are independent practitioners. Work hours are often regular and reasonable and the job is not physically demanding.

Optometrists should not be confused with ophthalmologists. Ophthalmologists are physicians who have graduated from medical school and have completed a residency in ophthalmology. Ophthalmologists perform eye surgery, as well as diagnose and treat eye diseases and injuries. Like optometrists, they also examine eyes and prescribe eyeglasses and contact lenses.

Professional Opportunities
Most optometrists are general practitioners in either an independent or group practice. Private practitioners would also be responsible for the business aspects of running an office and hiring personnel. Other places for employment would include hospitals, in the public health sector like community health centers, military organizations like the Department of Veteran Affairs, the corporate/industrial environment, and even in research and teaching.

Exposure to the Field, Shadowing, and Volunteering
Schools of optometry encourage prospective students to spend time shadowing or volunteering with a Doctor of Optometry. Not only will this experience confirm one’s decision in this career but it will also increase one’s knowledge of the profession. In addition to strong academic performance, students who display a sincere disposition to serving others and who have skills in interpersonal communication will be considered a well-rounded candidate. Thus participating in community service projects that serve to help others, vision-related or not, is recommended.
The Application Process
The American Schools and Colleges of Optometry (ASCO) uses a single web-based application called the Optometry Centralized Application Service (OptomCAS) that allows prospective students to apply to multiple schools. Additionally, most optometry programs also have their own supplemental applications. For more information about the OptomCAS, visit www.optomcas.org. Applications may include questions about the applicant’s own most recent eye exam.

Standardized Testing
All schools and colleges of optometry in the United States and Canada require the Optometry Admission Test (OAT). The OAT is a standardized, computerized examination designed to measure general academic ability and comprehension of scientific information. It consists of four tests covering Natural Sciences (Biology, General Chemistry, and Organic Chemistry), Reading Comprehension, Physics and Quantitative Reasoning.

A student can take the OAT an unlimited number of times but must wait at least 90 days between testing dates. However, only scores from the four most recent attempts and the total number of attempts will be reported. An applicant can take the OAT after at least one year of undergraduate coursework; however most take the OAT after two or more years of college education. For additional information on the OAT, call the Optometric Admission Testing program at 800-232-2159 or visit www.opted.org and click on “OAT – Optometry Admission Test.”

Undergraduate Experience
A bachelor’s degree is required by three schools and preferred for many of the other programs. Most students major in the natural sciences (biology, chemistry, etc.) because the prerequisites for optometry school are science intensive. However, prospective students can major in any degree as long as all of the prerequisite courses are completed.

Specialization
There are several areas of specialization in optometry that require an additional one-year in a clinical residency, after the completion of the four year O.D. program. Some examples would be low vision therapy for patients who are legally blind or developmental optometry for those who have suffered eye injuries, or have amblyopia (lazy eye) or strabismus (cross-eye). An occupational optometrist would focus on developing ways to protect workers' eyes from on-the-job strain or injury. Others may focus on pediatrics, sports vision, head trauma, or ocular disease.

Graduate Education
For a list of graduate programs and the schools and colleges of Optometry, go to Association of Schools and Colleges of Optometry – Graduate Programs, http://www.opted.org/i4a/pages/index.cfm?pageid=3600

Resources and Links
- Association of Schools and Colleges of Optometry (ASCO), http://www.opted.org
- American Optometric Association (AOA), http://www.aoa.org/
- Optometry Centralized Application Service (OptomCAS), www.optomcas.org
When people think of pharmacists, they think of the individuals that dispense drugs to patients from behind a drug store counter. While this is a critical part of what a pharmacist does, there are many interesting aspects of being a pharmacist. Pharmacists act as advisers to not only patients, but also doctors and other health care professionals about selection, dosages, interactions and side effects of medications.

Professional Opportunities
Pharmacists may work in a variety of settings, including hospitals, where they may custom mix medication solutions for intravenous use (e.g. cancer treatment, nutritional therapy). Some pharmacists are involved in doing research for pharmaceutical manufacturing companies, and some are professors, educating future pharmacists. Pharmacists are poised, at the front lines of medicine, making an immediate, critical impact in health care outcomes of individuals as well as populations.

Some clinical pharmacists in retail community drugstores or hospitals. Some pharmacists may own their own community pharmacy and may be involved in managing and overseeing all aspects of the business. Some community pharmacists provide specialized services to help patients with conditions such as diabetes, asthma, smoking addiction and high blood pressure. Many pharmacists are trained to administer vaccines. Pharmacists in hospitals dispense medications, prepare intravenous solutions containing medications, and plan, monitor and evaluate drug programs and regimens. Pharmacists who work in home health care monitor drug therapy and prepare solutions for use in the home setting, including total intravenous nutrition. Pharmacists also work in pharmaceutical research, developing new drugs and testing their effects and potential side effects. Some pharmacists work for insurance companies, helping to develop pharmacy benefit packages. Other pharmacists might work for the government, managed care companies, public health organizations, the armed services or pharmacy associations.

Exposure to the Field, Shadowing, and Volunteering
Pharmacy colleges encourage, and some may require, applicants to have volunteer or paid experience working in a pharmacy or health-related setting; this work may play an important factor in the admissions process. If you are unable to gain work or volunteer experience directly related to pharmacy on your own, contact your selected pharmacy school admissions offices to determine what experiences they might consider would adequately demonstrate your knowledge of the profession.

The Application Process
Timeline
Most Pharmacy schools and colleges accept students right out of high school into a six-year program that leads to a Doctor of Pharmacy degree. However, as space is available, most schools will accept transfers into their programs, typically in the third year, from accredited colleges and universities.

Undergraduate Requirements
Students who enter pharmacy programs after attending college are not required to have completed a bachelor’s degree program, but some pharmacy programs give preference to
students who earned a bachelor’s. No specific major is required, as long as prerequisite courses are all taken. Contact your designated pharmacy programs directly to determine whether the admissions office distinguishes between classes taken at a community college versus a four-year institution. The Pharm.D. degree requires at least two years of undergraduate study and most student pharmacists complete three or more years of college before starting a pharmacy program. The following is a list of classes typically required of transfer students:

<table>
<thead>
<tr>
<th>Classes Required of Transfer Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two semesters of English</td>
</tr>
<tr>
<td>Two semesters of General Chemistry</td>
</tr>
<tr>
<td>Two semester of General Biology</td>
</tr>
<tr>
<td>General Sociology</td>
</tr>
<tr>
<td>General Psychology</td>
</tr>
<tr>
<td>Calculus</td>
</tr>
<tr>
<td>Anatomy I and II with Labs</td>
</tr>
<tr>
<td>Physiology I and II with Labs</td>
</tr>
<tr>
<td>Physics I and II with labs</td>
</tr>
<tr>
<td>World/Western Civilization or World</td>
</tr>
<tr>
<td>History I and II</td>
</tr>
</tbody>
</table>

Contact your designated pharmacy programs directly to determine whether the admissions office distinguishes between classes taken at a community college versus a four-year institution. Some school specific information is also available on the PharmCAS site, [www.pharmcas.org](http://www.pharmcas.org).

Some pharmacy schools do give preference to students who have earned a bachelor’s degree. Individuals who hold a bachelor’s or other advanced degree must still complete all four academic years (or three calendar years) of professional pharmacy study.

**GPA**

Most pharmacy schools have a minimum grade point average (GPA) and test score requirements. Visit the school information pages on the PharmCAS Web site for the expected GPA of accepted students and minimum overall GPA considered at each PharmCAS school, [http://www.pharmcas.org/collegesschools/schoolpagesPARTinstitution.htm](http://www.pharmcas.org/collegesschools/schoolpagesPARTinstitution.htm).

*The Pharmacy College Admission Test*

The Pharmacy College Admission Test (PCAT), [http://www.pcatweb.info/](http://www.pcatweb.info/), is a specialized test that helps identify qualified applicants to pharmacy colleges. It measures general academic ability and scientific knowledge necessary for the commencement of pharmaceutical education. The PCAT is constructed specifically for colleges of pharmacy. The PCAT consists of approximately 240 multiple-choice items and two writing topics. Candidates are given approximately four hours to complete the test (plus administrative time for instructions and time for a short rest break about halfway through the test).

The six content areas measured by the PCAT include: verbal ability, biology, reading comprehension, quantitative ability, chemistry and a written essay. The test is divided into six subtests, including an experimental element.

More than 75 percent of all pharmacy programs require applicants to submit scores the Pharmacy College Admission Test (PCAT). To determine which colleges and schools require the PCAT, review Table 9 of the Pharmacy School Admission Requirements (PSAR) handbook. Minimum PCAT scores may be required for admission consideration.

*The Application*

Approximately two-thirds of all pharmacy degree programs in the U.S. participate in the Pharmacy College Application Service (PharmCAS) for admission. You should visit
thePharmCAS Web site to learn more about the admissions process and requirements.

Letters of Reference
Many pharmacy degree programs require 1-4 letters of recommendation as part of the pharmacy admissions process. Schools may require you to submit letters from particular individuals, such as a pharmacist, professor or academic advisor. Review the admission requirements of each pharmacy school for instructions.

Interviews
Pharmacy schools will require competitive applicants to visit the campus for an interview. The interview format varies by institution. Pharmacy admission officers may require you to speak with a single faculty member, a student, a pharmacist, or a panel of interviewers. If invited, you should be prepared to discuss why you have chosen to pursue a career in the pharmacy profession and how you perceive the role of the pharmacist in healthcare. Those who have researched and gained direct exposure to the profession will be better prepared to respond to the interview questions. During these interviews, you may be rated on your oral communication skills, how you present yourself and interact in a group, your knowledge of the profession of pharmacy, your ability to solve problems, and your motivation to pursue a career in pharmacy. Your written communication skills may be measured with an on-campus essay exercise.

Resources/Links
- Pharmacy College Application Service (PharmCAS), http://www.pharmcas.org/

Ph.D. Programs

The Doctor of Philosophy or the Ph.D. is the highest degree received in graduate study. This degree involves the pursuit and creation of new knowledge with the intention to share it, have it challenged, and tested. Individuals can pursue the Ph.D. in virtually any field. We will focus on the Ph.D. in biomedical sciences or basic science research. This pathway allows individuals to gain a deeper understanding of how organisms and systems work at the cellular and molecular level.

The deeper understanding of organisms and systems at the cellular and molecular level is the foundation for the development of important discoveries in the diagnosis and treatment of disease. Undergraduates who are curious and interested in being on the cutting edge of medical research would find this career pathway rewarding. Additionally, Ph.D. programs in the biomedical sciences **provide full tuition and a stipend for all students** making satisfactory progress in the program.

Professional Opportunities
The field of research is broad and varied. A Ph.D. program trains an individual how to think critically about problems and solve them in an efficient and effective manner. This training can be applied to many different areas and careers. Individuals with the Ph.D. can work in academia as administrators, deans, program directors, presidents and chancellors. Many run their own labs
and supervise and mentor graduate and undergraduate students. Others with a Ph.D. in the biomedical sciences work in industry developing consumer products or materials.

Exposure to the Field, Shadowing, and Volunteering
Students interested in pursuing the Ph.D. in the sciences should plan to conduct research in at least 2 of the 3 summers as an undergraduate to strengthen the graduate school application. Washington University offers the Biomedical Research Apprenticeship Program (BioMedRAP). This is a 10-week summer research programs for students interested in pursuing biomedical research careers and prepare them for top-quality Ph.D. and M.D. /Ph.D. programs. There are many other programs across the country that will provide this type of experience including the National Institutes of Health (NIH).

The Application Process
Completing a Ph.D. program in the sciences takes 3 to 6 years beyond undergraduate bachelor’s degree. Graduate education in the biomedical sciences involves intensive basic science research. This type of research does not involve human contact but rather test tubes, microscopes and imaging technology. The first year or two in a Ph.D. program in the sciences are coursework and lab rotations. After required course work has been completed, students take a preliminary, or qualifying, examination. The purpose of the exam is to assess the student's mastery of the particular field and ability to complete the program. The remaining years in the program the trainee will work in the lab refining his or her skills as an independent scientist.

Undergraduate Experience
A strong academic foundation in your proposed area of study is important. Successful application to graduate school requires compelling letters of recommendation from faculty in your field. These same faculty are in the best position to advise you about recommended coursework.

Standardized Tests
PhD programs require a Graduate Record Examination (GRE). International students must submit the Test of English As A Foreign Language (TOEFL).

Resources/Links
- Division of Biology and Biomedical Sciences (DBBS) Summer Research Programs at Washington University in St. Louis, http://biomedrap.wustl.edu/
- The Division Of Biology & Biomedical Sciences, http://dbbs.wustl.edu/

Physical Therapy
Physical therapy is an exciting, rewarding, and important health profession that applies scientific principles to prevent and remedy problems in human movement. Undoubtedly you have already been exposed to physical therapy in one way or another. Perhaps you or someone you know has sought physical therapy for rehabilitation after an injury, or has increased relieved lower back pain through therapeutic exercise. Maybe you know of an individual who has regained the ability to walk following a stroke, or another who has increased muscular endurance for maximum performance in athletics.
Doctors of physical therapy specialize in diagnosis, treatment, and prevention of musculoskeletal and neuromuscular disorders that can impair or prevent normal physical function. Trained to understand, detect, treat, and remedy a vast array of movement dysfunction, physical therapists employ basic and clinical science to relieve pain, to enhance strength, endurance, coordination, flexibility, joint range of motion, and to provide training for mobility and independence in the home and throughout the community.

**Professional Opportunities**
Doctors of physical therapy focus on movement disorders by understanding the body's musculoskeletal composition and by thoroughly examining the underlying components of cardiac, pulmonary, neurological and musculoskeletal activity effecting the manner in which we function. With this knowledge, doctors of physical therapy are then able to design responsive and proactive therapeutic programs that will treat or prevent movement dysfunction quickly, accurately, and independently. Because of their extensive training and the expressed need, physical therapists treat a variety of patients and clients, in multiple settings including hospitals, outpatient clinics, nursing homes, home care agencies, corporations, schools, and rehabilitation centers.

Therapists may elect to practice as generalists or they may choose one of a number of specialty areas. Some of the areas of specialty in which physical therapists may practice are the following:

- Orthopedics
- Geriatrics
- Neurology
- Pediatrics
- Sports physical therapy
- Cardiopulmonary

In addition to the many specialties and practice options, physical therapists have multiple opportunities in administration, research, and education.

**Exposure to the Field, Shadowing, and Volunteering**
Most PT programs require applicants to have experience in a physical therapy, with some requiring that those observation hours be verified by a licensed physical therapist. Volunteer experience as a physical therapy aide enables you to make informed career decisions and determine your future work environment.

**The Application Process**
*Undergraduate Requirements*
Prerequisites vary among programs. To be safe, check with the PT programs that you are interested in to see the specific requirements. In general, PT programs require courses such as anatomy and physiology, chemistry, physics, statistics, psychology, human development, kinesiology, organic chemistry, research methods, cell biology, and pathology and general biology. Other courses that may be required include English, social science, humanities, computers, medical terminology, and exercise physiology.
Degree Offerings
The Doctor of Physical Therapy (DPT) has become the standard in the field. The majority of DPT programs require students to enter with an undergraduate degree, though some will admit students after three years of undergraduate work, and a few admit students at the freshman level. Students are in the program between six and nine semesters. A small number of master’s programs in physical therapy still exist, but may be phased out in the future.

Extracurricular
Volunteer experience as a physical therapy aide, involvement in school and community activities (e.g. sports, clubs, social organizations), and a history of leadership are valuable to your future as a practitioner and the success of your application.

Letters of Recommendation
PT programs look for impactful letters of recommendation from physical therapists or science teachers and strong writing and interpersonal skills.

Standardized Testing
Some, but not all PT programs, require GRE and TOEFL scores. Consult individual programs to determine if you need to sit these examinations.

Resources/ Links
- Physical Therapy Degree Zone, http://physicaltherapydegreezone.com/

Physician Assistant

Physician Assistants (PAs) are health professionals licensed to practice medicine with physician supervision. PAs perform a wide range of medical duties, from basic primary care to high-technology specialty procedures. PAs often act as first or second assistants in major surgery and provide pre- and post-operative care.

Professional Opportunities
Physician Assistants perform medical functions that have previously been performed by licensed physicians, including but not limited to:

- Taking medical histories
- Treating illnesses
- Diagnosing illnesses
- Counseling patients
- Assisting in surgery
- Performing physical exams
- Ordering lab tests
- Promoting wellness

PAs have a long-standing tradition of serving in areas of need. They provide care to those who otherwise have little or no access to quality health care. PAs work everywhere from remote rural settings to major urban centers, in doctors’ offices, hospitals, clinics, HMOs, the armed forces, and other federal government agencies.
Exposure to the Field, Shadowing, and Volunteering
Most applicants to PA educational programs already have some health-related work experience; however, admissions requirements vary from program to program. Many PAs have prior experience as registered nurses, emergency medical technicians, and paramedics. Exposure to the field is critical to making an informed career decision.

The Application Process
There are more than 140 accredited PA programs located throughout the United States. They are generally affiliated with two- and four-year colleges and university schools of medicine or allied health. Most program application deadlines fall between November and March and most programs begin between May and September. A list of PA programs can be found on the Web site of the Physician Assistant Education Association (PAEA).

PA education includes classroom and laboratory instruction in subjects like biochemistry, pathology, human anatomy, physiology, clinical pharmacology, clinical medicine, physical diagnosis, and medical ethics. PA programs also include supervised clinical training in several areas, including family medicine, internal medicine, surgery, prenatal care and gynecology, geriatrics, emergency medicine, and pediatrics. Sometimes, PA students serve in one or more of these areas under the supervision of a physician who is seeking to hire a PA. The rotation may lead to permanent employment in one of the areas where the student works.

Undergraduate Experience
Programs offering master’s degrees require appropriate undergraduate credits with a minimum GPA and virtually all require previous health care experience. Suggested studies prior to applying to a PA program include:

- Anatomy
- Biological Sciences
- Chemistry
- College Math
- Computer Sciences
- English
- Humanities/Psychology
- Nutrition
- Organic Chemistry
- Physiology
- Social Science
- Statistics
- Medical Terminology

Resources/Links
- Physician Assistant Education Association, [http://www.paeaonline.org/](http://www.paeaonline.org/)
- National Commission on Certification of Physician Assistants, [http://www.nccpa.net](http://www.nccpa.net)
The American Podiatric Medical Association (APMA) describes doctors of podiatric medicine (DPMs) as clinicians who diagnose and treat conditions affecting the foot, ankle and related structures of the leg. Podiatrists are defined as physicians by the federal government and by most states. They are licensed by the state in which they practice. DPMs receive four years of graduate medical education comparable to medical doctors and two or three years of residency training. This field offers some of the same benefits as a career in medicine such as direct patient care, autonomy, intellectual challenge, high pay, and the opportunity to significantly impact a patient’s quality of life. For most podiatrists, the regular hours also allow for a good work-life balance.

**Professional Opportunities**
Podiatrists have a broad range of practice options open to them including pediatrics, dermatology, sports medicine, biomechanics, geriatrics, surgery or primary care. Many choose to go into private practice but other common practice settings include hospitals, clinics, health networks, assisted living facilities, and government agencies such as the US Public Health Service and the Department of Veteran Affairs.
On a daily basis podiatrists treat foot and ankle conditions of patients with chronic illnesses such as diabetes, arthritis, obesity, heart disease, and peripheral arterial disease. Good podiatric care may prevent complications from resulting from these conditions. Podiatrists may be involved in treating a wide range of other problems including trauma, pediatric deformities, and heel pain. They can help patients become more mobile and participate in daily activities with greater ease.

**Fast Facts about the Foot from APMA**
- Each foot has 26 bones – both feet contain nearly one quarter of all the bones (206) of the body.
- Each foot is made up of an intricate network of over 100 tendons, ligaments, and muscles.
- Every step places 1.5 times your body weight of pressure on your foot (a 150-pound person places 225 pounds of pressure on the foot with every step).
- The average person walks 5,000 to 7,000 steps a day. The American Podiatric Medical Association (APMA) estimates that the average person will walk nearly 100,000 miles in a lifetime, between three to four times the earth’s circumference.

**Exposure to the Field, Shadowing, and Volunteering**
Some programs will not accept an applicant who has not visited a podiatric practice. A letter of recommendation from a Doctor of Podiatric Medicine is commonly required to apply. You can use the DPM Mentor Network at [http://www.aacpm.org/contactpod/default.asp](http://www.aacpm.org/contactpod/default.asp) to find podiatrists and current podiatric medicine students who are willing to discuss their career choice with prospective students.

**The Application Process**

**Undergraduate Experience**
Any undergraduate major can be studied but students should also incorporate the standard premedical lab science core courses into their curriculum. Courses in cellular and molecular biology, microbiology, anatomy, physiology, genetics, biochemistry and psychology are commonly recommended to provide additional background.

**Application Service**
There are nine colleges of podiatric medicine. Applications are coordinated by the AACPM Application Service [http://www.e-aacpmas.org/](http://www.e-aacpmas.org/) which opens in August. Interviews may be held from September until May, although it is advantageous to apply early in the cycle.
Extracurricular
AACPMAS allows students to enter information about their shadowing, work, volunteer and other extracurricular activities. It is important to shadow a DPM and have sufficient exposure to the field to acquire an understanding of the role of podiatric physicians within medicine today. Community service and leadership activities are favorably regarded.

Letters of Recommendation
Most programs require two to four letters of recommendation, to include a letter from a Doctor of Podiatric Medicine and at least one letter from a science instructor.

Standardized Testing
The MCAT is required. Some schools may accept the DAT on case by case basis; check with each admission office before applying.

Resources/Links
- American Association of Colleges of Podiatric Medicine (AACPM), www.aacpm.org 1-800-922-9266

Public Health
Public health is a diverse and dynamic field. It is an approach to medicine that is concerned with the health of a community or population as a whole. This is in comparison to a clinical healthcare professional whose goal is to treat an individual’s health problems. The field of public health challenges its professionals to confront complex health issues, such as improving access to health care, controlling infectious disease, and reducing environmental hazards, violence, substance abuse, and injury.

Working in the field of public health offers great personal fulfillment. Seatbelt laws, flu vaccines, and fluoride in our drinking water are all achievements that fall under the auspices of public health. Public health debates are in the news every day, whether it be the latest outbreak of swine flu or the eradication of trans-fats from entire cities.

There are three core public health functions:
- The assessment and monitoring of community and population health to identify risk factors for health problems
- The development of public policies created to address local and national health problems
- The assurance that all populations have access to safe and appropriate healthcare

Public health is a field geared toward serving others. Public health professionals serve local, national, and international communities. They are leaders who meet the many exciting challenges in protecting the public's health today and in the future.
Professional Opportunities

A MPH degree provides innumerable opportunities with multiple specializations within the five core disciplines in a master's of public health degree program.

- Environmental Health
- Epidemiology
- Biostatistics
- Behavioral Health
- Health Services Administration or Management

A career in Environmental Health is focused on how human health can be affected by the natural environment. Biostatisticians and epidemiologists use mathematics and modeling in studying disease and injury in society. Behavioral health professionals address the behavioral, social, and cultural factors related to an individual or population. Health administration professionals combine politics, business and science in managing the resources needed to deliver public health services. Public health professionals come from varying educational backgrounds and can specialize in an array of fields. A hot of specialists, including teachers, journalists, researchers, administrators, environmentalists, demographers, social workers, laboratory scientists, and attorneys, work to protect the health of the public.

Exposure to the Field, Shadowing, and Volunteering

There are many options for individuals who are looking to get experience before applying to a school of public health:

- working part-time or full-time at a hospital or health clinic, such as working on an immunization program, a reproductive health clinic or a health promotion program.
- volunteering for a non-profit direct services organization such as a Whitman-Walker clinic or a local chapter of the American Red Cross.
- working at a non-profit organization that is directly involved in public health advocacy and policy.
- working or volunteering for a local health department.
- taking an internship at a U.S. federal agency via the Student Educational Employment Program.
- exploring options provided by public service organizations such as Peace Corps, AmeriCorps Idealist, Teach for America, or the Center for Disease Control.

Some schools have programs for future students that offer opportunities to get experience before applying to graduate school, so it is advisable to also contact schools of public health directly to inquire about such programs.

The Application Process

While schools of public health look for high graduate entrance exam scores and GPA, other aspects of an applicant's record, such as a career achievement, professional experience, and clarity of career goals, are equally important. Admissions decisions are based on an overall assessment of the ability of applicants to successfully complete the degree track area selected. Each program or track within a given department may set additional requirements for admission; therefore, applicants should refer to the individual programs for details.
### Degrees Available

#### Master Degrees

<table>
<thead>
<tr>
<th>Degree</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHA</td>
<td>Master of Health Administration</td>
</tr>
<tr>
<td>MHS</td>
<td>Master of Health Sciences</td>
</tr>
<tr>
<td>MPH</td>
<td>Master of Public Health</td>
</tr>
<tr>
<td>MPHE</td>
<td>Master of Public Health Education</td>
</tr>
<tr>
<td>MS</td>
<td>Master of Science</td>
</tr>
<tr>
<td>MSPH</td>
<td>Master of Science in Public Health</td>
</tr>
</tbody>
</table>

#### Doctoral Degrees

<table>
<thead>
<tr>
<th>Degree</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DrPH</td>
<td>Doctor of Public Health</td>
</tr>
<tr>
<td>PhD</td>
<td>Doctor of Philosophy</td>
</tr>
<tr>
<td>ScD</td>
<td>Doctor of Science</td>
</tr>
</tbody>
</table>

#### Joint Degrees

<table>
<thead>
<tr>
<th>Degree</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA/MPH</td>
<td>Master of Arts/Master of Public Health</td>
</tr>
<tr>
<td>MPH/JD</td>
<td>Master of Public Health/Juris Doctorate</td>
</tr>
<tr>
<td>MPH/MBA</td>
<td>Master of Public Health/Master of Business Administration</td>
</tr>
<tr>
<td>MPH/MD</td>
<td>Master of Public Health/Medical Doctor</td>
</tr>
<tr>
<td>MPH/MID</td>
<td>Master of Public Health/Master of International Development</td>
</tr>
<tr>
<td>MPH/MPA</td>
<td>Master of Public Health/Master of Public Administration</td>
</tr>
<tr>
<td>MPH/MSN</td>
<td>Master of Public Health/Master of Science in Nursing</td>
</tr>
<tr>
<td>MPH/MSW</td>
<td>Master of Public Health/Master of Social Work</td>
</tr>
<tr>
<td>MPH/PhD</td>
<td>Master of Public Health/Doctor of Philosophy</td>
</tr>
</tbody>
</table>

[Association of Schools of Public Health](http://www.asph.org/document.cfm?page=726)

### Selecting an undergraduate major

In general, there is no one recommended undergraduate major for students intending to apply to a school of public health. Students of public health come from a variety of educational backgrounds. Some MPH core areas programs may require or prefer specific prerequisites. It is important for applicants to refer to specific programs for admission details.

### Application

Most programs will require a cumulative undergraduate GPA of a B or better. Your application will consist generally of a personal statement describing your interest in and potential for contributing to the
field, a resume, a transcript and 3 letters of recommendation from academic or professional references. Most will require one standardized test (e.g., GRE, MCAT, GMAT).

*Getting Public Health Experience*
Most schools do accept students without prior work experience; however, all schools look favorably on applicants who have at least a little experience. Whenever possible, it is recommended to gain some experience in the field before applying to schools of public health.

*Resources/Links*

---

Social work’s roots are in affecting change. The field of social work is both a profession and a social science. It involves the application of social theory and research methods to study and improve the lives of people, groups, and societies. It incorporates and utilizes other social sciences as a means to improve the human condition and positively change society’s response to chronic problems.

Social work is a profession committed to the pursuit of social justice, the enhancement of the quality of life, and the development of the full potential of each individual, group and community in society. It seeks to simultaneously address and resolve social issues at every level of society and economic status.

*Professional Opportunities*
When most people think of social workers, they think of *case workers*: people who represent low income or disenfranchised members of society. And while this is one aspect of social work, it’s important not to get tied up with the term. Social workers enter many different fields. Here are just a few:

- Medical Social Work
- Community Development
- International Development
- Counseling: Therapist in private practice, School Social Work, Hospice Work
- Gerontology
- Social Services or Health Care Agency Management

Professional social workers are generally considered those who hold a professional degree (master’s) in social work and often also have a license or are professionally registered.

*Exposure to the Field, Shadowing, and Volunteering*
Internships and other community service activities are highly valued by social work admissions
committees. The more experience you have working with people, particularly in social service settings, the better off you will be. In addition, service provides you the opportunity to learn what type of social work environment motivates you. Consider getting involved in the Campus Y, a service fraternity, Habitat for Humanity, or some other service activity through the Community Service Office. Study abroad or living abroad also can be excellent experience for students to bring to the social work classroom.

The Application Process

Timeline

Priority deadline for scholarships are January 1 for fall early decisions and March 1 for all other fall decisions.

Degree Offerings
- Master of Public Health (MPH)
- Master of Social Work (MSW)
- PhD in Social Work

If you have a BSW from a social work school accredited by the Council on Social Work Education, you are automatically eligible and considered for advanced standing, allowing you to complete your MSW in 16 months.

Undergraduate students currently attending Washington University may be eligible for our 3-2 program. The 3-2 program allows Washington University undergraduates to earn an MSW in addition to their bachelor’s degree with just one additional year of study.

Undergraduate Experience

The Council on Social Work Education requires that students have a human biology course in their undergraduate or graduate studies. The Brown School at Washington University will accept physiological anatomy, physiological psychology, physiological anthropology, human sexuality and others to meet this requirement.

Many schools require a statistics course with a grade of “B” or better.

Coursework that focuses on communication (written and verbal) and that trains you to think analytically will prepare you well for social work. Most social work students hold a bachelor’s degree in a liberal arts discipline such as psychology, sociology, women’s studies, anthropology, economics, political science, and other related fields. However, any undergraduate major is acceptable and welcome. Students come from a wide variety of backgrounds.

GPA

In order to be competitive for top social work programs, your undergraduate transcript needs to reflect a cumulative GPA of a 3.0 or better.

Standardized Testing

Some schools require a GRE score and others do not. You should contact the individual programs to which you are applying. While there is no minimum acceptable score, the most competitive applicants receive a minimum of 500 in the verbal and quantitative sections and 5.0 or above in the written analytical portion. The Brown School will consider the higher set of scores for an applicant who sits
for the examination more than once. In any case, test scores expire five years from the original test date. Applicants are strongly advised to sit for the examination no later than December 1 to allow sufficient time for their scores to reach us by the Jan. 2 program deadline. Applications with missing GRE scores cannot be reviewed.

The Application
The application generally consists of essays and personal statement describing your rationale for pursuing a MSW, your potential for the field, and social issues of concern to you. In addition, a resume and three letters of recommendation are normally required.

Resources/Links

Veterinary Medicine

Today’s veterinarians are the only doctors that are educated to protect both animals and people. They address the health needs of every species of animal and they play a critical role in environmental protection, food safety, and public health. Veterinarians are animal lovers and understand the value of animals in our families and society.

Professional Opportunities
Employment opportunities for veterinarians include such diverse areas as clinical practice, teaching, research, regulatory medicine, public health, and military service.

Private or Corporate Clinical Practice
In the United States, approximately two-thirds of veterinarians work in private or corporate clinical practice.

Teaching and Research
Veterinary college faculty members conduct research, teach, provide care for animals in the veterinary teaching hospital, and develop continuing education programs to help practicing veterinarians acquire new knowledge and skills.

Research veterinarians employed at universities, colleges, governmental agencies, or in industry (including pharmaceutical and biomedical firms) find new ways to diagnose, treat, and prevent animal health disorders. In addition to a veterinary degree, these veterinarians often have specialized education in fields such as pharmacology, toxicology, virology, bacteriology, laboratory animal medicine, or pathology.

Regulatory Medicine and Public Health
To prevent introduction of foreign diseases into the United States, veterinarians are employed by state and federal regulatory agencies to quarantine and inspect animals brought into the country.

Veterinarians serve in city, county, state, and federal agencies investigating animal and human disease outbreaks, the effects of pesticides, industrial pollutants, and other contaminants on animals and people
and also protect the health and safety of animals and people through their work in developing disease surveillance and antiterrorism procedures and protocols.

**Other Professional Activities**
Veterinarians can specialize in areas such as zoologic medicine, aquatic animal medicine, aerospace medicine (shuttle astronauts), animal shelter medicine, sports medicine, animal-assisted activity and therapy programs, military service, and wildlife medicine.

**Exposure to the Field, Shadowing, & Volunteering**
It is expected that a student interested in veterinary medicine will make every possible attempt to at least observe veterinarians in a variety of settings (large animal practice, small animal practice, research, wildlife conservation work, etc.) to acquire an overview of what the profession is all about. If you are interested, there are many opportunities for you to gain experience. Veterinary schools typically require that applicants log a significant number of observation hours and have at least one letter of recommendation from a practicing veterinarian whom the applicant has worked with. Therefore, it is important for you be proactive in obtaining exposure to the field. You may begin by volunteering at one of our local shelters or through Campus Y programs such as WAGS. Veterinary practices in your hometown or near campus may be open to having you volunteer with them; many applicants to veterinary school work as vet techs before they apply. Research at the zoo, and summer work or internships on farms or ranches can round out your animal exposure.

**The Application Process**
Each college or school of veterinary medicine establishes its own pre-veterinary requirements, but typically these include the same core pre-requisite courses that students preparing to study human medicine complete. It is recommended that students complete as much science coursework in their undergraduate studies as possible, especially in the biological sciences. A large percentage of veterinary medicine students have undergraduate majors in biology, but students with majors in fine arts, English, business, etc are accepted. You should check your state veterinary schools requirements early; some courses like animal nutrition that are commonly offered at schools with an agriculture college are not offered at WU. You may be able to schedule these courses in the summer. Check the University College listings as well; some courses that veterinary schools require, such as animal behavior, are offered there. You will also need to take the Graduate Record Examination (GRE).

Admission to veterinary school is highly competitive. There are presently 28 AVMA Council on Education accredited colleges/schools of veterinary medicine in the United States, four in Canada, and nine in other countries. Most state schools have only a limited number of seats available for non-resident (or “at-large”) students.

Most veterinary schools require applications through the Veterinary Medical College Application Service (VMCAS). For information about application requirements, applicant data statistics, and other admissions resources, visit www.aavmc.org/vmcas/vmcas.htm.

**Resources/Links**
APPENDIX C
ATTAINING ACADEMIC SUCCESS

1. GO TO CLASS.

2. READ THE SYLLABUS.

3. PAY ATTENTION to DEADLINES. The drop/add deadlines and change of grade status along with the last date to withdraw are listed in the front of Course Listings.

4. UNDERSTAND THE POLICY OF EACH INDIVIDUAL INSTRUCTOR. Be prepared in case of absences or missed exams. It is also essential to understand how to verify the authenticity for a particular absence.

5. ORGANIZATION and TIME MANAGEMENT are essential for academic success. Counselors in Cornerstone: The Center for Advanced Learning, (314.935.5970), will see students by appointment, and they conduct a number of scheduled workshops early in the term. The office is located in the northeast end of Gregg Hall. Check the Cornerstone web site.

6. TAKE ADVANTAGE OF RESOURCES. Many departments offer helps sessions, study groups, and tutors. Math study groups for Calculus 131 and 132, physics and chemistry study groups are available. Sign up at The Center for Advanced Learning in Cornerstone. Students are urged to form their own study groups in other areas. There is an evening math help desk in Cornerstone. Check the Cornerstone web site for schedule.

7. BUILD YOUR WRITING SKILLS. The staff at the Writing Center in Eads Hall offers general help with papers. The help ranges from choosing a topic to editing a final draft. Help is available on a walk in basis, as the traffic permits, or by appointment. More focused help, for the student with a specific writing problem, is available at The Center for Advanced Learning in Cornerstone. Appointments should be made early in the term. Scheduling gets tighter later in the semester.

8. GO TO THE LIBRARY. Students who learn where the library is and how to use it early in their careers have an edge. The staff is friendly and eager to help. They provide tours early in the term. Staff is always available for questions at the information desk. You may access several important medical journals and periodicals at the library. Many of them are on-line and available to you through the University network. The Law Library (not Olin) retains hard-copy issues of the New England Journal of Medicine.

9. VISIT FACULTY DURING OFFICE HOURS. Students are urged to take advantage of professors’ and advisors’ office hours. It is an opportunity to clarify material and to feel involved in the academic community. Pragmatically, it is also essential for someone to know you when you request that letter of recommendation.
APPENDIX D
MAJOR PROGRAMS FOR STUDENTS INTERESTED IN MEDICINE, DENTISTRY and VETERINARY MEDICINE

- MD/PhD must have a science major. A double major outside the sciences is possible for MD/PhD candidates with broad interests.
- Students who are not planning a biomedical research career may choose any major:

**The Science Major**

- Calculus I, II, and III are required for all science majors (with the exception of biology and the environmental studies natural science track). The math sequence begins in the first year for science majors.
- If you know that you are going to major in biology, you will begin the chemistry and biology sequences in the freshman year. Statistics or calculus in the first two years is strongly recommended.
- Chemistry majors begin the chemistry sequence the first year and may choose to do physics in the first or second year, or in the summer between the first and second years. You may begin the biology sequence in the first or second year. It is possible to delay physics until your third year, but it will limit your choice of courses within your chemistry major. You should discuss the options carefully with your academic advisor or with Dr. Linck (314.935.6521) in the chemistry department.
- If you plan to major in earth and planetary sciences or in the environmental studies natural science track, you will probably want to put chemistry and physics at the front of your schedule and pursue the biology sequence in the second half of your sophomore year and the junior year.
- Student majoring in mathematics begin with the calculus sequence in the freshman year and structure the remainder of the coursework as you wish within the guidelines for taking pre-professional examinations.
- Physics majors complete the math and physics sequence the first year and leave the chemistry and biology requirements for the second and third years of your undergraduate study.

**The Humanities or the Social Sciences Major**

Your schedule can be somewhat more flexible than the schedule for science majors for the required courses. Many of our students complete the pre-professional core, major in the social sciences or the humanities, and study abroad. Careful planning and time management are essential.

You should consult the individual department regarding your major’s available Writing Intensive courses (must be taken the junior or senior year) as well as your major’s senior capstone requirements and options.
APPENDIX E
Timeline for Applying to MD/MD-PhD Programs
https://www.aamc.org/students/download/175214/data/timeline.pdf

A.) Applying in 2 years

September
- Look through the Pre-Health Handbook
- Choose courses very carefully to meet premed requirements but avoid overload (grades are much more important than they were in freshman year)
- Keep your eyes peeled for Washington University premed announcements

October/November
- Meet with your advisor once and keep him/her abreast of your progress and problems.
- Take a look at the MCAT schedule online and plan when you will take the exam in the future

December
- Identify professors or teaching fellows from the fall semester that might be willing to write strong reference letters for you. Consider seeking letters of recommendation from individuals who knew you only during freshman year…before they forget you!

January
- Begin to plan summer experiences. Do you need more clinical exposure or laboratory work to round out your background? For potential MD/PhD candidates summer research planning as early as sophomore year is very important — contact your advisor if you have questions about this.

February/March
- Meet at least once with your advisor. Discuss summer plans: research? volunteer work? classes? etc.
- Actively set up summer experiences early in the semester before the mid-term crunch.

April/May/June
- Take a look at the AMCAS applications when it comes online just to be familiar.
- Obtain reference letters from any suitable professors or TAs
- Start reflecting on PIR questions over the summer.

B.) Applying in 1 year

September
- Create your PIR account and submit your PIR questions before September 15.

October
- Touch base with your advisor to bring him or her up to date on your plans. If you have any questions regarding course selection, contact your advisor early. Course decisions may be very important this year.

November
- Look at the current Pre-Health Handbook to check for changes from last year that might affect you. Review the current volume of the AAMC-MSAR (Medical School Admissions Requirements) text to familiarize yourself with its content.
- Think about whether you will benefit by taking a review courses to prepare for a spring MCAT. See Cornerstone for our in-house prep course information.
Appendix E: Timeline for Applying to MD/MD-PhD Programs (continued)

- Register for an MCAT course or buy MCAT study books.

**December**
- **REGISTER** for MCAT to be taken *before* April. You can find materials at [www.aamc.org](http://www.aamc.org)

**January**
- Touch base again with your advisor.
- Begin summer planning, finding the best way to spend (and finance!) your summer.
- Make good course selections for 2nd semester
- Make final contacts for letters of recommendation.

**February**
- Obtain a copy of the Medical School Admission Requirements handbook from the AAMC
- Complete a draft of your Personal Statement
- Compile an accurate list of advocates writing Letters of Reference
- Make a tentative list of medical schools
- Update your resume

**March/April**
- Continue *seriously* rounding up letters of recommendation.
- Continue working on AMCAS personal statement.
- Apply for the AMCAS fee waiver if you are eligible.

**May**
- Make sure you have taken the MCAT by this point so that you have the scores back before you apply.
- AMCAS Application becomes available the first week of May.
- Ensure that ALL RECOMMENDERS KNOW that recommendation letters should be submitted to the College Office. Recommenders may contact prehealth@artsci.wustl.edu with questions.
- Submit request for transcript to be sent

C.) **In the Year of Application**

**June**
- First week of June: AMCAS will begin accepting applications
- **Obtain and submit AMCAS Application -it’s never too early!!**
- Write to non-AMCAS schools to request applications.
- Check periodically to see if letters of reference have been submitted
- Draw up a flow grid or neat checklists to chart the process of each of your applications from initial contact through interviews. Organize-create a folder for each school.
- June 15: Suggested AMCAS submission date online

**July**
- Work on non-AMCAS and secondary application forms
- Save money for interview trips.
- Send polite ‘reminder’ letter to recommendation writers if letters are not in.

**August**
- All secondary application forms should be **finished** and sent off by mid-September.
- Sign up for a medical school mock interview through the career center.

**September**
- Begin calling schools to ensure that applications are complete.
Appendix E: Timeline for Applying to MD/MD-PhD Programs (continued)

- Chat with your advisors before heading off for interviews to review strengths and weaknesses in your application and how to deal with them.

**September - January**
- Interview season
- **Jan 30:** If no interviews are offered by this date, you should have a conversation with a pre-health advisor.

**February**
- Interviews continue into the spring semester. But if you do not receive any interviews, alternate plans should be considered. Talk to a pre-health advisor before re-applying.

**Mar-Jun**
- Acceptances mailed!
- Things to consider when choosing your school: quality, location, financial aid package, etc.
APPENDIX F

Many different arrangements and sequences of basic pre-requisite coursework lead to medical school, dental school and other science-intensive graduate professional programs.

Click here for examples.
APPENDIX G
Science Courses Outside BCPM Departments

BCPM (Biology, Chemistry, Physics, and Math) Courses

AMCAS 2013 Instruction Manual states on page 39:

Course Classification
Each course must be assigned a course classification based strictly on the primary content of the course.
The course classifications listed on the Course Classification Guide are bolded and are titled as they appear in the course classification drop-down list. The items beneath each bolded heading are examples of courses for which you should select that bolded course classification. You are responsible for selecting the correct course classification, but AMCAS reserves the right to change classifications if the assigned classification clearly does not apply. AMCAS is not responsible for incorrect GPA calculations resulting from incorrect course classifications. In the event that an applicant is unable to comfortably classify a course, AMCAS suggests that the applicant refer to the description of the course on the school’s website.

Course classifications, in addition to describing the courses you enter, are used in the calculation of your AMCAS GPAs. Classifications that are highlighted in the "BCPM" grouping indicate that these courses will be included when calculating your BCPM GPA, which is comprised of Biology, Chemistry, Physics, and Mathematics courses. Classifications not grouped in "BCPM" indicate courses that will be included when calculating your AO (All Other) GPA.

Applications are not returned for incorrect course classifications.

When AMCAS representatives have visited at Junior Jumpstart, students often ask if courses outside the biology, chemistry, physics and math departments can be designated as BCPM courses. The representatives consistently reply that courses must have content of 50% or more in biology, chemistry, physics or math to be designated as BCPM courses.

It may be obvious in some cases that this is so. You may, for example, be taking a math course that is not offered by the math department; other courses that are more interdisciplinary in nature may be difficult to evaluate. It is ultimately your responsibility to decide how to classify your courses on your application. Of course, having a strong science GPA is a good thing, but you do not want to be perceived as inappropriately inflating your science GPA with courses that are not really biology, chemistry, physics or math. Instead, your focus should be on taking courses that show you are fully centered on preparing yourself for medical school coursework.
APPENDIX H
MEDICAL SCHOOLS POLICY VARIATIONS REGARDING MATH REQUIREMENTS

51 schools require math but the type and amount varies. Check the MSAR to determine if the medical school:
- requires 1 semester of calculus
- requires 2 semesters of calculus
- requires two semesters of math (may include calculus, statistics, and/or other math)
- 3 require statistics specifically (Univ. of Cal, Irvine; Texas A & M; Texas Tech)

Determine if the medical school accepts AP Calculus AB or BC by emailing the School individually or check their web site (Their policy is not listed in the MSAR nor a table online.)
- ask if they accept AP Calc credit (AB or BC) and state your test score (27 do)
- ask if they accept AP Calc credit only if credit is listed on WU transcript (19 do)

Source: MSAR 2010-2011 Check with school for policy Compiled by Joan Downey MD MPH

APPENDIX I
MEDICAL SCHOOLS THAT REQUIRE BIOCHEMISTRY FOR MATRICULATION (not at application)

1. Keck School of Medicine Univ. of S. California 1 semester no lab
2. Univ of California Irvine 1 semester no lab
3. Florida State Univ. 3 hrs no lab
4. Univ. of Florida 4 hrs with lab
5. Univ of Hawai’i 3 hrs no lab
6. Univ of Michigan 3 hrs no lab
7. Mayo Clinic College of Med 1 semester no lab
8. Univ. of Nebraska 3 hrs no lab
9. Univ of New Mexico 3 hrs no lab
10. Oregon Health & Sci 1 quarter with lab
11. Univ. of Texas-San Antonio 3 hrs no lab
12. Univ. of Utah (new to this list) 1 semester no lab
13. Univ. of Wisconsin 1 semester no lab

*Univ of Minnesota no longer requires 1 quarter.

Source: MSAR 2010-2011 Check with school for policy. Compiled by Joan Downey MD MPH
APPENDIX J
MEDICAL SCHOOLS THAT REQUIRE MORE THAN 1 YEAR OF BIOLOGY
(Many schools recommend more than one year.)

1. Keck School of Medicine of the University of Southern California
2. University of California, Irvine College of Medicine
3. University of California, Davis School of Medicine
4. University of Illinois at Chicago College of Medicine
5. University of Iowa Roy J. & Lucille Carver College of Medicine
6. Michigan State University College of Medicine
7. University of Nevada School of Medicine
8. Oregon Health & Science University School of Medicine
9. Texas A & M University System Health Science Center College of Medicine
10. Texas Tech University Health Sciences Center School of Medicine
11. Paul Foster School of Medicine at Texas Tech University Health Sciences at El Paso
12. Univ. of Texas Medical Branch at Galveston
13. Univ. of Texas Medical School at San Antonio
14. Univ of Texas Southwestern Medical Center at Dallas Southwestern Medical Sch
15. Univ of Texas Medical School at Houston
16. Univ. of Utah School of Medicine
17. Univ. of Washington School of Medicine

Source: MSAR 2010-2011 Check school web site for updated information. Compiled by Joan Downey MD MPH
APPENDIX K
MEDICAL SCHOOLS THAT REQUIRE STUDENTS TO PRODUCE A WRITTEN RESEARCH THESIS DURING MEDICAL SCHOOL

Albert Einstein College of Medicine of Yeshiva University
Case Western Reserve University School of Medicine
Columbia University College of Physicians and Surgeons
Cooper Medical School of Rowan University
Duke University School of Medicine
Emory University School of Medicine
Florida International University Herbert Wertheim College of Medicine
Georgetown University School of Medicine
Harvard Medical School
Mayo Medical School
Meharry Medical College
Oakland University William Beaumont School of Medicine
Penn State Milton S. Hershey Medical Center College of Medicine
Raymond and Ruth Perelman School of Medicine at the University of Pennsylvania
Stanford University School of Medicine
Texas Tech University Health Sciences Center Paul L. Foster School of Medicine
UMDNJ-Robert Wood Johnson Medical School
University of Arizona College of Medicine
University of Central Florida College of Medicine
University of Chicago Division of the Biological Sciences The Pritzker School of Medicine
University of Colorado School of Medicine
University of Pittsburgh School of Medicine
University of Utah School of Medicine
University of Washington School of Medicine
Vanderbilt University School of Medicine
Virginia Tech Carilion School of Medicine
Yale University School of Medicine

Source: Medical School Admissions Requirements (MSAR)  Compiled by Joan Downey MD MPH
APPENDIX L
Applying to Health Professional School through Arts & Sciences
Pre-Health Letters & Personal Information Review (PIR) System

Account Registration
If you are an A&S, Olin or Sam Fox student, you will use the PIR system to store and send your letters of recommendation to the schools to which you apply.

To access the system that will be housing your recommendation letters & PIR materials, go to: http://pir.wustl.edu/PIR/. Be sure to add this site to your favorites as you will be accessing this account throughout the application process. You will need to “register” in order to log into the site. You cannot register unless you are using a wustl email address. If you do not have a wustl email account you may get one by visiting: http://emailaddress.wustl.edu/

Personal Account Information
The first time you login to the PIR system, you should complete your personal account information. Required fields in this section allow us to better serve you as an applicant. The most important thing to keep in mind is that if anything changes, you must update this information. For example, if you decide to take a gap year and no longer wish to apply in the cycle that you first indicated, you MUST update the year that you intend to enter graduate studies. This is how we know who is applying in any given application cycle; if you don’t update this section, you could be missed in the following year.

PIR Materials
When you have completed your PIR answers, List of Activities, Resume and Personal Statement, log into your account to upload them into the system. Once you have successfully uploaded them into your account, you are ready to set up a PIR appointment with your assigned Pre-Health Advisor.

Prehealth advisors are assigned in October to all students in the PIR system who can be expected to apply the following June, based on the “expected year of entry to graduate program.” If you missed being assigned a prehealth advisor update your personal account information and email prehealth@artsci.wustl.edu to request an advisor assignment.

Do not schedule a PIR appointment with your advisor until you have uploaded all of these materials. Your materials MUST be successfully uploaded at least 2 weeks prior to your appointment. If you have PreHealth related questions before you have finished your PIR, contact your prehealth advisor, visit any of the PreHealth Advisors during their walk-in hours: http://prehealth.wustl.edu/advising/Pages/default.aspx, or email your questions to prehealth@artsci.wustl.edu.

Also, make sure that you take advantage of the Personal Statement Workshops offered through Cornerstone: http://cornerstone.wustl.edu/AcademicPrograms/PersonalStatementWorkshops.aspx

You can and should be updating your PIR materials throughout this process. By the time your letters of recommendation have been received, you should feel confident that your materials represent you well. Our office will be using this information and the information we gather from your letters of recommendation to compose a cover letter on your behalf. This is not a committee letter. We do not rank our students. Our cover letter is meant to serve as a letter of introduction and institutional support for the students who apply through our process.

If you are reapplying, you will need to go to this page to upload information regarding what you have been doing since your last application cycle. This will allow us to update your existing cover letter. Be sure that you speak with a PreHealth Advisor before submitting your re-application so we can make sure that this is the best decision on your behalf. This will also make us aware that you will need an updated cover letter.
APPENDIX L (continued)

Letters of Recommendation and the PIR system
Login to your account, click on the link that says “Recommendation Letters”. This will take you to the page where you will enter your recommenders’ names and contact information. Once you have entered this information click on the button that says “Save”. If everything worked correctly the name of your recommender should still appear in the box and a link should pop up to the right hand side of your recommender’s information that says, “Click here to sign your confidentiality agreement waiver!” (This just allows you to print the waiver – we are not requesting your letters for you!)

Your next step is to click on this link that says “Click here to sign your confidentiality agreement waiver!” This will generate a waiver form for you. On this form you must do three things:

1. Select your Purpose: towards the top center of the page you will see a drop down box with different options. In most if not all cases you will select Medical School as your purpose. This tells your letter writer what your recommendation will be used for.

2. Select Confidential: it is important that here you click on “Confidential” to waive your right to see this letter. All letters sent on your behalf to medical schools are confidential and therefore by clicking on this you waive your right to future access.

3. Sign Waiver: You MUST click on the button that says “Sign Waiver” in order for us to accept your letters. Once you click on that button a page will be displayed that says, “ Recommendation Request Form signed! Click here to print for your recommender.” Follow that link and print your recommendation request form to give to your recommender, you may also save the form and send it to your recommender. However, we strongly encourage having a face to face meeting, if possible, when asking your recommender to write for you.

Once you have generated your recommendation request forms and given this information to your letter writers the most important thing to do is to be PATIENT!!

DURING THE SUMMER….WHAT HAPPENS AFTER WE RECEIVE THE LETTERS?

Once the letters are submitted to our office we will scan them into the system. Depending on the time of year it may take up to 2 weeks to get your letter scanned into the system. When the letter is scanned in two things will happen 1.) You will receive an email saying that your letter has arrived & 2.) When you login to your account and go to your Recommendation Letters page, if a letter has been received it will say in bold under, status “Recommendation letter Received”.

Wait for an email from the system saying that your cover letter is ready. We won’t write your cover letter until we have received at least 3 letters.

If letter writers have not submitted letters AFTER June 1, you can start attempting to politely nudge them. Don’t pester, though! You want them to be in a good mood when they write for you.

Once your cover letter is ready, you will use the PIR site to specify where you want your letters sent. There will be more information for you on this presented at Junior Jumpstart, so be sure to attend this session, too!

Cover Letters
Once your cover letter has been completed you will receive an email notifying you that your Cover Letter is complete. This email will have instructions on how to create your requests to submit letters through the PIR system.
APPENDIX L (continued)
Instructions for the Letters of Recommendation Section on AMCAS Application:

You should select the option "Letter Packet" when filling out your application. Your packet will include a cover letter signed by Dean Herman and the recommendation letters you designate. Please complete this section by listing the following address:

Dean Carolyn Herman
1 Brookings Drive
Cupples II, Suite 104
Campus Box 1117
St. Louis, MO 63130
prehealth@artsci.wustl.edu
314-935-6897

You will be prompted to enter additional authors. THIS IS OPTIONAL. You should NOT separately enter the individual authors that you will include in the packet. Most of you will send one packet to all schools, so you will only have one letter entry on AMCAS, and one AMCAS Letter ID number. If you have a letter that you will only send to a few schools and will not include in your standard packet, that will be a separate AMCAS entry and will have a second Letter ID number.

Your letters will all be sent electronically. You do not have to print out the Letter Request form but please keep it for your records. We will need your AMCAS ID and your Letter ID number in order to process your requests. This will all be handled through the PIR system.

If you need assistance or have questions about the PIR system, please contact Elizabeth Heidger at prehealth@artsci.wustl.edu.