

***INFORMATION FOR
PRE-MEDICAL
PRE-DENTAL
PRE-VETERINARY
STUDENTS
AT MERRIMACK COLLEGE***

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Janine M. LeBlanc-Straceski, Ph.D.

**Charlotte Berkes, Ph.D.
Health Professions Advisor
Assistant Professor
Department of Biology
Merrimack College
North Andover, MA 01810**

INTRODUCTION

Preparing for a successful professional career is a juggling act. There are three balls that you must keep up in the air in order to have a successful professional school application. Drop one and your application will fail. The three balls are 1. High GPA; 2. Exemplary record of extra curricular, service, research and clinical activities; and a high enough score on the required entrance exam. All of these areas are equally important. Being successful in only two out of three is the same as failing in all three.

Throughout their academic careers, students are aware of their academic standing and extracurricular dossier. The remaining unknown is how they will score on the entrance exam. Therefore, the Health Professions Advisory Committee requires students to have received their scores before they make the final decision to apply and before they solicit letters of recommendation and request a Committee Letter. This strategy saves both time and money for the applicant and the committee, and allows the applicant time to develop strategies to improve test scores, if necessary, before filing an application.

Table of Contents

To prepare to apply to a medical, veterinary or dental school you must...

- 1. Take the required courses.**
- 2. Get more than just a little clinical, service and research experience.**
- 3. Read as much as you can, all the time.**
- 4. Take the required entrance exam *before* your make your final decision to apply.**
- 5. Schedule your interview with the Health Professions Advisory Committee**
- 5. Solicit letters of recommendation and complete an application.**
- 6. Follow all the timelines and deadlines for Merrimack College in this handout!**

Also included are....

- 7. Some Very Helpful Links**
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1. Take the required courses

The Pre-Professional Curriculum

***** Please Note: As a result of a major overhaul of medical school education requirements, the MCAT will be changing drastically in 2015. This will undoubtedly be accompanied by a change in the medical school admission requirements. Stay tuned for more updates as they become available!!*****

The Pre-Med, Pre-Dent and Pre-Vet curricula can be categorized as liberal arts curricula that also include specific courses in biology, chemistry, physics and math to prepare students for their applications to those professional schools. No specific major is required to apply to any of these schools, however, many students do major in biology because of the overlap in courses and interest.

Contrary to a widely held belief, 50% of the matriculants into medical school are non-science majors who have completed all the course requirements for admission, as well as a major in a social science or humanities.

Whatever your major, entering a professional medical school requires the demonstration of a high level of academic achievement, emotional maturity and dedicated service.

For a successful application, students should strive for a minimum of:

- 33 on MCAT or equivalent DAT and GRE scores. This will require test taking skill preparation (*not* necessarily a paid course) in addition to reviewing the facts for the physical science and biological science portions of the test.
- GPA > 3.7
- several extracurricular activities at which you excel
- extensive volunteer work, laboratory research, internship and/or job related experience
- excellent reading and writing skills
- completion of specific course requirements for schools to which you apply

The average age of matriculants into medical school is now between 23 and 25. Dental and veterinary schools are similar. That means fewer and fewer students are accepted directly after graduation from their undergraduate institution. You should factor this into your plans. There are many possible paths to follow. After graduation, you should do something that enhances your life experience in a meaningful way, if not your experience in a biomedical or clinical setting.

Required & Recommended Courses:
Check with individual programs for specific requirements:

Pre-Med
 (MD, DO degrees)

Universally required:

Intro Bio I and II
General Chem I and II
Organic Chem I and II
**Physics I and II (algebra or
 calc based)**
**Two semesters of English
 composition**

**Commonly strongly
 recommended:**

Biochemistry I
Genetics
Statistics
Calc I
**Sociology and/or
 Psychology**

Pre-Dent
 (DMD, DDS degrees)

**Required Prerequisite Courses
 for the Boston University
 School of Dentistry:**

Biology One-and-one-half
 years with lab (12 semester
 hours). such as basic biology,
 genetics, embryology,
 molecular biology, cell biology

Biochemistry

Chemistry Two years with lab,
 general and organic chemistry.
 (16 semester hours).

Physics One year with lab (8
 semester hours)

English One year or the
 equivalent at the college level,
 even if the applicant received
 advanced placement credit or
 was exempted from English
 courses on entry into college

Mathematics One year (6
 semester hours). A basic
 understanding of calculus is
 needed

Social Sciences and Humanities
 Three years (18 semester hours)

Pre-Vet
 (DVM degrees)

**Schools vary widely in
 their requirements. What
 follows is an all purpose
 pre-vet curriculum:**

General Biology with
 laboratory (two semesters)

Biochemistry (one
 semester)

**Comparative Physiology or
 Zoology** with laboratory
Genetics (one semester)
Microbiology with
 laboratory

General Chemistry with
 laboratory (two semesters)

Organic Chemistry with
 laboratory (two semesters)

Physics (two semesters)

Mathematics (two
 semesters), calculus and
 statistics

English (two semesters)

**Social and Behavioral
 Sciences** (two semesters)

Humanities and Fine Arts
 (two semesters)

PLEASE NOTE THAT THWSW REQUIREMENTS WILL BE CHANGING!!!
 TO PREPARE FOR THE NEW MCAT, THERE WILL BE ADDITIONAL COURSES THAT
 STUDENTS SHOULD TAKE.

Sample of a Pre-Med Plan

ONGOING

- ***read all the time***
- ***get an MCAT (DAT, GRE) prep book and look at the sample exams on line early on in your academic career***
- ***investigate specific medical schools***
- ***get really good grades***
- ***get lots of clinical experience***
- ***distinguish yourself (research, sports, music, service)***
- ***check in with the HPA (Health Professions Advisor) periodically***

ACADEMICS

Freshman Year

Gen Chem 1+2
Intro Bio 1+2
Calc 1
Freshman English

Sophomore Year

Organic Chem 1+2
BioChem
Genetics
Philosophy
Writing

Junior Year

Physics 1+2
Comparative Physiology/ Cell
Biology/ Molecular
Biology/Microbiology (pre-vet)
Sociology
Fine Arts/ Humanities

Senior Year

Research and Seminar
Comparative Physiology/ Cell
Biology/ Molecular
Biology/Microbiology (pre-vet)
Fine Arts/ Humanities

TEST

Take MCAT (DAT, GRE) and ***then*** decide whether to apply to professional school, depending on score.

POST GRADUATE

Get some meaningful life experience to grow as a mature person. This will strengthen your application.

Contact the Merrimack College Health Professions Advisor to secure a committee letter, which is an endorsement of your application by the Health Professions Advisory Committee. Please note, this is a **requirement for application** to medical school.

2. Get more than just a little clinical, service and research experience.

This aspect of your dossier is a chance to distinguish your application. Although all the good applicants will have research experience, clinical experience, service experience and extra curricular experience, the set of activities in which you become involved will be unique to you. The important things to keep in mind is that these experiences both reflect your personality and shape your character. They mold your character and philosophy of life. They provide fodder for your personal statements and for letters of recommendation that others will write for you. Choose well and invest your time and energy into them. You will be investing in yourself.

It is important to some get clinical experience with direct patient care. Your experience should be able to generate a letter of recommendation from a direct supervisor. If you intend on applying to osteopathic medical schools, you will need a letter of recommendation from an osteopathic physician you have shadowed or for whom worked or volunteered. If you are heading to veterinary school, you will need extensive clinical experience with animals, and a letter from a veterinarian.

3. Read as much as you can, all the time. (Suggested reading lists are included.)

Professional schools seek out articulate, erudite, worldly individuals. If this does not describe you, you can become these things, but you must put in the effort. You must turn off the TV, iPod, PSP, YouTube and limit texting and cell phone use. You must read, read, read all the time. Embrace all opportunities to write. Take courses that force you to read and write extensively.

4. Take the required entrance exam before your make your final decision to apply.

MCAT, DAT, GRE: The Make or Break Tests

There are three balls that you must keep up in the air in order to have a successful professional school application. Drop one and your application will fail. The three balls are 1. high GPA; 2. exemplary record of extra curricular, service, research and clinical activities; and 3. a high enough score on the required entrance exam. All of these areas are equally important. Being successful in only two out of three is the same as failing in all three.

That is why the Health Professions Advisory Committee requires students to have received their entrance exam scores before they make the final decision to solicit letters of recommendation and request a Committee Letter and apply to professional school. This strategy saves all parties valuable time and money!

Sample MCAT Scores

Very Good:

MCAT Test Date	VR	PS	WS	BS	Total	Special Accommodations?	Format
18-JUL-2008	10	14	Q	11	35Q	No	C

Safe:

MCAT Test Date	VR	PS	WS	BS	Total	Special Accommodations?	Format
22-MAY-2009	11	09	Q	13	33Q	No	C

Bad:

MCAT Test Date	VR	PS	WS	BS	Total	Special Accommodations?	Format
14-AUG-2009	06	05	M	08	19M	No	C
22-MAY-2009	02	06	N	06	14N	No	C
02-MAY-2009	03	06	M	04	13M	No	C
13-SEP-2008	05	05	Q	06	16Q	No	C
10-JUL-2008	04	03	O	01	08O	No	C

As for the DAT

Generally speaking, students with AA of 19 and TS of 19 (and no section less than 17) topped off with 3.5+ GPA and Science GPA is the ideal recipe for an acceptance letter.

- 17- you can apply
- 18- not bad
- 19- avg acceptance score...
- 20- an attention getter
- 21-23- you killed it
- +24- pick your school to interview

And as for the GRE for Vet School, here is an excerpt from the University of Pennsylvania web site...

6) What is the average GPA of a successful applicant?

The average GPA for the 2010 entering class was 3.63.

7) Is there a standardized test to be taken?

Yes, the Graduate Record Exam (GRE) is the test required for our school. The GRE reporting code for Penn Vet is 2775. The average verbal score is about 566 and the average quantitative score is about 725. We do not use the analytical score, and thus do not require the writing sample. When considering scores from multiple test dates, we will take the highest combined verbal and quantitative scores from the same test date.

8) What should my major be in college?

Your college major should be in an area of interest [to you]. Although about 85 percent of our applicants are science majors, it is not required. However, a series of science courses including chemistry, physics and biology are required by all applicants. Every year, we have students entering with degrees in language, history, business, fine arts, music and so forth. All of them have proven their ability to successfully complete science courses.

9) I have heard that I need veterinary experience as part of my application. What kind of experience do I need?

It is important for every applicant to understand the practice of veterinary medicine. Volunteering or working in a veterinary clinic will help you realize there is far more to veterinary medicine than just animals. The kind of practice depends on your interest area. If you are small-animal oriented, then you should work in a small-animal setting. If it is large animal, then your choice should be a large-animal practice. If you are curious, then try both or volunteer at a zoo or a wildlife rescue organization. If research is of interest to you, then get involved in a research project at your college or university. A minimum of 500 hours is recommended.

12) What are the prerequisite courses required for admission to Penn Vet?

The following courses are required of all applicants to enter the school:

- General chemistry + labs = two semesters
- Organic chemistry + lab = one semester
- General physics + labs = two semesters
- Three biology courses of your choice, one of which should provide the basics of genetics
- One semester of calculus
- One semester of biostats or math stats
- Two English courses (including one composition course)
- Two behavioral science or humanities courses (or one of each)

Although these are the basic prerequisites, in the current competitive market, many applicants have more upper-level biology courses, and most have included at least one semester of biochemistry. Prerequisite classes must be completed with a grade of C (2.0) or better to be acceptable.

Check out their web site for more interesting FAQs.

<http://www.vet.upenn.edu/EducationandTraining/StudentAdmissions/FAQs/tabid/305/Default.aspx>

5. Request a Committee letter from the HPAC. Schedule an Interview.

GUIDELINES FOR OBTAINING A HPA COMMITTEE LETTER FOR MEDICAL AND DENTAL SCHOOL APPLICATIONS

All medical schools conferring an M. D. (Medical Doctor) and most conferring a D.O. (Doctor of Osteopathic Medicine) currently require a letter of evaluation from the Health Professions Advisory Committee. A Health Professions Advisory Committee (HPAC) letter is expected by medical schools for all applicants from Merrimack College. A committee letter is an option for dental schools, and not a practice for veterinary schools.

To process a committee letter for an application, interviews must take place and materials must be submitted according to the deadlines listed below. A committee letter is a four page summary highlighting the strengths of the applicant. It is based on the individual letters, interview, academic record, personal statement and resume of the applicant. All original letters of recommendation, which must be submitted confidentially directly to the HPA are appended to the committee letter.

Preparation of good committee letters is a **lengthy process** involving careful crafting of the letter by the HPA, editing by the other members of the HPAC, re-writing the letter and final HPAC approval. All this must take place before faculty disperse for the summer. Merrimack College's deadline for submission of these materials is much later than most other college pre-med programs, but it is a strict deadline designed to make your application the most competitive it can be.

If the deadlines for submission of materials are missed, the committee will provide a letter stating that the decision to apply to medical school was made after deadlines for the HPAC had passed, and that the absence of a committee letter in no way reflects a negative endorsement of the applicant.

DEADLINES

- 1. Schedule an interview with the HPAC before April 1.**
 - 2. Submit all of the following materials to the HPA by May 1:**
 - a. List of all recommenders who are sending letters. It is the responsibility of the applicant to see that these letters have been received by the HPA.
 - b. **Confidential** letters of recommendation should be sent directly to HPA. It is the responsibility of the APPLICANT to see that these letters have been sent and
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received by the HPA on time. Letters should include one each from a science professor, a liberal arts professor and an outside reference. Up to five letters can be submitted.

When requesting letters of recommendation, you should ask the potential recommender if they can write you a **good** letter. They should respond with integrity, either yes or no. If they say no, they cannot write a good letter, thank them for their candor and seek out another referee.

Many referees will ask what should be included in a letter. Some links that provide excellent guidelines are included in the last page of this guide.

Letters should be solicited from 1) a science professor 2) a liberal arts professor 3) someone who has observed you in a clinical setting. If you are applying to an osteopathic medical school, you must obtain a letter from a D.O. you have shadowed. Additional letters might come from other employers, supervisors, coaches, etc.

- c. Names and addresses of all schools to which the letters will be sent
 - d. Personal statement
 - e. Resume, including contact information after graduation.
 - f. AACOMAS or AMCAS Application ID#; or the AADSAS Matching form
 - g. AMCAS electronic letter form (or the AADSAS Matching form)
 - h. Merrimack College transcript
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6. Follow all the timelines and deadlines for Merrimack College in this handout!

Sample Medical School Application Timeline

(adapted for Merrimack College from The College of the Holy Cross)

Students wishing to apply to medical (and most health professional) schools must begin the application process more than two years before intended matriculation. That means, if you wish to enter medical school in the fall of 2014, you must have started the process in the fall of 2012.

Medical and dental school applicants must assemble three main credentials: (1) the application form (administered through [AMCAS](#), [AACOMAS](#), or [AADSAS](#)), (2) the MCAT or DAT score, and (3) the health professions committee recommendation (optional for dental schools). **To get full consideration from the largest pool of medical schools, the MCAT and DAT must be taken by early April one calendar year before intended matriculation.** (Most medical schools fill slots on a rolling basis, starting late summer based on applications submitted as early as June 1.) That means, if you wish to enter medical school in the fall of 2014, you must take the MCAT by April 2013. Other health professions follow a similar time line.

Beginning three academic years before proposed date of entering medical school...

ACADEMIC YEAR 1 (Junior Year) : Prepare for and take MCAT

During the year or during the summer, take an MCAT prep course, or embark on your own schedule of preparation.

Summer, take MCAT for the first time.

Proceed to the next level of preparation IF your scores are good enough!

- (The [MCAT](#) is administered via computer at specific testing sites and is offered several times a year.)
- **AFTER GETTING THE MCAT SCORE, students make a decision whether to continue the application process. IF you did not get above a 30, regroup and plan a re-take strategy.**

ACADEMIC YEAR 2 (Senior Year): Prepare for submitting your application

Fall Year 2

- **Early in fall semester two years before intended matriculation date:** Information meeting held to outline the application process. Alumni and those off campus need
-

to contact the HPA* to activate credentials file, obtain materials, and get added to e-mail list.

- **Late fall through mid-spring:** study for MCAT re-take if necessary.

Winter Year 2

- Take [MCAT](#) for second time if necessary. (The [MCAT](#) is administered via computer at specific testing sites and is offered several times a year.)
- **AFTER GETTING THE MCAT SCORE, students make a decision whether to continue the application process. IF you did not get above a 30, regroup and plan a re-take strategy.**
- **Immediately after making the decision to go ahead:** Solicit confidential letters of recommendation to be sent to the HPA. See HPA for guidelines for what to submit to obtain a committee letter. **Make sure to notify your advisor of your application decision so she or he can write your letter**

Spring Year 2

- **Before April 1:** **Schedule an interview with the HPAC before April 1.** Students meet with the HPA to go over necessary materials for the committee letter.
- **May:** As soon Complete application materials for on-line application (through [AMCAS](#) for MD schools; the [AACOMAS](#) application for DO schools may not be ready until late June).
- **May 1st:** All letters of reference, the personal statement, transcript and resume must be delivered to HPA. HPAC letters are take considerable time to prepare ad must be completed before faculty are contractually finished for the 10 month academic year on July 1.

Those applicants who are not interviewed or do not get their documents into the HPA by May 1 will forego having a committee letter written for the current cycle. If the individual still intends to apply, he/she will have to submit individual letters. Because this is not viewed well by admissions committees, a letter of explanation will be provided. See appendix.

Please note that applying late in the cycle sends the wrong message to a medical school acceptance committee. It shows you lack the necessary executive functioning skills necessary to succeed in the rigorous academic environment. Achieving acceptance is difficult enough without jeopardizing your application by applying late in the cycle.

- **Early June:** Send in application as close to the June opening of the application portal as possible. Apply as early as possible; most schools have "rolling admissions" which means they start considering (and accepting) applicants as applications are submitted. (Note: DO applications usually open July 1.)

* HPA – Health Professions Advisor, HPAC – Health Professions Advisory Committee

- **Early June:** Bring addressed envelopes with separate stamp to HPA so recommendation letters can be mailed out only for schools not subscribing to the AAMCAS letter service (or follow other directions given by the HPA).

Summer Year 2

- **July - August:** Receive and complete secondary application materials from schools.
- **Mid-Late summer:** AMCAS letter service distributes HPAC letters to medical schools who have requested them. For those schools not subscribing to the AMCAS letter service, the HPA mails committee letters to medical schools on a rolling basis, after students notify the HPA that they have received requests for secondary applications

ACADEMIC YEAR 3

First Alumni: Fall Year 3

- **Early fall:** interview at medical schools;

Spring Year 3

- hear results; accept one school. If you are certain you will not go to a school in which you are accepted, let school know so your place can go to another student.

ACADEMIC YEAR 4

Second Alumni: Fall Year 3

Enter medical school in August!

PLEASE NOTE: Many students follow the national trend and wait a year or more after graduation before applying to professional school. Merrimack College is committed to supporting its graduates and will provide support (committee letters, services of the HPA) following graduation.

7. SOME VERY HELPFUL LINKS

The Merrimack College HPA is a member of the North East Advisors to the Health Professions (NEAAHP), and the National Association of the Advisors to the Health Professions (NAAHP)

The NEAHAP web site is chock full of links to professional societies of all kind of health fields. Below are the most appropriate links for pre-med, dent and vet students:

<http://www.neaahp.org/links.html>

<i>Allied Health</i>	<i>Health, Communication</i>	<i>Public Health</i>
<i>Allopathic Medicine</i>	<i>& Administration</i>	<i>Science and Engineering</i>
<i>Alternative Medicine</i>	<i>Mental and Social Health</i>	<i>Sports Medicine</i>
<i>Chiropractic Medicine</i>	<i>Nursing</i>	<i>Technical Instrumentation</i>
<i>Clinical Laboratory</i>	<i>Nutrition and Dietetics</i>	<i>Therapy and</i>
<i>Services</i>	<i>Optometry</i>	<i>Rehabilitation</i>
<i>Counseling</i>	<i>Osteopathic Medicine</i>	<i>Veterinary Medicine</i>
<i>Creative Arts Therapy</i>	<i>Pharmacy</i>	<i>Vision Care</i>
<i>Dental</i>	<i>Physician Assistant</i>	
<i>Genetics</i>	<i>Podiatry</i>	

...and testing agency home page for the DAT, GRE, MCAT OAT and PCAT:

<http://www.neaahp.org/testinformation.html>

Pre-med organization of the American Medical School Association:

<http://www.amsa.org/AMSA/Homepage.aspx>

Study Skills Management

<http://www.ucc.vt.edu/stdysk/stdyhlp.html>

Letters of reference guides to forward to your recommenders

http://www.naahp.org/resources_writingrec.htm

<http://www.accepted.com/medical/LettersRec.aspx>

<http://www.ivyleagueadmission.com/medreftips.html>

Guides for writing personal statements

<http://www.princetonreview.com/medical/personal-statement.aspx>

<http://www.studentdoctor.net/2007/06/before-you-write-your-personal-statement-read-this/>

<http://www.cmu.edu/hpp/achieve/pstips.html>

Merrimack College HPA: Janine.LeBlancStraceski@merrimack.edu
