MEDICAL DIRECTION
GUIDEBOOK
“Wherever the art of Medicine is loved, there is a love of Humanity.”

- Hippocrates
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Introduction

Medical Direction (MD) was launched by the Science Undergraduate Society (SUS) in 2008. On the most basic level, Medical Direction strives to provide students interested in the medical profession with relevant information so that they can make an informed and educated decision about their future. Medical Direction will be providing information sessions, podcasts, opportunities to shadow doctors, and chances to participate in medical humanitarian trips, as well as sources for volunteering in the community. It is our hope that, through Medical Direction, you will be able to gain a deeper and broader understanding of the medical field so that you can decide if this is the path for you.

The road to medical school is not an easy one. You must excel in your academics as well as develop interpersonal skills that are foundational to the quintessential physician in modern medicine. In addition, the competition is fierce, with some of the brightest, young minds all vying for admission. McGill is a research-intensive university with many services aimed towards helping students become successful in whatever field they pursue. In addition, McGill harbors a vibrant community with a plethora of opportunities for everyone to get involved and make the most of their education.

This book provides information regarding the medical profession in a detailed, yet concise, manner. It was researched, written, and edited by undergraduate students. In this book, you will find details regarding entrance requirements, the MCAT 2015, Canadian medical schools, international medical schools, and so much more. We have taken great care to ensure that this book is accurate and up to date. However, we do recommend that you still take the time to consult each medical school’s website to confirm important details: your future is first and foremost determined by you!

By reading this guide, you are already taking the first steps towards a bright future.

Sincerely,

Leo Shen
Medical Direction
VP Academics 2016-2017
Getting into Medical School

a. Entrance Requirements

i. Degree and Course Requirements

Each of the 17 medical programs in Canada has its own specific set of requirements for prospective students. Many Canadian programs will admit students after they have completed three years of post-secondary education, though some schools require the completion of a full bachelor’s degree. Most medical schools accept students from all majors, but most have a list of prerequisites. The prerequisites, MCAT scores, and admission requirements may differ depending on the student’s citizenship also; therefore, students are encouraged to explore the specific medical school of choice’s website to determine personal eligibility.

Below are two tables that summarize the basic degree and course requirements of Canadian medical schools. Table 1 displays the number of years of full-time undergraduate study needed in order to be considered eligible for admission. The definition of a full-time student varies from school to school; usually a full course-load during the fall and winter semesters is required. Also note that in Table 2, credit requirements reflect McGill credit equivalents. “L” denotes a lab component is required; “R” denotes that a course is recommended, but not required by the university. Universities not shown in Table 2 do not have course requirements as of the date this guidebook was compiled (although Laval, Sherbrooke, and l’Université de Montréal have requirements at the CÉGEP level). For a more in depth look, McGill students can consult the SUS RedBooks website at redbooks.sus.mcgill.ca (see Resources for McGill Students). For the most accurate, detailed and up-to-date information, students should consult the websites of individual medical programs or contact the programs’ Admissions Officers.

<table>
<thead>
<tr>
<th>Years of Undergraduate Study Required</th>
<th>Duration of Medical Program</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 years</td>
</tr>
<tr>
<td>2</td>
<td>University of Calgary</td>
</tr>
<tr>
<td>3</td>
<td>McMaster University</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed 4-year Bachelor’s degree</td>
<td>University of Saskatchewan</td>
</tr>
<tr>
<td></td>
<td>University of Manitoba</td>
</tr>
<tr>
<td></td>
<td>Northern Ontario School of Medicine (NOSM)</td>
</tr>
<tr>
<td></td>
<td>University of Western Ontario</td>
</tr>
<tr>
<td>DEC or equivalent</td>
<td>L’Université de Montréal</td>
</tr>
<tr>
<td></td>
<td>L’Université de Sherbrooke</td>
</tr>
<tr>
<td></td>
<td>L’Université de Laval</td>
</tr>
</tbody>
</table>
Table 2: Required Courses for Canadian Medical Schools

<table>
<thead>
<tr>
<th>Life Sciences</th>
<th>General Biology</th>
<th>Physiology</th>
<th>Biochemistry</th>
<th>General Chemistry</th>
<th>Organic Chemistry</th>
<th>Physics</th>
<th>General Statistics</th>
<th>Calculus</th>
<th>Social Sci. and Humanities</th>
<th>Languages</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>UBC</td>
<td>6R</td>
<td>6R</td>
<td>6R</td>
<td>6R</td>
<td>6R</td>
<td>3R</td>
<td>3R</td>
<td>6R</td>
<td>6R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Calgary</td>
<td>6R</td>
<td>6R</td>
<td>6R</td>
<td>6R</td>
<td>6R</td>
<td>3R</td>
<td>3R</td>
<td>3R</td>
<td>3R</td>
<td>6R</td>
<td>R</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>Manitoba</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18(^1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOSM</td>
<td>6R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toronto</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3R</td>
<td></td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ottawa</td>
<td>6L</td>
<td>12L</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McGill</td>
<td>R</td>
<td>6L</td>
<td>R</td>
<td>6L</td>
<td>6L</td>
<td>6L</td>
<td>R</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Memorial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

L: Lab component required  
R: Recommended but not required  
\(^1\)Applicants who complete a 4 year Major or Honours Program may waive up to 12 credits of this pre-requisite

### iii. GPA

GPA is king. Your GPA will play a large role in determining your chances for admission into the medical school of your choice. Although your MCAT score, extra-curriculars, and letters of recommendation will all play a role in the admissions process, your GPA will normally have the largest impact. The exact weight of an applicant’s GPA in determining whether or not an interview/admission is offered will vary from school to school.

Each year, most universities determine a cut-off score; if an applicant’s GPA falls below the cut-off, the application is not considered any further. These cut-offs vary from year to year, depending on the pool of applicants. However, it is important to keep in mind that the GPA cut-off is not the average GPA for admitted students – if you just make the GPA cut-off, it is important to supplement your application with a strong MCAT score or terrific recommendations and extra-curriculars.

Methods of calculating the GPA vary from school to school. Some schools consider all university-level courses, while others consider only those taken during the last few years, or two best years of study. Other schools weigh grades according to the year in which the course was taken. Each school has its own policy when it comes to repeated courses. Applicants should note that the definition of “full-time student” may also vary depending on the school.

Many Canadian medical schools give preference to in-province or regional applicants. This preference may take the form of more lenient cut-off scores or placing quotas on the number of out-of-province students...
accepted. Regardless, an out-of-province student should be prepared for fiercer competition than an in-province applicant.

The following table summarizes GPA requirements and calculation methods for Canadian medical schools. Please note that these statistics were compiled based on the information available at the time; this may or may not refer to the most recent entering class. Students should refer to the website of each medical school or contact an admissions officer for more complete information. Note that in Table 3, “IP” refers to In-Province applicants, while “OOP” refers to Out-of-Province applicants (unless otherwise noted). If separate GPAs are not listed, this does not necessarily mean that the cut-offs/averages are the same. “Average” GPA refers to the mean/median GPA of the entering class or admitted students, depending on which information was available. All GPAs are expressed in terms of a 4.0 scale.

<table>
<thead>
<tr>
<th>School</th>
<th>Minimum GPA</th>
<th>Calculation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IP (min/av)</td>
<td>OOP (min)</td>
</tr>
<tr>
<td>UBC</td>
<td>3.30*/3.80</td>
<td>Two GPAs are calculated: Overall Academic Average, and Adjusted Academic Average in which the lowest year containing at most 30 credits may be dropped as long as 90 credits remain for calculation by June 1 of the application year</td>
</tr>
<tr>
<td>Alberta</td>
<td>3.30/3.90</td>
<td>All courses taken as a full-time student are considered; if only completing two or three years of undergraduate study, minimum GPA is 3.70; if the applicant has more than four years of full-time study, the lowest academic year may be dropped</td>
</tr>
<tr>
<td>Calgary</td>
<td>3.20/-</td>
<td>Applicants who have more than two years of full-time study and who have graduated or will be graduating in the current academic year will have their lowest academic year dropped</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>3.30/-</td>
<td>Courses taken as a full-time student during the first two-years of study are considered; courses from subsequent years of study can also be considered if they are leading to a degree</td>
</tr>
<tr>
<td>Manitoba</td>
<td>3.30/&gt;3.80</td>
<td>All courses are eligible to be considered, though a certain number of credits will be dropped from calculation based on # of credits completed</td>
</tr>
<tr>
<td>NOSM</td>
<td>3.00/3.83</td>
<td>All undergraduate courses considered, including failed courses and summer courses</td>
</tr>
<tr>
<td>Schulich</td>
<td>3.70</td>
<td>GPA is calculated based on courses taken during years of full-course load (30 credits); minimum GPA must be met in at least two of these years (see website for other requirements)</td>
</tr>
<tr>
<td>McMaster</td>
<td>3.0/3.75</td>
<td>All courses are considered (excepting those graded P/F)</td>
</tr>
<tr>
<td>Toronto</td>
<td>3.60/3.96</td>
<td>The lowest grade for an equivalent of one full-year course is eliminated per year of study. Summer courses are not included (but may count as prerequisites)</td>
</tr>
<tr>
<td>Queen’s</td>
<td>varies by year</td>
<td>Two GPAs are calculated: the cumulative GPA and the most recent two full-time years GPA (2YGPA)</td>
</tr>
<tr>
<td>Ottawa</td>
<td>3.50/-</td>
<td>Courses are weighted according to length of study (see website for details); summer courses are not included</td>
</tr>
<tr>
<td>McGill</td>
<td>3.40*/3.83</td>
<td>All courses are considered (CGPA); note that applicant should have an average of 15 credits per semester</td>
</tr>
<tr>
<td>Dalhousie*</td>
<td>3.30/3.90</td>
<td>GPA is based on last two consecutive years of full-time study</td>
</tr>
<tr>
<td>Memorial</td>
<td>3.70</td>
<td>All courses are considered</td>
</tr>
</tbody>
</table>

1In-province students with <3.3 (75%) will not receive a full-file review
2Out-of-province students with <3.7 (85%) will not receive a full-file review
3No GPA cut-off but GPA below 3.40 is rarely considered competitive
4For Dalhousie, “In-province” = residents of New Brunswick, Nova Scotia and PEI
iii. The MCAT 2015

The majority of Canadian medical schools require that applicants write the Medical College Admission Test, or MCAT, administered by the Association of American Medical Colleges (AAMC).

Approximately five hours in length, this test will examine your critical thinking, writing and problem solving skills. In combination with your GPA, the MCAT is a key marker of your academic aptitude. Like your GPA, the weight of your MCAT score in admission decisions varies from school to school.

Table 4 below outlines the structure of the MCAT 2015 which was introduced in January 2015. Most Canadian medical schools are still accepting scores from the old MCAT, but students are urged to check the respective websites to confirm the validity of their MCAT score.

### Table 4: MCAT 2015 Structure

<table>
<thead>
<tr>
<th>Section</th>
<th>#Q</th>
<th>Time (min)</th>
<th>Grading</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological and Biochemical Foundations of Living Systems</td>
<td>59</td>
<td>95</td>
<td>118-132</td>
<td>Tests concepts in introductory-level biology, organic and inorganic chemistry, as well as topics in cellular and molecular biology. Also tests for demonstration of scientific inquiry and understanding of research methods.</td>
</tr>
<tr>
<td>Chemical and Physical Foundations of Biological Systems</td>
<td>59</td>
<td>95</td>
<td>118-132</td>
<td>Tests concepts in introductory-level biochemistry and physics but also touches upon topics in organic and inorganic chemistry, as well as biology. Also requires demonstration of scientific inquiry and understanding of research methods.</td>
</tr>
<tr>
<td>Psychological, Social, and Biological Foundations of Behaviour</td>
<td>59</td>
<td>95</td>
<td>118-132</td>
<td>Tests your knowledge in psychology, sociology, and biology related to mental processes and behaviour. Also requires demonstration of scientific inquiry and understanding of research methods.</td>
</tr>
<tr>
<td>Critical Analysis and Reasoning Skills (CARS)</td>
<td>53</td>
<td>90</td>
<td>118-132</td>
<td>Tests for comprehension, analysis and reasoning skills. Includes content, of which prior knowledge is not required, in ethics, philosophy, cultural studies, population health, social sciences and humanities.</td>
</tr>
</tbody>
</table>

The maximum possible score on the MCAT 2015 is 528. Every section consists primarily of passage-based questions (the CARS section will be passage based only). Each section has approximately nine to ten passages with roughly four to seven associated questions. All sections other than CARS also have a number of free-standing questions that are not based on any passage. Each of these four sections is graded on a scale of 118-132. Your score is based on how many questions you answered correctly relative to all other individuals writing that same version of the test. The projected mean by AAMC is 125, which is equivalent to a score of 8 on the old MCAT. There are several conversions online for scores from the MCAT 2015 to the old MCAT; but students are advised to take such information with a grain of salt since the two tests are very different beasts. When comparing scores, percentile ranks should offer a more accurate representation.

**Schedule:**
The MCAT 2015 can be written a maximum of seven times in a lifetime, at a maximum of three times per year or four times in two consecutive years, as per the AAMC. However, the cost of signing up for each MCAT is non-trivial, thus students are advised to make the most of their MCAT sitting and to be well-
prepared. Most “pre-med” students at McGill take the MCAT the summer after U1. This offers several advantages:

1. By this point, the typical science student will have completed all courses whose material will appear on the MCAT (e.g. CHEM 110/120, PHYS 101/102, CHEM 212/222, BIOL 112, BIOC 212)\(^1\)
2. The material from the courses previously listed will most likely still be fresh in your minds
3. It will be the summer, so you won’t have classes to worry about!
4. If you don’t do as well as you’d like to, you will be able to rewrite the MCAT in the following summer and still have time to get your scores in before applying to medical school

\(^1\) In addition to the regular courses listed, BIOL 200, BIOL 202, BIOC 212, PHGY 209/210, and psychology/sociology classes are highly recommended in order to ensure exposure to all the material that will appear on the MCAT 2015

Different schools have different deadlines for submission of MCAT scores, but in general most schools require that MCAT scores be ready and received by the application deadline. The deadline for most Canadians schools is mid-October; for certain American schools, the deadline is earlier. Some American schools also practice rolling admissions (where admissions are doled out on a first-come first-serve basis depending on the eligibility of the candidate). Therefore, it is highly recommended that students plan to write the MCAT no later than the end of August or at latest, the beginning of September, during the application cycle year (depending on which schools you are applying to). Students looking to compete for spots in American medical programs should submit their entire application, including MCAT scores, as early as possible in the cycle; thus, students may want to be sure they will have received their MCAT scores by then.

Scores are received roughly one month after the test date and most medical schools will have the latest MCAT test date, for which the score will be valid for that current application cycle, displayed on their website. It is also important to be aware of how long MCAT scores are valid for. Most schools will accept scores no more than three years old, though some will accept scores as many as five years old. It is highly recommended that students check the individual school websites, to ensure that their MCAT scores will be considered valid for their application year of interest.

Registration is done through the AAMC website, [http://www.aamc.org/students/mcat/](http://www.aamc.org/students/mcat/).

The MCAT can be written in many different locations, with a multitude of test dates available across Canada and the United States. Registration typically opens about 5 months before the test date and closes about two weeks before the test date. However, each test centre has a limited capacity, so be sure to register early if there is a particular date you have in mind. Seats tend to fill up very quickly once registration opens.

**Scores:**
As with your GPA, many medical schools have minimum MCAT scores that must be met in order for an application to be reviewed. These are usually lower than the average MCAT scores of accepted applicants. The most recent score cut-offs are listed in Table 5 below.

Certain Canadian Medical schools (namely Northern Ontario and Ottawa) do not require that applicants write the MCAT. McGill does not require the MCAT from applicants who attended or are attending Canadian universities in pursuit of their degree; however, these applicants may submit MCAT scores if they feel that the score will strengthen their application.

The following table summarizes the minimum required MCAT scores by school. Note that the total MCAT score is not always the sum of individual sections. For example, the University of Saskatchewan has
minimum cut-offs for each section, but also requires a total score of at least 506, which means that getting 126s across the board won’t cut it.

Schools across Canada also have different methods of evaluating MCAT scores for those who have taken the test more than once. Some only look at the most recent sitting while others may formulate a composite score. Students are encouraged to check the websites or call the admissions department for more detailed information.

<table>
<thead>
<tr>
<th>University</th>
<th>Minimum MCAT Scores</th>
<th>Average MCAT Scores (prior to MCAT 2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bio/Bioc</td>
<td>Chem/Phys</td>
</tr>
<tr>
<td>UBC</td>
<td>124</td>
<td>124</td>
</tr>
<tr>
<td>Alberta</td>
<td>124</td>
<td>124</td>
</tr>
<tr>
<td>Calgary</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>-/127</td>
<td>-/126</td>
</tr>
<tr>
<td>Manitoba</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Schulich</td>
<td>124/127</td>
<td>125/127</td>
</tr>
<tr>
<td>McMaster</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Toronto</td>
<td>125</td>
<td>125</td>
</tr>
<tr>
<td>Queen’s</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ottawa</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>McGill</td>
<td>124/125</td>
<td>124/125</td>
</tr>
<tr>
<td>Dalhousie</td>
<td>124/125</td>
<td>124/125</td>
</tr>
<tr>
<td>Memorial U.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

1 Minimum of 7 in every category for MCAT taken from 2012-2014
2 In-province/Out-of-province
3 MCAT cut-off fluctuates yearly
4 Applicants from Quebec Universities and Out-of-Province applicants from Canadian Universities are not required to write the MCAT
5 In-province applicant may have one score of 124, and minimum total score of 499. Out-of-province applicant may have one 125 but total must add up to at least 503; any section of 124 or less is not eligible for application
6 Old MCAT scores will no longer be accepted starting from the 2015-2016 application cycle and beyond

Preparing:
Doing well on the MCAT requires a lot of time and energy, and every effort should be made to do well the first time around. Though it is by no means required, many students choose to take a preparation course before writing the MCAT. However, do note that prep courses may not be congruent with the learning style of each individual student. Those who have effective self-study habits can purchase study materials that will ultimately save them a lot of money. The Science Undergraduate Society has agreements with Kaplan Test Prep, Prep 101 and The Princeton Review that give McGill science students discounts on their prep courses. Recently, Medical Direction interviewed representatives from each of these three companies. [Representatives: Kaplan – Gabe Mott (Faculty Manager and Instructor); Prep 101 – Glen Tiwana (Director) and Sawsan Elkhaldi; Princeton Review – Armen Forget (Instructor).] To listen to the full interviews and to find out more about what each program has to offer, check out MedCasts at md.sus.mcgill.ca/medcasts/.

Table 6 on the next page describes the standard classroom prep course offered by each company; other options such as private tutoring and online courses may also be available. The SUS and Medical Direction do not wish to endorse any particular MCAT prep course; students interested in taking an MCAT prep course should do their own research to find the course that is right for them.
For the new MCAT 2015, we have limited information on whether prep courses are up to date in preparing students for the new MCAT material; however, it is highly recommended that you try out trial classes and/or consult their campus representatives as well as websites for more information before making your decision.

For those looking to pursue the self-study route, there are many resources available online that include study schedules, materials, and tips and tricks written and recommended by others who have previously taken the exam. Students are encouraged to explore their options so as to make informed decisions regarding their preparation leading up to this crucial test.

Table 6: Summary of Some Popular MCAT Prep Courses in Montreal

<table>
<thead>
<tr>
<th>Hours of instruction (in-class)</th>
<th>Kaplan Test Prep</th>
<th>Prep101</th>
<th>The Princeton Review (TPR)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teaching style</strong></td>
<td>“Classes are spent… with a special focus on building critical thinking skills and confidence through realistic practice. Advanced courses are available for in-depth review of the most difficult MCAT topics.”</td>
<td>“50/50 material and strategy”</td>
<td>“A mix of topic review, strategy overview and in-class hands-on practice”</td>
</tr>
</tbody>
</table>
| **Summary of resources provided** | - Comprehensive full-colour Review Notes  
- Lessons-on-Demand and Explanations-on-Demand (500+ hours)  
- Flashcards and QuickSheets  
- Subject, Section, and Topic-specific workshops, quizzes, and tests  
- Customizable MCAT QBank quiz application  
- Adaptive learning technology for performance analysis  
- 12 full-length practice MCATs  
- 11,000+ practice items, all available in realistic computer-based format | - *Examkrackers®* study guides  
- 31 In-Class exams and workshops  
- Online lectures  
- Practise questions with full solutions  
- 4-6 practice MCATs | - Extensive study guides  
- Practise problem workbooks  
- Subject-specific drills  
- 12 full-length practise MCATs  
- Money back guarantee |
| **Price**                     | $2299            | $1895   | $2299                     |
| **What makes this program stand out?** | “The core of our program is the personalized learning experience; with a wide-spectrum of course options and resources to choose from, we provide the tools to help each student get the customized prep he or she needs. With the Kaplan program, you will score higher on the MCAT – guaranteed or your money back.” | “I think our biggest asset is our teachers…the way we hire them, the training, the support they receive. The second aspect that I believe is very powerful is our teaching method, where we combine teaching material and making sure that students know how to apply it on the exam…” | “The Princeton Review offers the longest and most comprehensive course on the market…The Princeton Review offers over 4300 pages of course material…and a team of specialized instructors who receive the best training in the industry.” |

*Prices vary depending on course package
**Recommended Courses**

Obviously, there are no “required courses” for taking the MCAT. However, McGill students should heavily consider taking the following courses (or their equivalents) before writing the MCAT in order to minimize the amount of fresh material that must be processed and digested, leading up to the exam. That being said, it is still possible to do extremely well on the MCAT without taking these courses, but it may require a little bit more work.

For the Chemical and Physical Foundations of Biological Systems section…
- CHEM 110/120: General Chemistry 1&2
- PHYS 101/131: Intro Physics (Mechanics)
- PHYS 102/141: Intro Physics (Electromagnetism)
- BIOC 212 or BIOL 201: Introductory Biochemistry or Cell Biology and Metabolism
- BIOL 200: Molecular Biology

For the Biological and Biochemical Foundations of Living Systems section…
- BIOL 112: Cell and Molecular Biology
- CHEM 212/222: Organic Chemistry 1&2
- CHEM 110/120: General Chemistry 1&2
- BIOC 212 or BIOL 201: Introductory Biochemistry or Cell Biology and Metabolism
- BIOL 200: Molecular Biology

For the Psychological, Social, and Biological Foundations of Behaviour section…
- PSYC 100: Introduction to Psychology
- PSYC 211: Introduction to Behavioural Neuroscience
- SOCI 309: Health and Illness

In addition to these key courses, there are a number of U1 courses that students may find useful…
- BIOL 202: Basic Genetics
- PHGY 209/210: Mammalian Physiology 1&2

**Other Resources:** Medical Direction and the SUS Academic Portfolio, in conjunction with Kaplan, Prep101 and TPR, offer MCAT information sessions and mock MCATs throughout the school year. Keep an eye on the SUS listserv to see find out about upcoming events.

Kaplan, Prep101 and TPR provide information about the MCAT on their websites. Check them out at:

Khan Academy provides a series of free videos and practice questions that you may find useful, especially for preparing for the new Psychology, Social, and Biological Foundations of Behaviour section. You may visit their website at [https://www.khanacademy.org/test-prep/mcat](https://www.khanacademy.org/test-prep/mcat)

Finally, be sure to visit the AAMC website at [http://www.aamc.org/students/mcat](http://www.aamc.org/students/mcat) for all official MCAT information and resources.

The MCAT may be a daunting prospect for students; however, with the proper mindset, study materials, and preparation, the MCAT is a beast that can be tackled and beaten!
b. Building Up Your CV

“In addition to your GPA and MCAT scores, your application to medical school includes your community involvement and extra-curricular interests. An admissions board is looking for people who are committed to helping others, since a good physician must be thoughtful, humble, and passionate. Extra-curricular involvement is a great way to demonstrate to medical schools your capacity and potential to be a successful, future physician, and it can also help you develop a wide variety of skills and experiences that cannot be obtained from academic lecture halls alone.

There is no specific set of recommended activities that you must do in order to be a competitive candidate. Medical school admissions boards recognize that not every applicant has the same opportunities; therefore, an applicant who has not had volunteering experience because he or she had to work will not be at a disadvantage. The key is to demonstrate that the activities you do take part in are meaningful and beneficial to you.

The following table summarizes how some Canadian medical schools evaluate your extra-curricular involvement. While this table does not provide an exhaustive look at Canadian schools, it does offer insight into what admissions committees are looking for.

<table>
<thead>
<tr>
<th>Medical School</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>UBC</td>
<td>Activities and achievements are reported and evaluated using the following categories: leadership; service ethic; capacity to work with others; diversity of experience; high performance in an area of human endeavour. Each category is assessed with a variety of factors considered, and then issued a score (a high score demonstrates significant levels of responsibilities, initiative, and commitment). Evaluators also look for significant involvement and interaction with people from various backgrounds and abilities (outside your normal peer group).</td>
</tr>
<tr>
<td>University of Toronto</td>
<td>Requires an autobiographical sketch and an essay. The autobiographical sketch is a list of activities from the age of 16 to the date of the application deadline. This helps evaluators understand the interests of the applicant and how each applicant spends time outside of his or her academic life. The categories of the activities are: employment, volunteer activities, extracurricular activities, awards and accomplishments, research and other. In the essay, applicants discuss their motivation and preparation, both academically and non-academically, for the study of medicine.</td>
</tr>
<tr>
<td>Queen’s University</td>
<td>Invited candidates are assessed to determine if their personalities and experiences meet certain criteria. This assessment is made based on life experiences, both in the written form and during an interview. No one set of activities is more appropriate than another.</td>
</tr>
<tr>
<td>McGill</td>
<td>The initial assessment of personal qualities and achievements is made from a study of the complete dossier submitted by all candidates. The dossier should give the committee a clear image of the applicant and the personal characteristics and experiences which make him or her particularly suitable for the study and practice of medicine. Included in the evaluation are the applicant’s commitment to service and commitment to helping others. Assessment of the autobiographical sketch, curriculum vitae, and the reports from the referees chosen by the student form the basis for a decision of whether an applicant possessing the academic performance criteria is to be invited for an interview.</td>
</tr>
</tbody>
</table>

As you can see, although every medical school emphasizes different aspects of the application, they are all looking for the same core values: passionate students with academic drive, compassion, diverse backgrounds, the ability to think critically, and leadership skills.
**Getting Involved**

At McGill, we are lucky to have many opportunities to get involved in clubs, committees, teams, councils, and student societies. A list of clubs and services is on the Students’ Society of McGill University (SSMU) website ([http://ssmu.mcgill.ca/clubs-services/](http://ssmu.mcgill.ca/clubs-services/)). SSMU also puts on an activities night once a semester where students can learn about and sign up for these clubs and services. Medical Direction also has a lot of opportunities for students, ranging from shadowing doctors, to participating in trips with GMT (Global Medical Training) to developing communities where you will interact with local patients and enrich your medical experience. For more information about how you can get involved with MD, visit [http://md.sus.mcgill.ca/](http://md.sus.mcgill.ca/). Be sure to keep an eye on SUS listservs, as well. These are your number-one resource for up-to-date information about how to get involved.

Clinical experience is another great way to help others; even better, it can allow you to get a true feel for the medical career. Clinical experience can include volunteering or working in a hospital, clinic, or nursing home. There are many ways to go about obtaining clinical experience. Hospitals in the Montreal area are often looking for volunteers. Recruiting sessions are held every spring and fall, with a personal interview as a part of the application process. Volunteers are expected to commit at least three consecutive hours per week for about 4-6 months (this time commitment varies among hospitals). There are a variety of positions available, and it is best to contact the hospital you are most interested in to see what they have to offer. The McGill University Health Centre ([http://www.muhc.ca/](http://www.muhc.ca/)) can direct you to information on many of the hospitals close to campus.

Research is another experience valued by admissions committees. Not only does it give you laboratory experience, it exposes you to an alternative career path. Participating in research will teach you a variety of skills and techniques, and may inspire you to pursue a joint MD/MA or MD/PhD program.

One of the simplest and most direct ways to get involved with research is by talking to your professors. Read up on their research to figure out whose work interests you most. It is also helpful to talk to students who have previously worked in their labs: research methods differ, and while the subject matter may interest you, the methodology might not. Once you have done your homework, you can visit professors during their office hours or you can set up appointments. Be sure to bring a copy of your CV and unofficial transcript. Be polite when expressing your desire to work with them, and be gracious if turned down. They may know of colleagues who are accepting student researchers, so be sure to ask if they can direct you to someone else. It can also be helpful to talk to TAs and departmental staff – they may know which individuals tend to hire undergraduates.

The website for the Office of Undergraduate Research has a database of professors who tend to hire students. Note that the database is not a job listing, however; there is no guarantee that the included professors are hiring. You can check out the database at [www.mcgill.ca/caps.com](http://www.mcgill.ca/caps.com).

McGill offers several research based and field study courses. ‘396’ courses are three-credit research electives that can be taken within or outside your department. Honour programs generally have a research component that is completed during U3. There are also several summer research awards available for undergraduate students at both the national and provincial level.

**Did you know?**

At the beginning of each semester, the Faculty of Science hosts “Soup and Science” – a week-long event where professors have three minutes to present their current research. Afterwards, students have a chance to mingle with professors over free lunch. It’s a great way to find out about what’s going on in each department and network with professors. You can also check out the Undergraduate Research Conference held each October, which features work done by current undergraduate researchers.
For more information on undergraduate research, you can go by the Office for Undergraduate Research or check out their website at http://www.mcgill.ca/science/ours/.

Medical Direction
Our club has great resources to help you jump start getting those extra-curricular points. We have a shadowing program where you can apply to observe physicians or other clinical professionals’ work. You may send in your application all year round, and we take your preferences into consideration for matching. In addition, we offer a volunteer program where we advise and help you in getting suitable clinical or other volunteering positions during your study period. For more information, visit our website at http://md.sus.mcgill.ca/.

c. Application Process

Applying to medical school is no easy task. It can be tough to keep track of deadlines, to submit required supporting documents and to write compelling personal essays and autobiographical statements. It will take you a lot of time, hard work and organization to craft a successful application. The key to triumph is starting early: read on to get ahead of the curve.

i. Types of Programs

Students usually have questions about the different medical degrees offered by various schools. Programs vary greatly from school to school, and equivalent degrees can go by different names.

The MD, or Doctor of Medicine (MD from the Latin, Medicinae Doctor) is a professional degree offered in various countries like the United States and Canada. This is equivalent to a Bachelor of Medicine or Bachelor of Surgery (MBBS or MBChB) offered by schools in Great Britain and other Commonwealth countries. At McGill, the same degree is called an MDCM (from the Latin, Medicinae Doctor et Chirurgiae Magister, or Doctor of Medicine and Master of Surgery). The MD is the main degree pursued by future doctors.

In many Canadian and American medical schools, it is possible to graduate with a joint degree. Depending on the university, one can obtain a PhD, an MBA or even a law degree in addition to the MD. Here are examples of some common joint medical degrees:
Table 9: Joint Programs Offered by Some Medical Schools

<table>
<thead>
<tr>
<th>Program</th>
<th>Duration (Years)</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>MD/MBA</em> (joint medical and management degree)</td>
<td>5 (first year, management; last four years, medicine)</td>
<td>In most cases, there are additional application requirements for this program. For example, for McGill Medical School, an applicant must submit supporting documentation including a personal statement describing their interest in the program and career aspirations, as well as additional referee evaluations attesting to their scholastic aptitude and program potential.</td>
</tr>
<tr>
<td><em>MD/PhD</em> (joint medical and Doctor of Philosophy degree)</td>
<td>7 (typically: first 2 years, medicine; last 5 years, combined graduate and medical studies)</td>
<td>This program provides a chance for students to do research while in medical school. As with the MD/MBA, there are some additional application requirements.</td>
</tr>
<tr>
<td><em>MD/JD</em> (joint medical and law degree)</td>
<td>6 to 7 (first two years, medicine; third and fourth years, law; final years, combined medical and legal studies)</td>
<td>Many schools require the LSAT to apply to this program.</td>
</tr>
<tr>
<td><em>MD/MPH</em> (joint medical and Master of Public Health degree)</td>
<td>5 (typically)</td>
<td>If you feel that medical education focuses too much on the individual patient and ignores the global picture like world health issues, this program may be for you. Many American Universities offer this program.</td>
</tr>
</tbody>
</table>

Many universities have programs unique to their Faculty of Medicine. If you are interested in pursuing more than your basic MD, be sure to check out all the possibilities.

*i. How and When to Apply*

For most medical programs in Canada, applications are submitted directly to each medical school. For Ontario medical schools, applications go through the Ontario Medical School Application Service (OMSAS). Certain Ontario schools require that additional components of the application be submitted directly to each medical school.

Details concerning application requirements and deadlines vary greatly. Please consult McGill RedBooks at [www.redbooks.sus.mcgill.ca](http://www.redbooks.sus.mcgill.ca) for current information about each school’s policies, as well as the schools’ individual websites for more specific and up-to-date information.

The following tables summarize key deadlines and information for each Canadian medical school (non-Ontario and Ontario), as well as when to expect to hear back regarding an offer of admission. Keep in mind that applications are not inexpensive so make sure you are aware what goes into each application.
Table 10: Deadline Information for Non-Ontario Canadian Medical Programs

<table>
<thead>
<tr>
<th>University</th>
<th>App. Open</th>
<th>Application Fees</th>
<th>App. Due (with supporting documents)</th>
<th>MCAT Scores Due</th>
<th>Interview Dates</th>
<th>Offers of Admission</th>
</tr>
</thead>
<tbody>
<tr>
<td>UBC</td>
<td>June</td>
<td>$168/224&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Sept 15, 2016 (transcripts, legal documents if applicable)</td>
<td>Oct 1, 2016</td>
<td>Dec Feb</td>
<td>May, 2017</td>
</tr>
<tr>
<td>Alberta</td>
<td>June</td>
<td>$130 / $180&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Oct 1, 2016 (2 hardcopies of Official Transcript, 2 reference letters)</td>
<td>Oct 1, 2016</td>
<td>- Mar</td>
<td>May 15, 2017</td>
</tr>
<tr>
<td>Calgary</td>
<td>July</td>
<td>$150</td>
<td>Oct 1, 2016 (references, transcript)</td>
<td>Oct 1, 2016</td>
<td>Early Feb Feb</td>
<td>Early May, 2017</td>
</tr>
<tr>
<td>Manitoba</td>
<td>mid-Aug</td>
<td>$90</td>
<td>Oct 4, 2016 (legal documents if applicable); Nov 1, 2016 (transcripts)</td>
<td>Nov 1, 2016</td>
<td>Jan Feb-Mar mid-May</td>
<td></td>
</tr>
<tr>
<td>McGill</td>
<td>Sep</td>
<td>$144</td>
<td>Nov 1, supplementary submissions by Nov 15</td>
<td>-</td>
<td>Jan Feb -</td>
<td></td>
</tr>
<tr>
<td>Dalhousie</td>
<td>July</td>
<td>$70</td>
<td>Aug 15, 2016; Sept 1, 2016 (supplemental)</td>
<td>Must take MCAT by August 25, 2016</td>
<td>Oct Nov Mar</td>
<td></td>
</tr>
<tr>
<td>Memorial University</td>
<td>July</td>
<td>$231</td>
<td>September 15, 2016</td>
<td>October 12, 2016</td>
<td>Oct Nov 5 Feb-May</td>
<td></td>
</tr>
</tbody>
</table>

Note: blank fields indicate variable information
<sup>1</sup> In Province / Out of Province rates

Table 11: Deadline Information for Ontario Medical Programs (OMSAS)

<table>
<thead>
<tr>
<th>Deadline to create a profile</th>
<th>Application Due</th>
<th>Registration Fee Due</th>
<th>MCAT Score Submission Deadline</th>
<th>First Offers of Admission</th>
<th>Final Transcript Due</th>
</tr>
</thead>
</table>

Table 12: Ontario University Interview Dates

<table>
<thead>
<tr>
<th>University</th>
<th>Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>McMaster University</td>
<td>Mar-Apr 2017, CASPer (online assessment) in October, 2016</td>
</tr>
<tr>
<td>Northern Ontario School of Medicine</td>
<td>Mar-Apr 2017</td>
</tr>
<tr>
<td>University of Ottawa</td>
<td>Feb-Mar 2017</td>
</tr>
<tr>
<td>Queen’s University</td>
<td>Mar-Apr 2017</td>
</tr>
<tr>
<td>University of Toronto</td>
<td>Feb-Apr 2017</td>
</tr>
</tbody>
</table>
iii. Application Questions and the PSE

You have spent the past three to four years working towards good grades, solid MCAT scores, meaningful volunteer and research experience, and having a social life. If you think back on everything you have accomplished as an undergraduate, what stands out? Is it the competitive swimming team you joined as a freshman, and are now coaching? How about the volunteer program you organized to help underprivileged children at the local high school? Or was it the fact that you are an executive member of your science undergraduate society?

As part of your application to medical school, you will likely be required to answer a series of application questions as well as provide a Personal Statement of Experience (PSE). Applicants typically find this section of the application the most challenging. However, in this part of the guidebook, you will find some great ways to help you start thinking about how to write a memorable—and successful—PSE.

There is no “magic formula” when it comes to writing a personal statement. Some students prefer to write an anecdotal essay, in which they focus on a particular experience that perhaps gave them a wider world view. Others prefer to write in a chronological style, through which they examine their growth as an individual from a broader perspective. Both methods have proven to be successful. But keep in mind that the personal statement is a chance for you to set yourself apart from the other applicants! Show the admissions officers that you are more than a set of numbers and really try to bring to life your character and personality through this opportunity.

To make sure that your essay stands out from the sea of personal statements admissions committees are bound to read, you’ll need to write about something unique to you. This may be an activity in which you have participated, or this may be about challenges that you’ve faced and lessons you’ve learned through overcoming or combating that obstacle. The key is this: it is not what you write about, so much as how you write about it. For example, every Science Undergraduate Society President likely has an eye on medical school, so the fact that you were President of your SUS is not unique; however, if you can tell a compelling and unique story about why being President made you who you are, or how being President drove you to want to pursue medicine, you’re on the right track. Your story will make you stand out.

In addition to a PSE, some schools may require an “Autobiographical Sketch”, which is generally an enumeration of all your extracurricular activities to date, divided into categories such as employment, volunteer activities, club/interest groups, leadership, awards and accomplishments, research, etc. This is a chance to go into detail about your various activities, whereas you might have been constrained by word limits in the PSE. However, one should be careful not to include things just for the sake of including them: as stated on the OMSAS website, “One should include experiences that demonstrate an ability to determine needs in the community and a willingness to play a part in filling those needs”.

For details on the specific requirements of a particular medical school, you should consult the school’s website.
v. Letters of Reference

Reference letters are an essential part of your application. They allow medical schools to get a sense of your personality, and to evaluate your ability to form positive relationships. Most schools require two or three letters of reference. These should be written by someone who knows you: just because your cousin’s friend happens to be a neurosurgeon with a lot of credentials after his name does not mean he is a good reference for you! Ensure that your referees can write positive, accurate, and detailed letters to support your application.

When it comes time to ask for a letter of reference, make sure that the person you ask is comfortable with the task. Be clear with what you are looking for, and ensure that the person you are asking will be able to write you a “positive” letter. You can help your referee out by offering to sit down with them for an interview in order to get to know you better. Bring a copy of your CV and a list of qualities that you think describe you. Do not forget to give your referee enough time to write you a good letter. Approaching a referee one week before the deadline will likely fail to impress, and could cause you to miss the application deadline.

Finally, ensure that you follow up with your referees. Do not expect them to remember deadlines: it is your responsibility to make sure your application is completed on time. Provide a friendly reminder in person or by email depending on the availability of your referee.

vi. Supporting Documents

You will also be required to submit supporting documents with your application, such as school transcripts and proof of citizenship/residency. You may also be required to submit proof of proficiency in English. You can consult RedBooks (redbooks.sus.mcgill.ca) and the school websites for more details.

vii. The Interview

The final step of your application to medical school is the interview. While many students find interviewing the hardest part, there is no reason you won’t do well if you know how to prepare. CaPS offers workshops to help students practice their interview skills. McGill Career Advisors also offer one-on-one sessions by appointment. For more information, check out the CaPS website at http://www.mcgill.ca/caps/.

There are two very different styles of medical school interview. You should check with each school to find out what type of interview to expect. The table below offers some key information about each style.

"An appropriate referee is someone who is able to vouch for your character and your abilities...[someone] who you have been in a relationship with such as a coach or teacher or a supervisor...that's the kind of person that we're looking for."

- Dr. Saleem Razack, Associate Professor of Paediatrics and Core Faculty at the Centre for Medical Education at McGill University
Table 13: Interview Styles

<table>
<thead>
<tr>
<th>What it looks like</th>
<th>How to do well</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traditional Question-Answer</strong></td>
<td><em>Take the middle ground:</em> Don’t just say what you think the interviewer wants to hear, but also don’t be too radical in your answers. Remember, this is not a time to be dogmatic. <em>Personalize your answers:</em> Take the time to get to know yourself. Think about how each of your experiences has influences you. This can help make your answers more personal and memorable. <em>Organize your thoughts:</em> What you say is important, but how you say it is key. Think before you speak. <em>Be aware of current issues:</em> Show that you are well-informed by talking about current events.</td>
</tr>
<tr>
<td>One student is interviewed by one or two members of the admissions committee or medical school faculty. The student is asked to respond to a series of personal questions, as well as some questions regarding current world issues. Sometimes, a current medical student is also present to answer any questions the applicant may have at the end of the interview.</td>
<td></td>
</tr>
</tbody>
</table>

| **Multiple Mini Interviews (MMI)**                                               | *Relax:* The MMI is designed to allow an applicant to demonstrate social, logic and communication abilities. You will need to be relaxed in order to do a good job. *Be natural:* The interviewers want to see how you would respond to a given situation. *Be creative:* That said, it won’t hurt to be inventive in your responses. There is no “wrong answer” in the MMI; so long as you are completing the given task, you’re on the right track. |
| The MMI was pioneered at McMaster University, and is designed to test “non-cognitive characteristics” associated with being a good doctor. The interview format reduces examiner bias and provides many chances for a candidate to express his or her personality. Candidates rotate around 10 stations, for approximately 10 minutes each. At each station, they are presented with a scenario. Candidates have approximately 2 minutes to acquaint themselves with the scenario, and approximately 8 minutes to respond to it in front of the team of interviewers. Some sample scenarios are summarized below. |                                                                                   |

<table>
<thead>
<tr>
<th>Sample MMI Scenarios:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parking Garage (Communication Skills)</strong> – The parking garage at your place of work has assigned parking spots. On leaving your spot, you are observed by the garage attendant as you back into a neighbouring car, a BMW, knocking out its left front headlight and denting the left front fender. The garage attendant gives you the name and office number of the owner of the neighbouring car, telling you that he is calling ahead to the car owner, Tim. The garage attendant tells you that Tim is expecting your visit. Enter Tim's office.</td>
<td></td>
</tr>
<tr>
<td><strong>Placebo (Ethical questions)</strong> – Dr. Cheung recommends homeopathic medicines to his patients. There is no scientific evidence or widely accepted theory to suggest that homeopathic medicines work, and Dr. Cheung doesn't believe them to. He recommends homeopathic medicine to people with mild and non-specific symptoms such as fatigue, headaches and muscle aches, because he believes that it will do no harm, but will give them reassurance. Consider the ethical problems that Dr. Cheung's behaviour might pose. Discuss these issues with the interviewer.</td>
<td></td>
</tr>
<tr>
<td><strong>Etiquette:</strong> As with all interviews, general etiquette rules apply: turn off your cell phone, don’t chew gum, and be otherwise polite and respectful. Remember to follow an appropriate dress code. Overly casual or provocative clothing should be avoided. Above all, be friendly and act naturally.</td>
<td></td>
</tr>
</tbody>
</table>
Canadian Medical Schools

a. A Typical Canadian Curriculum

Most Canadian medical programs follow a general structure: two years of in-class learning, followed by two years in a hospital setting. More recently, some schools have begun reducing their programs to two years in-class followed by one year in a hospital setting. This is not to say that your experience is reduced, but it is designed specifically to get future doctors out into the workforce or provide a change to specialize earlier.

During the first and second years, students go through integrated systems-based instruction on the basic sciences in a coordinated series of units. The curriculum is designed for students to have the opportunity for small group activities in labs and discussion groups, as well as independent learning activities supported by computer-assisted instruction. There are formative and summative assessments throughout many units with reduced emphasis on final examinations. Class size and teaching methods vary from school to school. Some medical schools may emphasize teaching one subject at a time, smaller classrooms, and discussing case studies during lecture, while others may feature larger classes similar to undergraduate courses.

The first 18 months cover the basic knowledge required to practice medicine. First year courses focus on the human body and likely include anatomy, histology, biochemistry, embryology, and neuroanatomy. In a MedCasts interview, when asked how his undergraduate education prepared him for medical school courses, R.J., a former Honours Physiology student currently studying medicine at McGill, said, “[It] definitely made the first one and a half years much easier - we had seen almost all of the material before in a different context. The downside to this was that it also made things somewhat boring and repetitive during that time, but we still had to study.” There are some critical points at which a medical education differs from a general undergraduate one. As R.J. explains, “one major difference from undergrad [is] the sheer amount of material that we are expected to absorb in one unit.” In medicine, students must be comfortable with learning many facts in a very short time.

Students are introduced to clinical medicine in their second year and become familiar with in-patient and ambulatory settings. They are taught to do physical examinations, consider medical ethics, and practice evidence-based medicine. They also do rotations in various clinical disciplines. Second year consists of courses on disease and treatment, courses such as pathology, pharmacology, microbiology, and immunology. Additionally, students are trained in how to interact successfully with patients. American medical schools require students to sit the United States Medical Licensing Examination before clinical training (at the end of their second year). While the exam is not required for Canadian licensing, students are advised to sit this examination if they wish to train or practice in the United States.

Third and fourth year are the internship periods, also called clerkship, where students experience first-hand different medical specializations. Rotations that require more responsibility are done during the fourth year. Electives are also offered during fourth year. Students must decide which medical specialty they are interested in as part of their application to a residency program.

Once undergraduate medical education is completed, the student receives the title of Doctor. However, this neither implies the ability to practice medicine independently, nor the completion of medical training.
For more detailed information on the undergraduate medical school curriculum of a particular university, it is best to check with that school’s Faculty of Medicine.

Included below is a general outline of McMaster’s Michael G. DeGroote School of Medicine’s curriculum. This is just to provide a vague idea of what to expect. Most medical schools have detailed curriculum outlines on their websites. Reading these outlines may give you a better idea of what to expect, come medical school, and which schools’ curricula resonate with you personally.
a. Being an International Medical Graduate (IMG)

An International Medical Graduate (IMG) is a physician who received a medical degree outside of a Canadian medical school (accredited by the Committee on Accreditation of Canadian Medical Schools), or outside of a United States medical school (accredited by the Liaison Committee on Medical Education). In Canada, the term IMG refers to the place of medical education. An IMG may be:

- a Canadian citizen or permanent resident who went abroad to study medicine
- a Canadian citizen or permanent resident who studied medicine abroad before immigrating to Canada
- a citizen of another country who studied abroad and is visiting Canada temporarily to study, teach, or do research
- a citizen of another country who studied medicine and lives abroad

For IMGs to practice medicine in Canada, they must fulfill several requirements, including licensing exams and proof of language proficiency. In addition, each province also has its own requirements.

Many students who study abroad choose not to return to Canada, and instead remain in their country of study or find work elsewhere. For more information, visit www.img-canada.ca.

Each year many Canadian students go abroad in order to pursue a medical education. In this section you will find a brief but helpful guide to applying to Ireland, the Caribbean, the US and Australia (four popular destinations among Canadians) and a list of resources that you can access for further information.

b. Ireland

Ireland is a popular destination for Canadians, mostly because an Irish M.D. allows them to practice medicine virtually anywhere. However, an Irish medical education can be very expensive. Most students tend to return to either the US or Canada after medical school. An Irish medical degree is accepted in all Commonwealth countries, EU nations, the US and Canada; however, graduates must take the licensing exams just as any other medical student in the US or Canada. It can be difficult to get into a Canadian residency program after attending an Irish medical school, so many students end up practicing in the US. There are approximately 7,000 residency spots for non-US med school graduates. Most forums, such as the Student Doctor Network (SDN), suggest that students wishing to obtain a residency in the US or Canada should opt to do their Elective in these countries, as this can help a residency application.

Universities:

- University College Cork – www.ucc.ie
- University College Dublin – www.ucd.ie
- University of Limerick – www.ul.ie
- The Royal College of Surgeons in Ireland – www.rcsi.ie
- National University of Ireland, Galway – www.nuig.ie
- Trinity College Dublin – www.tcd.ie
Application: To apply to Irish medical schools, North American students must go through the Atlantic Bridge program (www.atlanticbridge.com). Generally, three references are required. Once the preliminary application is accepted, an applicant will be required to interview with the universities’ representatives in North America. Requirements for application to the four-year program include a bachelor’s degree and valid MCAT scores. Scores and GPA cut-offs differ at each university, and details are available at each university’s respective website. However, it is generally noted that the requirements are not as demanding as those of Canadian and US schools.

Programs: The curriculum is delivered over four years: Junior, Intermediate, Senior 1 and Senior 2. The core biomedical sciences, medical sciences, behavioural sciences and clinical competencies are the focus of the Junior and Intermediate Cycles. The two Senior Cycle years concentrate on clinical medicine and its subspecialties. At first, students get to work with simulated patients but by second year begin having direct patient contact in a hospital affiliated with the university.

Fees: The tuition fees range from 40,000 to 50,000 EUR, per year (approximately 50 000 to 70 000 CAD per year at the current exchange rate). This may sound expensive, but there are many ways to finance a medical education. These options are included at the end of this section, as it applies to all universities.


c. Caribbean

Select Universities:
- Ross University (Dominica)
- St. George’s School of Medicine (Grenada)
- Saba University (Saba)

Caribbean universities are becoming more popular among Canadian students, as their fees are quite low compared to other international schools. At many Caribbean schools, the last two years (clinical training) take place in an American hospital.

Application: The MCAT is optional for most Caribbean schools. An undergraduate degree, a letter of recommendation, an essay and an interview are required. A competitive applicant generally has a GPA of 3.2 and MCAT scores of roughly 124 in each section. Required courses include one year of each of General (Inorganic) Chemistry, Organic Chemistry, Physics, Biology and English. One semester of Mathematics is also required.

Program: Detailed information about each school’s program can be found online. In general, elective placements occur in American universities and are approved by the university. This offers a great advantage to students wishing to live and practice medicine in either Canada or the US.

d. USA

Many Canadian students choose to study medicine in the US. Unlike Canada, the US has hundreds of medical schools; it is therefore necessary to do thorough research about each school’s individual program and requirements before applying. It is also important to note that many state universities do not consider out of state applicants; in general, private universities do accept Canadian students, but their tuition fees are high, making an American education very costly.
**Application:** Students apply to American universities via AMCAS (American Medical College Application Service). Applicants must submit a Primary Application, which includes an autobiographical essay. Each school has its own Secondary Application, which typically includes more essay questions. Applicants must submit references and transcripts and, where applicable, must attend interviews. Note that the schools will not come to the applicant: applicants must travel to each university for interviews, making applying to the US a time-consuming and costly endeavour.

**Requirements:** Each university has specific requirements. In general, they tend to require:
- 1 year of General Chemistry (with lab)
- 1 year Biology (with lab)
- 1 year Physics (with lab)
- 1 year Calculus
- 1 year Organic Chemistry (with lab)
- ½ year Molecular Biology
- ½ -1 year of Biochemistry (only a handful of schools want a full year; also note that BIOL 201 counts as a biochemistry course since it includes metabolism)
- ½ -1 year of English
- 1 year of humanities (any two courses which are considered Humanities, e.g. Economics, Sociology, Anthropology, etc.)

Please note however, that these prerequisites do not apply to all of the American medical schools. Many may not even have any prerequisites while others may have even more specific requirements. Make sure to make yourself acquainted with the criteria of your specific schools of interest.

MCAT scores are required by all US schools, and much emphasis is put on an applicant’s performance on this test. School-specific cut-offs are available at each school’s website. A highly recommended guidebook is the Medical School Admission Requirements (MSAR). It provides detailed information on GPA, MCAT scores and other statistics, and can be ordered online via the AMCAS.

**Visa:** Everyone has to get an F1 visa. You can find more specific information at [http://educationusa.state.gov/](http://educationusa.state.gov/) and [http://www.unitedstatesvisas.gov/](http://www.unitedstatesvisas.gov/).

**e. Australia**

Medical education in Australia has undergone significant changes over the past few years, incorporating earlier contact with patients, problem-based curricula and an increasing emphasis on community-based education. Such changes—along with the fact that tuition in Australia is much less costly compared to that in the US—are the primary reasons why this country is becoming an increasingly popular destination for post-graduate students seeking an M.D.

To transfer an Australian medical degree back to Canada, a student must complete the Medical Council of Canada Evaluating Examination (MCCEE), which is a 4-hour computer based assessment consisting of 175 multiple-choice questions. International medical students in their final clinical year are required to take the MCCEE as a prerequisite to the two MCC Qualifying examinations that are taken upon returning to Canada. IMGs must pass the MCCEE in order to apply for a residency position through the Canadian Resident Matching Service (CaRMS).

**Regional Universities:**
- University of Wollongong
- Deakin University
- University of Sydney
- Australian National University
For more universities, refer to degreesoverseas.com, an excellent resource for international post-graduate students wishing to attend medical school in Australia.

**Application:** Australearn is a Canadian application centre that offers free application, enrolment and pre-departure services to medical students wishing to apply to the 7 graduate entry medical schools listed above. Entry requirements and competitiveness vary amongst different schools; however, in general, a competitive applicant must obtain a GPA of 2.7 or above accompanied by total MCAT scores of 498 or above. All applicants must have a bachelor’s degree (in any area), but there are no specific pre-requisite courses (premedical or other). The one exception is the University of Melbourne MD Program which requires a bachelor’s degree in any field and successful completion of pre-requisite studies in anatomy, physiology and biochemistry consisting of at least one subject at second-year level of each. All schools require a formal interview as part of the application process for international applicants, except for the University of Queensland. In many cases, interviews are conducted in the applicant’s region so that overseas travel is not required.

**Program:** The Australian medical school system places significant emphasis on providing students with hands-on clinical experience in all 4 years of study. In general, students in Years 1 and 2 have weekly small group tutorials with clinicians and are likely to see patients in hospital wards regularly with their tutors. Development of clinical skills by students is supported by ample exposure to clinical skills and simulation laboratories. In Years 3 and 4, students work alongside clinicians in rotations in each of the major disciplines. Most schools offer varied options for rotations including experience in rural communities.

**Fees:** Tuition fees range from 40,000 AUD to 60,000 AUD, per year (approximately 37,000 to 55,000 CAD, per year).
Financing Your Medical Education

a. Tuition and Expenses

Medical school is an expensive endeavour. Tuition and other compulsory fees vary from school to school. Furthermore, certain years of study are more expensive than others. In addition to tuition, one must consider ancillary fees, books and equipment, rent, food and various other expenses. The most expensive program in Canada for non-international students is around $30 000 per year in tuition and other compulsory fees. (This number represents the fees of McMaster University. Note that while yearly tuition at McMaster is around $27 000, the school’s program is only three years.) Students wishing to study medicine in the United States or other foreign countries should be prepared to pay considerably more.

The following table summarizes the first-year tuition fees for Canadian medical programs. Also, there are other compulsory fees, including books and equipment, and membership fees, etc.; this cost varies from year to year - be sure to check out the websites of each individual school for more information. Unless otherwise indicated, the following rates are for Canadian students in 2016-2017.

<table>
<thead>
<tr>
<th>School</th>
<th>First Year Tuition</th>
<th>Tuition for International students</th>
</tr>
</thead>
<tbody>
<tr>
<td>UBC</td>
<td>$17 407.24</td>
<td>NA</td>
</tr>
<tr>
<td>Alberta</td>
<td>$12 044.16</td>
<td>NA</td>
</tr>
<tr>
<td>Calgary</td>
<td>$15 012.18</td>
<td>NA</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>$16 236.00</td>
<td>NA</td>
</tr>
<tr>
<td>Manitoba</td>
<td>$8 354.80</td>
<td>NA</td>
</tr>
<tr>
<td>NOSM</td>
<td>$23 432.00</td>
<td>NA</td>
</tr>
<tr>
<td>Schulich¹</td>
<td>$25 209.74</td>
<td>NA</td>
</tr>
<tr>
<td>McMaster</td>
<td>$27 531.77</td>
<td>$95 955.02</td>
</tr>
<tr>
<td>Toronto</td>
<td>$23 280.00</td>
<td>$69 370.00</td>
</tr>
<tr>
<td>Queen’s</td>
<td>$26 182.72</td>
<td>$92 399.86</td>
</tr>
<tr>
<td>Ottawa</td>
<td>$26 381.50</td>
<td>NA</td>
</tr>
<tr>
<td>McGill</td>
<td>$4 888.80 / $15 177.96²</td>
<td>$37 396.17</td>
</tr>
<tr>
<td>Montréal²</td>
<td>$3 179.00 / $8592.00²</td>
<td>NA</td>
</tr>
<tr>
<td>Laval³</td>
<td>$2 874.96 / $7233.66²</td>
<td>NA</td>
</tr>
<tr>
<td>Sherbrooke⁵</td>
<td>$3 613.00 / $9763.00²</td>
<td>NA</td>
</tr>
<tr>
<td>Dalhousie⁵</td>
<td>$19 215.00</td>
<td>NA</td>
</tr>
<tr>
<td>Memorial</td>
<td>$8 250.00</td>
<td>$30 000.00</td>
</tr>
</tbody>
</table>

¹ Includes ancillary fees on top of tuition
² In province/Out of Province
³ May not be the most up to date tuition information. For more accurate figures, please contact the respective schools.
b. Sources of Funding

According to the National Physician Survey of 2010, 78.9% of second-year residents indicated that they had some form of debt directly related to their medical education upon entering their residency program. The amount of debt varied widely, with 4.8% indicating that they had incurred over $160,000 of medical school-related debt.

The bottom line is that while it may be possible for some individuals to pay up-front for their medical education, most medical school students will require some form of financial aid to finance their three or more years of medical school. This aid can take the form of government loans and grants, scholarships, bursaries or lines of credit.

It is important to explore all your options when considering how to fund your medical education. There are plenty of resources available, but only to those who seek them out. A good place to start your research is your medical school’s website; most of these sites will have a financial aid section with useful links and contact information.

i. Government Student Loans

The Canadian government works with the provinces and territories to provide funding for students completing their post-secondary education, with the exception of Quebec, Nunavut and the Northwest Territories, which administer their own financial aid. Though a single application is required, the two scholarships are administered separately.

In order to qualify for a loan or grant, several conditions must be met including Canadian citizenship/permanent residency and demonstration of financial need. Once you apply for a government loan and are found eligible, your eligibility is automatically assessed for most Canada Student Grants; in certain cases, a separate application may be required. For detailed information regarding loan and grant eligibility, visit http://www.canlearn.ca/eng/postsec/getloan/elg.shtml.

The amount of aid you receive is dependent on several factors. The CanLearn website (www.canlearn.ca) provides a tool to help you estimate the amount of aid you are eligible for.

Government loans are interest-free while you are completing your studies.

ii. Grants, Bursaries and Scholarships

Each medical school allocates a substantial amount of money each year to helping their students pay for their education. A full description of all grants, bursaries and scholarships available can be found on their websites. Most, though not necessarily all, take financial need into account when evaluating candidates. Check out the websites to determine which scholarships you would be eligible for and take note of which required an application and when the application would be due.

iii. Lines of Credit

A third option is to secure a line of credit from one of the major Canadian banks. Most banks will offer students enrolled in a medical program a line of credit up to $200,000 at prime interest rate or prime + 1-2%. Maximum annual amounts vary between $30,000 and $50,000. Most plans require only interest payments while you are completing your studies and your residency. As with other lines of credit, you would only pay interest on the amount you use. Repayment of the “principle” (i.e. the majority of the sum
you borrowed) does not start until a year after you finish residency. Each bank offers different terms and conditions, so if you are considering a line of credit, you should contact the appropriate representative.

iv. Incentive Programs

The need for doctors in Canada is not evenly distributed; many rural communities are in desperate need of physicians. Many provinces have incentive programs designed to encourage medical school graduates to practice in high-need areas. These programs often offer grants or tuition refunds to help finance your medical education.

Here are two examples of provincial incentive programs:

**Manitoba, Medical Student/Resident Financial Assistance Program (MSRFAP):** Fourth year medical students enrolled at the University of Manitoba are eligible for grants of $25,000, in return for a commitment to work in a rural or northern community in Manitoba for one year upon completion of their residency, though restrictions on language of study and location of study apply. There are also special programs for family medicine and specialist residents who will also have to, in return, work in underserved communities for varying amounts of time. Visit [http://www.gov.mb.ca/health/msrfap/](http://www.gov.mb.ca/health/msrfap/) for further information.

**Ontario, Free Tuition Program:** Ontario medical students in the final year of their program or enrolled in a residency program are eligible for a refund of their tuition in return for three to four years of work in an underserviced Ontario community upon completion of their residency. Candidates may also be eligible for other incentive programs that aim to recruit physicians to underserved areas. Visit [http://www.ontla.on.ca/library/repository/mon/ont/h/2000/tuition.htm](http://www.ontla.on.ca/library/repository/mon/ont/h/2000/tuition.htm) for information.

c. Studying Internationally

When it comes to studying medicine in a foreign country, the situation becomes slightly more complicated, and is beyond the scope of this guidebook. Your best course of action is to contact the financial aid office of the school that interests you.

Most Canadian students studying outside the country are still eligible for government aid, though the amount may be different. To find out more, contact your provincial financial aid office.

Residency

After completing your undergraduate medical studies, the next step is residency. Residency usually takes three or more years to complete and gives students the opportunity to learn in the clinical setting of a hospital or other health care centre. This phase of medical training also allows for specialization in one of the many disciplines of medicine. The speciality chosen during residency will likely be the practising field for the rest of any doctor’s career, so it isn't a decision that should be made hastily. What skills does this discipline require? What type of lifestyle can one expect in this field? How much training is needed? These are all questions to be addressed before making such an important decision.

a. Canadian Resident Matching Service

Matching an aspiring resident to a Canadian postgraduate medical school is handled by the Canadian Resident Matching Service (CaRMS), an independent non-profit organization that works as a bridge between applicants and medical schools. Students are asked to submit applications and rank the programs that are offered by schools across Canada. The various medical schools then rank the applicants based on their submitted applications.

b. The American Way

Medical schools in the United States use a similar private, non-profit organization to handle the matching process. The National Resident Matching Program (NRMP) uses the same techniques as CaRMS to match students with residency programs. Just as in Canada, residency takes the form of paid on-the-job training, usually in a hospital.

c. Being a Resident

Residents care for patients directly and learn from the cases they come across. A resident’s duties primarily involve treating patients, performing medical histories, reviewing patient updates, writing admitting orders and handling cases with a group of fellow residents. This is often supplemented by brief lectures or conferences which focus on clinical skills.

Residents are often “on call”, and may be expected to work at the hospital upwards of 24 hours every 2nd, 3rd, or 4th day. Although this may be daunting, long hours are reasoned to give residents the opportunity to handle as many cases as possible and to learn from those experiences. Canadian residents are paid workers, receiving salaries ranging from $44,000 to $96,000, depending on province of employment and resident year.

d. Specialties

There are many different specialties, some of which are listed below. An exhaustive list of recognized medical specialities in Canada is available on the website of the Royal College of Physicians and Surgeons of Canada at http://rcpsc.medical.org/information/index.php
**General Practitioners (or Family Physicians)** demonstrate competence in the patient-centred clinical method. They show an understanding of patients’ experience of illness (particularly their ideas, feelings, and expectations) and of the impact of illness on patients’ lives. Family physicians have an expert knowledge of the wide range of common problems of patients in the community, and of less common, but life threatening and treatable emergencies in patients in all age groups.

**Anatomical Pathology** is the study of the morphologic aspects of disease and includes subspecialties that may be oriented towards specific organ systems.

**Cardiac Surgery** is the study of diseases of the pericardium, heart and great vessels. Cardiac surgeons diagnose and manage patients with cardiac disease, perform surgery, and offer postoperative care.

**Community Medicine** deals with the health of populations. The Community Medicine specialist uses population health knowledge and skills to play leading and collaborative roles in the maintenance and improvement of the health and well-being of the community through health promotion, disease prevention and health protection. The Community Medicine specialist demonstrates skills in leadership, development of public policy, design, implementation and evaluation of health programs and applies them to a broad range of community health issues.

**Emergency Medicine** is concerned with the management of acute illnesses and injury in all age groups.

**Forensic Pathology** is a subspecialty of Anatomical Pathology and General Pathology which applies basic pathologic principles of the two specialties to the medical and judicial systems to determine causes and manners of death.

An **Internist** is a specialist trained in the diagnosis and treatment of a broad range of diseases involving all organ systems, and is especially skilled in the management of patients who have undifferentiated or multi-system disease processes. An internist cares for hospitalized and ambulatory patients and may play a major role in teaching or research.

**Medical oncologists** are physicians who use medications (chemotherapy, hormones and analgesics) to treat and manage cancer.

**Neurology** is the study of the nervous system in health and disease.

**Ophthalmologists** are physicians who specialize in the diagnosis and treatment of all eye problems, including injuries and medical disorders. These medical disorders may involve the eye alone or the eye in association with other general medical conditions. They may prescribe eye glasses and contact lenses to improve sight and can perform surgery for eye conditions such as cataracts.

**Orthopedic surgeons** are physicians who treat problems involving ligaments, joints, muscles, tendons and related structures. They commonly treat back problems, fractured bones, muscle tears, and sports related injuries.

**Plastic Surgery** focuses on the management of complex composite tissue defects.

**Psychiatry** is the branch of medicine concerned with the biopsychosocial study of the etiology, assessment, diagnosis, treatment and prevention of mental, emotional and behavioural disorders.

**Transfusion Medicine** is the branch of laboratory and clinical medicine that deals with all aspects of the collection, testing, preparation, storage, transportation, pretransfusion testing, indications for, infusion and safety of human blood components and products, nonhuman alternatives and alternative products manufactured by recombinant DNA technology.
Practicing Medicine in Canada

a. Licensing

Once a medical student has completed a residency program at a certified institution, he or she needs to earn a license to practice. There are several ways to obtain a license in Canada:

**College of Family Physicians of Canada:** This organization provides the examination for residents of family medicine who have completed at least 24 months of residency. Residents can write the exam within the last six months of their training. Certain graduates from the United States, Australia, and the UK can also qualify for the examination. Visit http://www.cfpc.ca for more information.

**Royal College of Physicians and Surgeons of Canada:** The Royal College of Physicians and Surgeons of Canada is the national body that certifies specialists in all branches of medicine and surgery, except family medicine. There are two steps to gain certification: assessment and examination. In the assessment process, residents must apply to have their residency program verified by the organization to ensure that the program has met the standards of training. The examination tests an applicant’s knowledge base and critical thinking skills. See http://rcpsc.medical.org for more information.

**Collège des Médecins du Québec:** This is specifically for residents who wish to practice medicine in Québec. To be eligible for certification, residents need a working knowledge of French. If they cannot provide proof of this, they must take a test to do so. Residents in family medicine must have 2 years of postgraduate training, and those who choose to specialize must have 5 to 6 years of training, depending on the specialty. Residents must also take an examination to obtain full certification. See www.cmq.org for more information.

Upon completion of the required conditions, the physician is issued an Independent Practice Certificate. This authorizes the holder to engage in independent, unsupervised medical practice, but limits him or her to the area (province) and specialization. The holder of the Independent Practice Certificate is entitled to all the rights and responsibilities of a physician in that province or territory and must pay an annual membership fee to maintain the Certificate.

b. Ethics

A doctor has access to patients’ private information and must abide by confidentiality rules and ethical guidelines. Physicians in Canada are bound by a Code of Ethics, as outlined by the Canadian Medical Association. According to the Code, “fundamental” responsibilities demand that physicians think “first [of] the well-being of the patient...engage in lifelong learning…[and] refuse to participate in or support practices that violate basic human rights...”. The full Code of Ethics can be found on the Canadian Medical Association’s website. Visit www.cfpc.ca for more information, including common ethical questions faced by doctors.
c. Work Conditions

i. Environment

The work environment of a doctor depends largely on the type of work he or she does. General practitioners (GPs) and family physicians tend to work in private practices, hospitals and clinics. Some work in group practices in order to reduce the costs of running an office and to provide support for each other. Specialists and surgeons often work in hospitals, though many have private practices as well.

Working in a rural community as opposed to an urban area poses its own sets of challenges. Specialists are less common or farther away, so GPs are expected to provide a wider range of services. Many programs are in place to attract doctors to rural settings, including recruitment bonuses and bursaries.

ii. Work hours

There is no doubt about it – doctors work hard. The most recent National Physician Survey took place in 2010. It was reported that the average work week for the employed Canadian was 36.2 hours. In contrast, the average work week for the Canadian doctor was 51.4 hours, not including time spent on-call. According to the 2010 data, specialists work slightly more hours per week than general practitioners, while men tend to work more hours than women.

d. Income and Expenses

With hefty tuition fees and years of hard work in mind, many students wonder just how much money they can expect from a career in medicine. Remuneration methods for doctors vary by province and by specialty. A common method is “Fee-for-service”, where each time a patient visits a doctor, the doctor bills the provincial government for the service or procedure performed. Some doctors are paid by salary; others earn their money by the day or by the hour. Still others are paid by a “blended” model which, as the name suggests, is a combination of several earning methods.

In 2009, family doctors were making upwards of $200,000 per year. Specialists tend to make more money than general practitioners, with surgical specialists earning the greatest annual salaries. While doctors certainly make enough to live very comfortably, medicine is not the highest paying job out there; pursuing medicine simply for the money is unlikely to be worth it!

e. Shortage of Doctors in Canada

A big problem in Canada is the lack of doctors. Many people, both in small communities and large cities, lack a family doctor and therefore are not able to access essential health services. In June 2010, Statistics Canada reported that 15.2 percent of the population over the age of twelve could not find a family doctor. Medical students are increasingly more interested in specializing, so remote communities receive fewer GPs. In addition, the IMG (International Medical Graduate) restrictions make it hard for international medical students to practice in Canada. The Canadian government is currently aiming to encourage more doctors to become GPs by funding more hospitals for residency GP programs.

For more information, visit www.nationalphysiciansurvey.ca.
Continuing Medical Education

Health practitioners do not stop learning after medical school. The need to maintain competence and to learn about new and developing areas of the medical field inspired the creation of activities formulated to do just that. Grand rounds, case discussions, and journal clubs constituted beneficial learning experiences, as they encouraged discussion among peers and allowed physicians to cover more material than they would on their own.

Today, these activities have become more sophisticated and have grown to include conferences, written publications, online programs, audio courses, videos, and other electronic media. Interactive self-reflective learning programs are developed, reviewed, and sometimes even presented by Key Opinion Leaders or specialists in the field, ensuring the quality of information delivered. Together, such programs are referred to as Continuing Medical Education (CME).

a. Requirements

Physicians can subscribe to a variety of recognized organizations through which they can maintain their accreditation. In addition to processing the certification of events, these organizations approve programs, oversee the activities and provide networking opportunities.

Canada: Certification is provided by the College of Family Physicians of Canada (CFPC) and the Royal College of Physicians and Surgeons of Canada (RCPSC). The CFPC requires 250 credit-hours over a five-year cycle, with a minimum of 50 credits earned each year. An additional 24 credit-hours of higher learning per cycle are also required to earn and maintain fellowship within the college. Moreover, each province and territory requires documentation of ongoing CME for licensure. The RCPSC certifies its specialist physicians through the Maintenance of Certification Program. For each five-year cycle, fellows are required to document 400 credits, with a minimum of 40 credits per year.

United States: Many states require CME for medical professionals to maintain their licenses. The major accrediting body is the Accreditation Council for Continuing Medical Education (ACCME).

b. Recognized Societies

College of Family Physicians of Canada (CFPC): Founded in 1954, the CFPC is the national medical association which supports family physicians in providing high quality health care to their patients. Each province and territory has its own chapter. Although members were always required to participate in CME, in 1995, the College introduced MAINPRO® (Maintenance of Proficiency), an integrated and comprehensive program tying together the various policies pertaining to CME. Designed to be flexible and fair, MAINPRO® is based on the principles of adult learning, enabling members to maintain their practice knowledge and skills. It includes the guidelines for maintenance of membership and maintenance of certification.

Fédération des médecins omnipraticiens du Québec (FMOQ): Although the CFPC has a Québec Chapter, the FMOQ was developed to serve family physicians in Québec. In addition to offering their own Plan d’autogestion de développement professionnel continu (PADPC) structure to CME programs, family physicians can submit the same program for CFPC credits.
Royal College of Physicians and Surgeons of Canada: The RCPSC is a national, private, nonprofit organization established in 1929 by a special Act of Parliament to oversee the medical education of specialists in Canada. It is an organization of medical specialists dedicated to ensuring the highest standards and quality of health care. A physician may be certified by the RCPSC without becoming a Fellow of the College. Fellows use the designation FRCPC (Fellow of The Royal College of Physicians of Canada) or FRCSC (Fellow of The Royal College of Surgeons of Canada) depending on their qualifications.

Accreditation Council for Continuing Medical Education (ACCME): The ACCME sets and enforces standards in physician education within the United States. Its mission is to provide physicians with opportunities to maintain competence and learn about the latest developments in medicine.

c. Accreditable Activities

Please note that this is a general description of the types of programs the CFPC may accredit and be eligible for Mainpro-M1 credits (only one of three different types of credits).

Group Learning Activities: Conferences, courses, workshops, scientific assemblies, lectures and seminars, in addition to clinical rounds and journal clubs involving groups of physicians are eligible for Mainpro credits (so long as they have been approved by the CFPC).

Academic Activities: Faculty development activities, conducting research and preparing manuscripts for publication are all types of academic activities that are eligible for Mainpro-M1 credits. A maximum of 75 credits may be claimed for any combination of these activities during any 5-year cycle.

Contributing to the medical community: Members make contributions to the medical community, either through participation in a medical community, being an examiner for family or emergency medicine examinations, or being a peer reviewer for medical journals. Members are often exposed to material that can be applied directly to their practices and are thus eligible for credits. A maximum of 75 credits may be claimed from these activities over a five-year cycle.

Self-Reflective Learning Activities: Mainpro credits can be claimed for self-reflective learning activities such as internet-based studies of critically appraised peer-reviewed articles, or practice audits (physicians evaluate treatment and practice habits, assessing their performance). CFPC members who reside and practice in the United States and who wish to maintain their CFPC membership may claim Mainpro credits for these.

Individual consideration: In special circumstances, members can request that an unaccredited learning activity (e.g. traineeships, fellowships and medical missionary activities such as Médecins sans frontiers) be considered for Mainpro credits.

d. Resources

The following websites offer more information regarding continuing medical education:

ACCME: www.accme.org
CFPC: www.cfpc.ca
FMOQ: www.fmoq.org
RCPSC: www.royalcollege.ca
Alternative Careers in Health Sciences

a. Medical Research

A viable alternative for classic medical school exists in the turf of medical research. There are countless areas of interesting and rewarding fields of study. If you have an inquisitive mind and a thirst for knowledge, then biomedical research might be just what you are looking for.

i. Graduate Research

The most common graduate program within the Faculty of Science is the M.Sc. – Master of Science – degree. From Anatomy and Cell Biology to Experimental Medicine and Physiology, a huge variety of Graduate programs are available at McGill, as well as many other universities. A M.Sc. degree usually includes a variety of courses, seminars, reading and conference courses, as well as a research project. Another common degree is a PhD – Doctor of Philosophy. This is a more academically advanced version of the M.Sc. and usually requires a Master’s degree to apply.

Graduate studies are a great opportunity to further your specialization in a particular field, participate in research, and gain experience for a future career. The following is a short list of common M.Sc. programs offered at McGill. To see if a subject you are interested in is available, you can search for it on the following website: https://home.mcgill.ca/gradapplicants/programs/.

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Description</th>
<th>Admission Requirements</th>
<th>Length</th>
</tr>
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</table>
| Biology               | - training in areas including molecular biology and genetics, ecology, evolution, neurobiology, plant biology  
                        | - main component is a thesis embodying the results of original research  
                        | - also offers specialized programs in Neotropic Environments, Bioinformatics, and Environment | - B.Sc. in proposed field of study  
                        |                                                                     | - overall CGPA of 3.0/4.0 OR CGPA of 3.2/4.0 for the last two full-time academic years | - at least 3 full-time terms; typically, 2 years  
                        |                                                                     | - summer term offered for 1-year residency completions |                                        |
| Anatomy and Cell Biology | - involves original experimental work in one of the areas being actively investigated by the Department’s Research Supervisors  
                        | - some current research projects are: cell biology of endocytosis, control of cell growth and proliferation, role of hormones and their binding sites with calcified tissues, cell biology of secretion  
                        | - also offers Human Systems Biology Stream as a complementary stream to the existing MSc and PhD programs | - B.Sc. degree in life sciences or any of M.D., D.D.S. or D.V.M. degrees from a recognized university  
                        |                                                                     | - evidence of high academic achievement with a CGPA of 3.0/4.0 | - typically 2 years                                  |
| Chemistry             | - involves a balance of course work and research, designed to provide depth in an area of specialization  
                        | - distinctions: analytical/environmental chemistry, chemical biology, chemical physics, materials chemistry, synthesis/catalysis | - background in Chemistry or related fields  
                        |                                                                     | - overall CGPA of 3.0/4.0 OR CGPA of 3.2/4.0 for the last two full-time academic years | - typically 1-2 years                                  |
| Physiology            | - research areas include studies of membrane receptors, transporters and channels, to the broader integration of physiological systems including neuroscience and cardiovascular, respiratory, endocrine and immune systems  
                        | - also offers Bioinformatics option | - B.Sc degree or its equivalent  
                        |                                                                     | - overall CGPA of 3.2/4.0 OR CGPA of 3.4/4.0 for the last two full-time academic years | - recommended to be completed within two years                                  |
There are many options for research careers in a variety of fields, such as:

- population and public health
- gender and health
- nutrition, metabolism and diabetes
- musculoskeletal health and arthritis
- genetics
- cancer research
- circulatory and respiratory health
- neurosciences, mental health and addiction
- infection and immunity
- aging
- human development, child and youth health

Some corporations, such as pharmaceutical companies, are looking for employees with knowledge and skills in specific areas of research. Many research institutions such as universities and hospitals all across Canada also offer employment. To join one of these research institutions you can apply for funding from the Canadian Institute of Health Research (CIHR).

The CIHR provides funding for four themes of health research:

1. Biomedical
2. Clinical
3. Health systems services
4. Social, cultural, and environmental

To apply for CIHR funding, you must:

- Be affiliated with an eligible Canadian institution or organization by the time the funding begins
- Not be employed by Canadian federal government departments or agencies or for-profit organizations unless affiliated with a university
- Not have a financial interest holding of more than 5% in a company proposed as an industry partner for research funding

A list of eligible institutions is available here: [www.cihr-irsc.gc.ca](http://www.cihr-irsc.gc.ca). To apply, you must register with the CIHR and then send in an application. The funding decisions will be conveyed by letter as well as publicly posted online.

**b. Pharmacy**

*i. Is Pharmacy for You?*

It’s a common misconception that pharmacists do little more than transfer pills from larger bottles to smaller ones with personalized labels. In reality, pharmacy is an incredibly demanding and patient-centric career that requires both an intensive amount of scientific knowledge and fantastic people skills. Pharmacists are responsible for tailoring a patient’s medications to suit their needs, based on consultations with both the patient and the prescribing physician. Once a plan is worked out, it’s up to the pharmacist to educate the patient about their medication: how much to take, when to take it, if it’s okay to mix different prescriptions, potential health risks and side effects, and a whole host of other information. Since pharmacists fill this vital communicative role, it’s essential that they be well versed in current information regarding the drugs they are providing. With the wealth of new information that becomes available on an almost-daily basis about recently developed drugs or modifications to existing drugs, pharmacy also requires you to be a “lifetime learner” in order to properly educate the public and create effective medication plans for patients.
This is all a lot to ask of just one person, but if you enjoy a great challenge, then pharmacy just might be your niche.

**ii. Laying Your Pre-Pharmacy Pathway**

The entry-level pharmacy degree in Canada is the B.Sc. in Pharmacy. This degree is offered at each of the 9 accredited Pharmacy Schools in Canada, and is required for practising Pharmacy in Canada.

Most B.Sc. in Pharmacy programs in Canada require that applicants have completed at least 30 credits (i.e. a full year) of undergraduate study. Applicants must also have completed a number of required courses, which vary from school to school. In some cases, these required courses will take more than one year of university study to complete.

In general, requirements include one full year of each of the following:

- General chemistry (with lab)
- Organic chemistry (with lab)
- Biology (with lab)
- English (high school level)

Some schools may also require:

- A half/full year of calculus and/or statistics
- A full year of physics (with lab)
- Social sciences or humanities courses (in some cases, must be in specific subjects)
- Courses in microbiology, anatomy, biochemistry, genetics, or physiology

Many Canadian pharmacy schools require applicants to sit the Pharmacy College Admissions Test (PCAT) and submit their scores as part of the application process, or to sit an admissions test designed and administered by the university. Like medical school applicants, individuals applying for a pharmacy program may require letters of reference and may be required to sit for an interview.

For more information about applying to B.Sc. in Pharmacy programs, you can refer to the Pharmacy section on RedBooks (redbooks.sus.mcgill.ca). It is also important to consult the websites of the individual schools to ensure that you are meeting all requirements.

Most Canadian Pharmacy schools also offer graduate programs, such as a M.Sc. or PhD in Pharmacy or Pharmaceutical Sciences. These programs generally accept students with a B.Sc. in Pharmacy or other biomedical sciences (e.g. biochemistry, physiology). Another degree offered by a number of Canadian Pharmacy schools is the PharmD. Canadian PharmD programs should not be confused with their American counterparts; while the American PharmD programs are entry-level, Canadian PharmD programs are considered to be post-graduate and open only to those with a B.Sc. in Pharmacy.

**iii. Certification**

Upon completion of a bachelor’s degree in pharmacy from an accredited university, aspiring pharmacists must complete an examination by the National Pharmacy Examining Board of Canada. They must also complete an apprenticeship or internship for practical experience, as well as meet any requirements laid out by provincial regulatory associations.
iv. Resources

The Canadian Pharmacy Association (www.pharmacists.ca) offers an overview of opportunities in the pharmaceutical industry and a skills and personality profile of a good pharmacist (found under the “About Pharmacy in Canada” tab). There is also a complete list of accredited Canadian pharmacy programs with links to each school, information on the National Pharmacy Examining Board of Canada and charts detailing the requirements of each provincial regulatory authority for in-province, out-of-province or internationally educated pharmacy students.

c. Optometry

i. Is Optometry for You?

During the course of a regular eye examination, optometrists evaluate the eye for physical deformities, determine the cause of any visual impairment, and prescribe appropriate treatments. This can range from simply prescribing glasses or contact lenses to compensate for lens deformities, to medication for glaucoma, to surgery for more serious defects such as cataracts. It is the responsibility of the optometrist to administer any required pre- and post-procedural care for patients referred to a surgical practice. Optometrists also have to watch out for systemic diseases that can initially manifest in the eye, such as hypertension or diabetes.

Most optometrists are engaged in private practice, allowing them to set hours that accommodate both the needs of the patient and the personal needs of the practitioner. Alternative opportunities include research, teaching or health care policy development. If you’re seeking a less-harried lifestyle than the typical physician, but still want to use your scientific knowledge to help people on a day-to-day basis, you might want to look into optometry as a potential career.

ii. Laying Your Pre-Optometry Pathway

There are only two accredited optometry schools in Canada. The University of Waterloo offers English-language instruction, while the Université de Montréal offers a French-language optometry program. Both are four-year programs leading to a Doctor of Optometry (DO) degree, though students admitted to the program at l’Université de Montréal may be required to complete a foundation year. In addition, there are a number of accredited optometry schools in the United States.

Admission to the DO program and University of Waterloo requires a minimum of three years of full-time undergraduate study towards a Bachelor of Science degree. There are also a number of required courses. Students must have an overall GPA of 3.0/4.0 in order to be considered.

The course requirements listed below apply to the University of Waterloo and serve as a general guide. Please refer to school-specific websites for information regarding admissions to programs at l’Université de Montréal or in the United States.

Undergraduate course requirements include one full year of each of the following…

- General biology (with lab)
- Physics (with lab)
- Physiology

…and one semester of each of the following:

- English
- Ethics
The following courses are recommended to enhance your optometry studied. These will not be specifically reviewed by the admissions committee:

- Human anatomy
- Embryology
- Genetics
- Histology
- Immunology
- Linear Algebra or Geometry or Trigonometry

Students wishing to apply must also write the Optometry Admissions Test (OAT) (see http://www.opted.org for more information). The test surveys the applicant’s knowledge of the natural sciences and also has reading comprehension, quantitative reasoning and physics components. The minimum score for consideration is 300; the average score for 2010 applicants was 365.

Applicants must also submit an autobiographical sketch and sit for an interview.

iii. Certification

In order to practice as an optometrist in Canada, you must complete a four-year university program in optometry, accredited by the Accreditation Council on Optometric Education. You must then pass a national examination administered by the Canadian Examiners in Optometry, as well as meet any requirements of the relevant provincial regulatory authority. An extra year of residency training upon completion of the Doctor of Optometry degree is not required for certification, but is becoming an increasingly common practice.

iv. Resources

The Canadian Association of Optometrists (CAO) website has a brief overview of the path to a career in optometry which may serve as a good jumping-off point for your research. The most valuable resource this site provides is a list of accredited optometry programs in the United States that are recognized by Canadian regulatory authorities, with links to each school’s website, so that you have more options than just the University of Waterloo when you’re applying to an optometry program.

The University of Waterloo offers the only accredited English-language optometry program in Canada. Their website has both a comprehensive summary of the process of becoming an optometrist and a detailed breakdown of everything you need to do, academically or otherwise in order to gain entrance to their program. Check it out at http://www.optometry.uwaterloo.ca/.

Si vous préférez d’étudier l’optométrie en français, visitez le site web de l’école d’optométrie de l’Université de Montréal à http://www.opto.umontreal.ca/.
d. Dentistry

i. Is Dentistry for You?

Dentistry is not only about poking around in people’s mouths, prescribing painful orthodontic treatments, and championing flossing and the thrice-daily brushing of teeth. Consider some of the lesser-known duties of a dentist:

- Detection and management of oral conditions: Did you know that dentists are the first line of defence against systemic diseases such as oral cancer or hypertension?
- Restoration and Reconstruction: If you’ve ever chipped a tooth and needed it repaired or replaced, you’d know that it’s a dentist that creates the new and improved version, from moulding it to inserting it in your mouth, so that your smile is as good as new.
- Surgery: No, it’s not limited to pulling out the wisdom teeth of unfortunate teenagers. Dentists also correct facial and dental deformities resulting from accidents or birth defects.

If that piqued your interest but you are unsure if you’re personally suited to be a dentist, here’s some good news: since you’re reading a medical careers guidebook, chances are that you have a high level of aptitude in science and are looking for a career that challenges you and allows you to interact with and help people. These are all key aspects of any good healthcare professional. If you’ve also got excellent manual dexterity and spatial judgment, an interest in being self-employed, or a genuine desire to help people maintain and improve their oral health, you’re already well on your way to a potential career in dentistry.

ii. Laying Your Pre-Dental Pathway

There are 10 accredited dental schools in Canada, each offering 4-year programs leading to either a Doctor of Dental Medicine (DMD) or Doctor of Dental Surgery (DDS) degree. Applicants must typically complete two or three years of undergraduate study and a number of required courses.

In general, requirements for dental school include one full year of each of the following:

- General chemistry (with lab)
- Organic chemistry (with lab)
- Biology (with lab)
- Physics (with lab)
- English

Other required courses may include:

- Statistics
- Biochemistry
- Physiology
- Microbiology
- Social sciences, humanities or foreign language

All accredited dental schools in Canada and the United States require applicants to sit the Dental Aptitude Test (DAT) and submit their scores in order to gain admission. The test has both a written and a practical component and is administered twice-yearly (in November and February) at test centres across Canada. Students may submit Canadian DAT results to accredited schools in the United States, but may not use American Dental Association DAT scores to apply to Canadian schools as the American test lacks a practical component. An interview is also required.
Students should consult the individual program websites for the most accurate and up-to-date information on entrance requirements.

**iii. Certification**

Upon graduation from an accredited dental program or accredited qualifying program, you must pass both the written and practical components of the national licensing examination, administered by the National Dental Examining Board, unless you intend to practice in the province of Quebec. If you plan to attend an out-of-province medical school and then return to practice in your home province, you may also have to apply for a license from your provincial regulatory authority. Once you have completed these steps, you will be certified to practice general dentistry in Canada.

There are nine different certified dental specialties in Canada, each presided over by an individual regulatory agency. Not all dental schools have the requisite training programs for each specialty, so if you’re interested in any of the specialties listed below, it’s best to do some research on which schools offer the appropriate programs.

Dental specialties include:

- Dental Public Health
- Endodontics
- Oral and Maxillofacial Surgery
- Oral Medicine and Oral Pathology
- Orthodontics and Dentofacial Orthopedics
- Paediatric Dentistry
- Periodontics
- Prosthodontics
- Oral and Maxillofacial Radiology

**iv. Resources**

The Canadian Dental Association website is a great first stop on your research journey. Under the tab “The Dental Profession”, they break down the entire process of becoming a dentist into distinct steps, from registering for the DAT to achieving specialty certification. They’ve got all kinds of links to help you get the information you need, such as contact information for Canadian dental schools, national and provincial regulatory authorities, and a list of accredited programs in the United States.

The Commission on Dental Accreditation of Canada (CDAC) website is really designed for institutions seeking accreditation for their dental programs, but reading up on the expectations for institutional programs will give you a good idea of what a dental school might in turn expect from you, particularly if you’re interested in specialization. It’s also got a nifty search feature that allows you to select a specialty and see a list of schools in Canada which offer an accredited program for that specialty, with links to contact information for each school. For more information, visit [www.cda-adc.ca](http://www.cda-adc.ca).

**e. Physical and Occupational Therapy**

**i. Is Physical or Occupational Therapy for You?**

Physical therapy combines an in-depth knowledge of how the body works with hands-on skills to assess, diagnose and treat symptoms of illness, injury or disability. The goal of physical therapy is to restore, maintain, and maximize strength, function and movement. Physical therapists (also known as physiotherapists) prescribe personalized therapeutic services as well as education about the body; what keeps it from moving well, how to restore mobility, and how to avoid and prevent bodily harm.
Occupational therapy differs from physical therapy. An occupational therapist’s goal is to promote a balance between the client’s occupations in self-care, productivity and leisure, in order to increase independent function, enhance development and prevent disability.

ii. Laying your Pre-Physical/Occupational Therapy Pathway

Most universities in Canada have schools of physical and occupational therapy, and an undergraduate degree is required for application. Any bachelor’s degree is sufficient as long as you have met all admission requirements. The general course requirements are listed below. While they are similar for universities across Canada, it is best to check with a school’s specific requirements to ensure you are doing everything you need to. The Canadian Physiotherapy Association website provides links to the admission requirements of many different universities across Canada: www.physiotherapy.ca.

General undergraduate course requirements for Physical and/or Occupational Therapy include one full year of each of the following…
- General or introductory science (biology, chemistry, physics)
- Human physiology

…and one semester of each of the following:
- Psychology
- Anatomy
- Statistics

Some schools may also require:
- one semester to one full year of languages and humanities and/or social sciences
- one semester of English or writing with an essay component

iii. Certification

Graduates of the Physical and Occupational Therapy program may apply to the Canadian Alliance of Physiotherapy Regulators to take the Physiotherapy Competence Examination. Most provinces in Canada require that all licensing applicants pass this examination. This exam requires both written and clinical components.

iv. Resources

The Canadian Physiotherapy Association provides information about the physical therapy field. Check out their website at www.thesehands.ca.

f. Medical and Health Administration

i. Is Medical and Health Administration for You?

A career in medical and/or health administration allows you to take on a career in a wide variety of healthcare settings without spending years in the classroom. A medical administrator provides administrative support and credentialing services to physicians and other health care professionals to help them focus solely on patient care. The administrative training familiarizes you with medical transcription and office procedures. You will learn to understand a variety of medical tests and procedures as well as how to use software commonly used within medical offices. At many schools, Medical and Health Administration is offered as a diploma program. However, at some schools like the University of Ottawa, students can earn a degree in Medical and Health Administration through the faculty of management.
ii. Laying Your Pre-Medical Administration Pathway

There are few requirements for this program, mostly focused on Secondary School courses. However, the more education you have (whether a year or two of university or even a degree), the more prepared you will be for the program.

General admission requirements include:

- Secondary school diploma with Grade 12 English
- Grade 12 Mathematics is strongly recommended

Though there are few admission requirements, Medical and Health Administration programs are looking for students with the following skills:

- Eye for detail and ability to edit carefully
- Excellent writing and research skills
- Interest in medicine
- Good customer service and excellent organizational skills
- Computer skills

iii. Certification

Many programs offer a two-week placement in a health-care facility in your final semester to give you an opportunity to practice your new skills and make important contacts. After receiving your degree or diploma, you will be ready to enter the workforce. Medical office administration professionals are in high demand; with advances in technology and an aging population, medical care and administration will always be needed.

g. Epidemiology and Biostatistics

i. Are Epidemiology and Biostatistics for You?

Epidemiology is the study of the transmission and control of disease. There are two main types of epidemiology: population epidemiology and clinical epidemiology. Population epidemiology is the study of the distribution and determinants of disease in the population. This study can lead to new foci in health promotion and illness prevention. A good aptitude for quantitative statistical methods is required to be successful in this field. Clinical epidemiology applies epidemiological methods and some bio-statistical methods to research in health care practices. It can influence health care practice as well as illness treatment.

ii. Laying Your Pre-Epidemiology Pathway

Epidemiology and Biostatistics is offered as a Graduate program in many universities across Canada. Applicants to an M.Sc. or MPH (Masters of Public Health) degree must hold a Bachelor’s degree in basic or applied science, or a Bachelor’s degree in any other field with demonstrated quantitative abilities, from an accredited institution with a minimum A- (80%) average. For a PhD program, a thesis-based Master’s degree is required.

Most schools require students to have completed a course in statistics. Applicants must also:

- Demonstrate a good academic performance in previous studies as shown by official transcripts, research reports, abstracts or any other documents demonstrating research skills
- Provide a statement of purpose demonstrating ability to write reports, and indicating the career goals and the interests in the proposed research area
- Possess competence in a defined list of statistical topics

Beginning in Fall 2011, McGill will also be offering a Master’s of Public Health (MPH) degree. Visit the Department’s website at http://www.mcgill.ca/epi-biostat-occh/ for more information about this new program.

iii. Resources

The Public Health Agency of Canada provides a comprehensive list of graduate programs in public health, including those for epidemiology and biostatistics. To find out more information, check out http://www.phac-aspc.gc.ca/php-psp/master_of_php-eng.php.

The World Health Organization (WHO) website provides a section dedicated to epidemiology and how it is contributing to society. There are many links to descriptions of activities, reports, news and events, as well as contacts in various WHO programmes and offices working on this topic. To learn more, check out: http://www.who.int/topics/epidemiology/en/.

Did You Know?
There are many other careers out there for someone who’s interested in medicine. If you need help getting started on your search, or simply need help navigating your way through all the different possibilities, drop by McGill’s Career Planning Service.
Resources for McGill Students

As a McGill student, you have a multitude of resources available to you – if you know where to look. The following is a brief guide to the various services on campus that can help you achieve your medical dreams.

**Medical Direction (MD)** is an initiative of the Science Undergraduate Society (SUS) that aims to enhance the medical experience of interested students. MD provides opportunities to shadow doctors and professionals in health-related fields in their working environments; MD also invites speakers, hosts information events, and produces publications such as this one. In February 2009, MD organized a humanitarian trip through Global Medical Training (GMT) to Panama City, where McGill students had the opportunity to observe doctors in action and assist in basic patient care. In time, MD hopes to expand its services to provide insight to a variety of different careers. You can learn more about Medical Direction on our website, [http://md.sus.mcgill.ca](http://md.sus.mcgill.ca), or on our Facebook group.

**MedCasts** was started in the fall of 2009. Every year, the MedCasts team creates informative interviews questioning the current health care system, the medical school application process, medical ethics, and more. Among those interviewed are Saleem Razack, the Assistant Dean of Admissions of McGill Medical School, and Dr. Margaret Sommerville, the Samuel Gale Professor of Law, and the Founding Director of the Faculty of Law’s Centre for Medicine, Ethics, and Law at McGill. Visit [http://md.sus.mcgill.ca/medcasts/](http://md.sus.mcgill.ca/medcasts/) to hear the interviews.

**SUS Peer Tutoring** is a terrific resource for students. If you need help with course work, sign up to receive free tutoring from a fellow student who has previously received an A- or higher in the course. If you want volunteer experience, you can become a peer tutor in a course you aced – in addition to being a rewarding experience, you will receive a letter of reference from the dean stating the number of hours you contributed.

**RedBooks** is a free online resource guide, designed to provide information regarding entrance requirements for a variety of graduate and professional programs in Canada and abroad. With pages for over 400 programs, RedBooks is a detailed and useful resource for anyone considering future studies. RedBooks is run and maintained by a group of dedicated McGill students. Visit [redbooks.sus.mcgill.ca](http://redbooks.sus.mcgill.ca).

Throughout the year, the SUS and other McGill organizations offer **seminars** and **information sessions** open to students and faculty. Here, students can learn about the latest research, events, and publications relevant to medicine. McGill also hosts **career fairs** for students, as well as **charity events** and **volunteer and leadership opportunities**.

McGill’s SUS has partnerships with **Kaplan, The Princeton Review, and Prep101**. McGill students can benefit from the following partnership discounts: a $100 discount on any Kaplan classroom course or private tutoring package (MCAT, LSAT, GMAT, GRE, DAT, etc.); a $200 discount on any Princeton Review classroom course or private tutoring package (MCAT, LSAT, GMAT, GRE, DAT, etc.); and a $200 discount on the Prep101 comprehensive MCAT course and/or a $10 discount on any Prep101 undergraduate class prep course. Several times during the year, the SUS auctions MCAT courses that have been donated by these companies, with proceeds going to charity. For more information about discounts, visit [www.susmcgill.com](http://www.susmcgill.com).

**Career Planning Service (CaPS)**, is a service funded by student-service fees available for students of all faculties, both full and part-time. It is an excellent resource for all things career-related, from building a CV and developing networking skills to finding the career that is right for you.
Throughout the year, CaPS offers a multitude of workshops for undergraduate students. Topics include:

- Alternative Careers in Life Sciences
- Cover Letter Practice Session
- CV Writing
- Grad School Personal Statements
- Interview Techniques
- Medical School Interviewing (including practice MMI sessions)

The CaPS Resource Centre is a wonderful source of print and electronic information. The Resource Centre carries numerous books on Medical School Admissions and medical careers in general. Useful information can also be found on the CaPS website, such as Podcast and Print versions of popular workshops.

CaPS also offers counselling from talented Career Advisors. Advisors can be seen during drop-in hours or by appointment. You can come to them with any questions you may have regarding your career plan, or lack thereof. You can inquire about summer jobs and how to get involved with research. You can even have an Advisor go over your personal statement for graduate/medical school or to help you out with your interview skills. To make the most of your time with an advisor, make sure to prepare questions in advance and check out other CaPS resources. CV advising is also available on a drop-in basis during the year. CaPS can get pretty busy between January and March, so it’s good to plan ahead and get down to CaPS as early as possible.

For those who aren’t certain about a medical career, the Program for the Advancement of Career Exploration (PACE) is a great way to learn about other options. This series of four workshops helps to identify your skills and interest and match them to potential vocations.

CaPS also provides a Mentor Program in which undergraduate students are paired with McGill Alumni and staff from a variety of fields and industries. A mentor is a source of advice and insight into life after graduation and possible careers. Generally, there are not many healthcare professionals available as mentors, but the number and type of mentors available is continually changing. Even if you can’t get a mentor in the exact field you are interested in, the program can help to expose you to different possibilities.

Check your inbox every month for CaPSScoop – the CaPS newsletter and primary publication. It provides information about upcoming CaPS events along with useful career advice. You can also search and sign up for upcoming events and workshops on the MyFuture tool on the CaPS website.

It’s never too early to start planning for the future. Visit CaPS in the Brown Student Services Building, Room 2200, and check out their website at http://www.mcgill.ca/caps/.
About Medical Direction

Medical Direction (MD) is the official pre-medical society of McGill University, supported by the Science Undergraduate Society (SUS). Our aim is to enhance the experiences of students interested in a career in medicine so that they can make an informed and educated decision.

MD offers a shadowing program with health care professionals and current medical students, informative speaker events, academic seminars, volunteer activities, and various social networking opportunities, such as the annual Wine and Cheese.

MD also medical humanitarian trips in partnership with the international NGO, Global Medical Training (GMT). Trips to Panama, Dominican Republic, Ecuador, Peru, and beyond provide students with hands-on medical experience, teaching them how to take blood pressure, check vitals, and diagnose basic diseases in rural communities.

Overall, with Medical Direction, we hope to broaden all students' horizons, and allow them to get a taste of the real world before they finish their undergraduate degrees.

For questions, comments or more information, please contact us at:
http://md.sus.mcgill.ca
medicaldirection@gmail.com
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