Research as a University of Manitoba medical student: a crash course

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Abstract

"Do you have research experience?", "What are your plans for the summer?", and *"How important is research?"*. These are questions which many 1st and 2nd year medical students may come across. Already, medical students have a strong interest in research. A 2014 Canadian survey polled students at the Michael G. DeGroote School of Medicine, and discovered that 89% of students had previous research experience.[1] While student research participation may vary from school to school, perceived barriers to student involvement in research persist. These often include a lack of time, unfamiliarity with the research process and absence of knowledge related to seeking research opportunities.[2] This commentary will discuss what research in pre-clerkship can look like, tips on the research process, the importance of research for medical students, and how to boost student involvement in research.

Keywords: medical student, research, Manitoba

Why is research in medical school important?

Exposure to research during medical school can provide numerous benefits. Students can gain an appreciation for a medical specialty by learning about future directions or important issues within a field, and/or seeing what work is being conducted "behind the scenes" to improve patient outcomes. Students can also gain firsthand insight into how physicians coordinate ongoing research projects in addition to, or in parallel with, their own clinical practice (for information on typical research involvement for given specialties, see the *Canadian Specialty Profiles* compiled by the CMA).[3] Research also allows students to build connections within a research team and its network of academic researchers, clinician-scientists, and clinicians.

In addition to exposure benefits, taking part in research projects allows one to develop specific skills that will be broadly generalizable within medicine. For example, skills learned in clinical research, such as performing statistical analyses on data sets, provides the student with knowledge on data manipulation. This knowledge can be used for one's own future research projects, and (possibly more importantly) provides the student with an understanding of how to critically appraise statistical analyses performed in other studies. Furthermore, skills such as chairing lab meetings and giving presentations can be used not only in other research projects, but outside of research as well. Research experience also furthers skills in multitasking, communication, and scholarly writing.[4] These, along with the many other skills developed in research, can be used between different specialties, within and outside of research, and for the rest of one's career.

As future physicians, it is important for medical students to be think critically, and to be able to keep up with the dynamic field of medical research.[5] Research experience is one excellent way to develop these broad analytical skills. A recent survey asked medical, veterinary, and dental students in Britain what key skills and attributes they considered to be important for a professional career. Results from the survey demonstrated that students valued having critical appraisal skills and an inquisitive mind, skills which they felt they developed more by completing their final research project, rather than the degree programs themselves.[6] Such skills help students understand the results of relevant diagnostic, prognostic, and treatment trials, as well as how to apply these findings to clinical problems.[5]

Research may also contribute to medical students successfully matching to their desired residency programs. This is because many residency programs place at least some emphasis on prior research experience, or involvement in scholarly activities, which may or may not result in a peer-reviewed publication.[7] The Scholarly Activities and Research Experience section of the Canadian Residency Matching System (CaRMS) residency application states *"This section is for recording scholarly activities and research experiences, which may include* ***paid or unpaid work****. For the purposes of this application, scholarly activities are defined as op-*

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portunities to participate in ***research****, organized* ***clinical discussions, rounds, journal clubs****, and* ***conferences****. The research experiences you list here* ***do not have to be published works****, simply research in which you were an active participant."* [7] Thus, participation in extracurricular scholarly activities, regardless of whether it is strictly published material or not, can be included on an application and may benefit the student.

Lastly, research further provides students with mentorship opportunities which enable knowledge-sharing on various topics. Clinician-scientists can provide students with insight into medical school, residency applications, and establishing a career suited to their interests. [8] Furthermore, early-formed, long-standing relationships could facilitate reference-letter requests in the future. [8] Establishing rapport with a clinician can allow him/her to write a more personalized letter attesting to the student's traits and skill set. [8]

How to get involved

The Max Rady College of Medicine offers pre-clerkship students a number of formal research opportunities. [9] Options include the BSc(Med) program (in which students conduct a research project over two summers following first- and second-year medical school), the MED Summer Research program (similar to BSc(Med) but conducted over one summer only), as well as the MD/MSc and MD/PhD programs, which require that medical students take 1-4 years away from medical training to complete their graduate degree. Each of these programs provide students with stipends of varying amount, along with strong administrative support and guidance. Further details information on these program, including frequently asked questions, and contact information, can be found on the College's Graduate and Advanced Degree Education in Medicine webpage. [9] Students may also conduct research through the Standing Committee on Research Exchange (SCORE) international exchange program through a partnership between the Canadian Federation of Medical Students and the International Federation of Medical Students. Applications are completed in the fall for exchange occurring the following summer. More information can be found on the program's website. [10]

While research experience can be obtained through university-sanctioned programs, research opportunities are by no means limited to these programs. Other university faculty, hospital staff, and resident physicians are often open to student participation on their projects. Students can discuss their interest in research while shadowing a physician, or can simply raise the topic with physicians they already know. Anecdotally, it can be quite easy to get involved with projects that require less of a time commitment than, for example, a two-summer full-time BSc(Med) project. These projects can still provide an environment to build connections with physicians, learn about a medical field, and hone practical skills students can use in future projects.

Tips (adapted from Young *et al*) [4]

- Find a mentor that is interested in working with students and has (preferably) done so before
- Before getting started with a project, conduct a literature review on the topic to come up with new ideas, or do readings (e.g. textbooks, online resources) to establish a knowledge base
- Before committing to a project, discuss with the researcher how you will be acknowledged for your contribution and what your goals are. You may want to ask about time commitment, if the researcher plans on publishing the project, the predicted timeline for publication (i.e. will the project be published before residency application deadlines?), and if the researcher is open to including students as co-authors.
- Set deadlines – both for yourself and in coordination with your mentor/supervisor
- Start small! Smaller projects are more manageable and have a greater likelihood of being finished
- Ask around! Take initiative, be a "trailblazer", and find projects that interest you and suit your abilities and schedule. Some University of Manitoba residency programs even list resident contact information on the residency program information webpage.

Conclusion

Research can benefit medical students by providing experiences which can be useful for future residency applications, allow for mentorship opportunities, and enable the development of critical thinking skills which could be utilized as future clinician and researcher. The Max Rady College of Medicine offers organized programs for involvement in research at undergraduate level, but students should also be open to reaching out to healthcare professionals to initiate, or get involved with active, research projects. The privilege of contributing to medical advancement, the skills and experiences gained, and the connections built, mean medical student involvement in research is likely quite beneficial to the general education of an undergraduate medical student.

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