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So, you've finished your first research project ... now what?

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ILLUSTRATIVE CASE

After completing a research project exploring whether the introduction of a computer-based reminder system actually increased the provision of selected preventive services in a General Internal Medicine ambulatory clinic, a third-year Internal Medicine resident considers what, if any, further research experiences she should pursue during the remainder of her residency training. She also wonders whether it would be possible to pursue clinical research as a component of her career after the completion of specialty training and, if so, what additional research training she might require.

■ **So, you've just completed your first** health sciences research project. Now what? Including research activities as one component of your career as a health professional is an excellent way to keep your interests diversified, to contribute to knowledge generation in your field and, perhaps most importantly, to engage in a wide range of collaborations on interesting issues relevant to your practice. Many health professionals finish their training with a desire to acquire clinical mastery and to be a researcher, but feel that it is impossible to combine these two paths, especially in view of the time involved not only in conducting research but also in acquiring the methodological expertise necessary to do so. Balancing multiple competing obligations is a recognized difficulty in the transition from supervised to independent practice. This chapter makes the case that all health professionals should play some role in research in their field, and that it is possible to participate in research at different levels, and at any point in one's career.

Few descriptions of **medical research careers** account for the wide range of projects that a health professional can become involved with, or the various degrees of involvement that are possible. Each type of engagement entails a different level of skill development (which can include study design, statistics, research ethics, database construction and management, and manuscript and grant writing), time commitment, responsibilities and rewards. The following sections describe six variants of research involvement.

CHAPTER OBJECTIVES

After reading this chapter, you should be able to:

- discuss various paths to further involvement in research after the completion of your first research project
- describe the merits of including research activities as a component of your professional career

KEY TERMS

Co-investigator	Mentor
Collaborator	Principal investigator
Critical appraisal skills	Recruiter
Medical research careers	

The critical consumer

Although you might not wish to be an actively participating researcher, all health professionals should, at a minimum, become and remain critical consumers of the published literature relevant to their practice. Completing a research project gives you an appreciation of the challenges inherent in bringing a health research project through all of its stages: from the initial idea to the formulation of a clear research question, to the marshalling of a research team, the creation of data collection instruments, the collection, analysis and interpretation of data, and their synthesis into a completed project report, presentation and perhaps a peer-reviewed publication. Having first-hand experience of these steps and of the ways in which a project can run into difficulties gives you a practical understanding of the research process that can help you to read between the lines of published studies. This insight will undoubtedly complement the **critical appraisal skills** you will need to be a capable, critical consumer of the health care literature, and will enhance your appreciation of unbiased and rigorous research results. This level of engagement involves keeping up with the literature and maintaining critical appraisal skills. Participating in a journal club that rewards participation with continuing professional development credits is an excellent way to facilitate this. If such a club does not exist where you practise, create one!

The recruiter

A second way in which you can become involved in research is as a **recruiter**. In this role you are plugged into clinical trials networks or other structures for ongoing health research to see whether patients in your practice would be eligible for enrolment in an appropriate study. Although recruiters are not major players on the research team, it is clear that, without the broad-based support of these front-line practitioners, clinical trials would never attain the sample sizes they need to obtain meaningful results. Identifying and referring potential participants to applicable clinical trials and other health research studies can be rewarding: it links you to research projects through frequent communications from the principal investigator and the study team and through access to preliminary research results. This level of involvement also provides insight into the research process, including any challenges leading up to the synthesis of the research results; can help you to forge links with active researchers; and, can alert

you to advances in the field before they are more broadly known. No further research training is required for this type of involvement, and study co-ordinators and hired research assistants tend to provide support for recruiters with regard to study procedures.

The occasional collaborator

The third way to be engaged in health research is as an occasional **collaborator**. This would mean that you are not actively involved with health research projects at all times, but occasionally collaborate actively in projects that come to your attention and are related to your area of practice. Being an occasional collaborator can include the opportunity to be a coauthor of published results. The best place to formulate important new questions is in the front lines of health care: questions arise every day in clinical practice that might be answered by a structured research project. Being an occasional collaborator might lead you to the next level of research engagement, which is that of a research collaborator with a mentor.

The research collaborator with a mentor

Chapter 5 of this guide stresses the importance of finding a research **mentor**. If you want to become more engaged in research, you will need—at least in the early part of your research career, whether in the community or in close association with an academic health sciences centre—a mentor to foster the growth of your methodological skills and to open up opportunities for you to gain research experience. It often helps to start as a collaborator on a project under the supervision and guidance of a more experienced researcher. This way, you can learn where your methodological strengths and weaknesses lie and figure out how best to tailor your interests to the range of possible studies and principal investigators available. Although it is to your advantage to find a mentor who is an experienced and accomplished investigator, it is equally important for this person to have a genuine interest in helping you—and the time to do so. At this stage of engagement you might wish to acquire more advanced research skills. Part- or even full-time study in a graduate program, or in short courses, weekend or summer courses, or online courses can enhance your methodological and analytical skills. In addition, specialized health research training programs are available

through the Royal College of Physicians and Surgeon of Canada's Clinical Investigator Program¹ and the College of Family Physicians of Canada's Clinical Scholars Program.² As a collaborator, you should also become engaged in the process of writing and submitting manuscripts for publication in peer-reviewed journals.

The co-investigator

The next level of research engagement is that of **co-investigator**. Co-investigators are an important component of a multiprofessional or interdisciplinary research team and assume substantial responsibility for the execution and oversight of the project. They help with formulating the research question, writing the protocol, and building, structuring and supervising the research team, and typically bring a fairly high level of expertise to the project. Additionally, co-investigators should play a role in the dissemination of results, including by co-authoring manuscripts, preparing abstracts and posters, and presenting results at conferences. Most researchers make the step to co-investigator after having been a mentored collaborator for some time, and typically first serve as a co-investigator with their research mentor. Attaining this level of engagement usually involves formal graduate training in research methodology.

The principal investigator

Finally, in the role of **principal investigator**, you are in charge of the whole show. You take the lead in formulating the research question, recruiting the research team, and writing the protocol and grant application. You shepherd the project through the ethics review process, take charge of the recruitment and supervision of the support staff, and mentor and lead the research team. I have found being a principal investigator to be among the most rewarding roles of my professional life. The opportunity to work with collaborators and co-investigators from a wide range of professions and disciplines on health-related questions is continually refreshing and challenging. One learns not only new methods but is in contact with talented graduate students who push one's understanding and knowledge and ask questions that frequently expose flaws in one's own reasoning or room for development in one's own skills.

The rewards of a research career

Why do research? What does it bring to a health professional's career? The rewards are numerous, as the following reflections show.

- The knowledge that informs health practice is best created when practising health professionals have the opportunity to ask questions and look for solutions that aim to provide better health care for future generations of patients and populations, or to develop diagnostic and prognostic tools that help us to better inform our patients about their situation.
- Research is endlessly challenging. One must frequently overcome obstacles that were not foreseen in the protocol phase. This requires patience and ingenuity. I have often referred to grant writing as a form of creative non-fiction in which one must project one or more years into the future things that one wishes to see happen, even though the world in which one does research is not necessarily aligned with those goals. Indeed, perhaps one of the best reasons to persevere with a research career is to see the multiplicity of ways in which the real world can thwart the most beautifully created protocol. This may be frustrating to some, but with a little humour you can come to appreciate these unexpected turns as one of the more fascinating aspects of research.
- A research career permits you to meet, work with and learn from many interesting, bright and engaging colleagues, including graduate students, research coordinators, research associates, not to mention the patients recruited into your studies. I have learned a great deal from the participants in our studies and recently added patients to our Research Advisory Committee: they bring a perspective that is often overlooked in the planning and conduct of study protocols. In addition, research provides opportunities to meet and interact with other researchers by attending and giving presentations at local, national and international meetings.
- Research also offers some more direct personal rewards. It still gives me great pleasure to see a letter of acceptance from a peer-reviewed journal or a letter of congratulations from a funder. These are by no means taken for granted. People who do not engage in research as part of their professional life do not see the immense amount of work it takes to get from a

grant proposal to a peer-reviewed publication. It truly is an accomplishment worth celebrating. Even if most of the world ignores your paper, family members are bound to be pleased to receive a copy of a paper with your name listed among the authors. And— more seriously—publishing in the peer-reviewed literature establishes your credibility and may lead to invitations as a peer reviewer or to participate on expert advisory boards locally and internationally.

- Last but by no means least, your research may contribute to the development of best practices and the improvement of patient outcomes.

Conclusion

There are many paths to engagement in the research process. Increasingly, the more I do research the more I think it should be integral part to every health professional's activities. In this chapter I have tried to point to some of the ways in which health professionals can integrate research into their day-to-day practice. I hope all readers who are in the midst of or have already completed their health training will find ways to become involved in research in some way in their professional lives. ■

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- This paper highlights the development of clinical research career paths in the United States and outlines current trends.

SUMMARY CHECKLIST

- Thinking about your experiences with research and your career interests, describe the role you would like research to play in your career. Describe how you expect this to change over time.
- Develop your strategy for a successful role in research, as outlined above. Be sure to list:
 - experience you wish to have
 - training you wish to obtain
 - mentors you would like to work with
 - levels of involvement in proposed studies

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