



## Publishing clinical research: ten pearls for oncology trainees and junior oncologists

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The old adage of “publish or perish” bears some truth. As the lines between “academic” and “community” practice blur, more physicians are expected to participate in “scholarly activities.” Such activities will be required regardless of career path in clinical care, education, research, or administration. A successful research project can set oncology hopefuls apart from other applicants and can drive conversations at interviews. Research can also provide opportunities to attend conferences, where networking with other researchers is critical to one’s work and general career development. For oncologists, peer-reviewed publications are an objective indicator of productivity, an important component of annual assessments, and an integral component of university promotion processes.

Although research is not for everyone, seeing a project through to peer-reviewed publication carries great merit because of the effort and persistence it requires. Previous publications have outlined how to conduct research<sup>1,2</sup> and the importance of having a good mentor<sup>3-6</sup>. We hope that the present article, with its 10 pragmatic tips, will help junior researchers ultimately to publish their work. Although not every point is supported by a peer-reviewed publication (or at times by specific evidence), our tips are derived from conversations with other researchers and from our own experiences with editing, publishing, and (we must admit) countless rejections. As authors, we reflect all stages of training—university graduate (SM), resident (MF), research fellow (CJ), junior faculty (AA), and old-timer (MC)—and we hope that the “pearls,” while not telling the whole story, will at least provoke lively debate.

### Choose the Right Project at the Right Time in Your Career

Choosing the right project is crucial. You must consider how much time you have available and the impact that you hope the project will have. Too often, a researcher tackles a project with great enthusiasm, but as the work goes on (frequently so long that the trainee has moved

on to other rotations), energy is sapped. By the time the project finishes, the researcher is disappointed and frustrated. Common examples are case reports and retrospective chart reviews—projects that are commonly pursued by junior trainees and junior faculty. Although such projects can require little planning and relatively less time than must be devoted to larger undertakings, I (MC) find that they often require a disproportionate amount of time and energy relative to their research merit. Unless a case report is truly novel, it should generally be avoided. Chart reviews also take longer than anticipated and are limited by a relatively small sample size. Like case reports, they are not often published in high-quality journals. There are two scenarios in which such projects can be fruitful pursuits. First, when the data are already collected, available electronically, and easy to abstract. Second, when a small sample is collected for the purpose of piloting a larger and more formal study. If the data are of sufficient interest, the results can be used to establish collaborative research with a larger group that might have their own prospectively collected data. Those more robust data can then be used as part of grant submissions and, hopefully, a prospective study.

Acting as senior investigator on a randomized phase III trial might be considered an ultimate way of having research affect patient care, but we are living in a time of increasing fiscal constraint, and with the amalgamation of collaborative groups, the opportunities for leadership roles will likely decrease<sup>7</sup>. Our advice would be to gain recognition by entering patients to ongoing trials while also realizing that many other highly important types of research that can significantly improve patient care are open to you (Table 1). Junior investigators are often caught between spending time gaining clinical expertise and performing research. One way to deal with the duality is to connect clinical duties with a research project. You can ensure that your clinical work informs the research project: that is, see patients who have the disease you are studying, or enter patients of a specific population into your trial. Although it might appear that most

TABLE 1 Research project impact and requirements

<i>Project type</i>	<i>Likelihood of</i>		<i>Time commitment</i>	<i>Requirements</i>	<i>When it might be worth it</i>
	<i>Publication</i>	<i>High-impact publication</i>			
Case report	Low	Low	High	Consult journal of interest	Truly novel case with a striking image
Chart review	Low to moderate	Low	High	Use STROBE ( <a href="http://www.strobe-statement.org">http://www.strobe-statement.org</a> )	Keep it small and use data for planning collaboration
Administrative database study <sup>a</sup>	Moderate to high	Variable	Low	Use STROBE	Always
Commentary	Variable	Low	Low	Consult journal of interest before starting	Invited or pre-publication commitment commentary
Invited review	High	Low to modest	Medium	A senior investigator might be approached directly by a journal	Early in your career
Systematic review	Moderate to high	Variable	High	Use PRISMA ( <a href="http://www.prisma-statement.org">http://www.prisma-statement.org</a> )	With an innovative question to explore
Basic science	Moderate	Low	High	Ensure that you are working with a group that has published before	During a master's or doctorate
Clinical trial	High	Moderate to high	Variable	Use CONSORT ( <a href="http://www.consort-statement.org">http://www.consort-statement.org</a> )	Always, depending on level of involvement

<sup>a</sup> See, for instance, the Institute for Clinical Evaluative Sciences (<http://www.ices.on.ca>).

Young Investigator awards at the American Society of Clinical Oncology are made for basic science work, research in oncology can cover a vast range of topics (Figure 1).

### Be Smart with Your Time

Many junior researchers might think that one project is enough to fill their time, but working smart can often allow an individual to have several projects on the go at once. Such multitasking is best when a common theme links the projects such that many aspects overlap<sup>8</sup>. For example, our group has an interest in de-escalation of bone-targeted therapies for patients with metastatic bone disease. We staggered our work into short-term projects (commentaries<sup>9</sup>, editorials, pilot chart review<sup>10</sup>, review articles), medium-term projects (surveys of patients and physicians to demonstrate clinical equipoise<sup>11</sup>, systematic reviews<sup>12</sup>), and longer-term projects (creation of pilot single-arm and randomized feasibility data studies<sup>13,14</sup>). Deadlines are thus spread out and the payoffs are layered—all hopefully one day leading to funding for a larger phase III trial.

### Find a Good Mentor

Whether you are a student, trainee, research fellow, or junior faculty, having a good mentor provides many benefits. Mentorships during the early stages of one's career are associated with greater career satisfaction,

networking within the field, and promotion<sup>3,15–17</sup>. It is important to find a mentor who can contribute to your professional growth and development and who does not promote a personal agenda over those of mentees with the intention of generating “academic clones”<sup>18</sup>. A good research mentor can provide useful advice early in a research project and can assist in refining the scope and research question<sup>3,19</sup>. Depending on seniority and research productivity, your mentors might also invite you to co-author invited articles for publication.

If you are looking for a research supervisor, check PubMed first. Has the person published recently? Does she or he publish often? If the answer to both those questions is no, keep searching. Corollary, an individual who publishes often will not necessarily be a good supervisor. The best way to tell whether the person will be a good supervisor is to contact past research students; they can provide valuable insider information about whether the mentor would be right for you. One further (crude) litmus test of a good supervisor is their response time to e-mail messages. In our experience, the quality of a supervisor and that person's response time to messages are inversely related. Lack of time to respond suggests that the person probably doesn't have time to be a good supervisor.

### Develop a Good Research Question and Then Reject It for a Better One

The importance of a great research question cannot be understated. Generating a research question is an

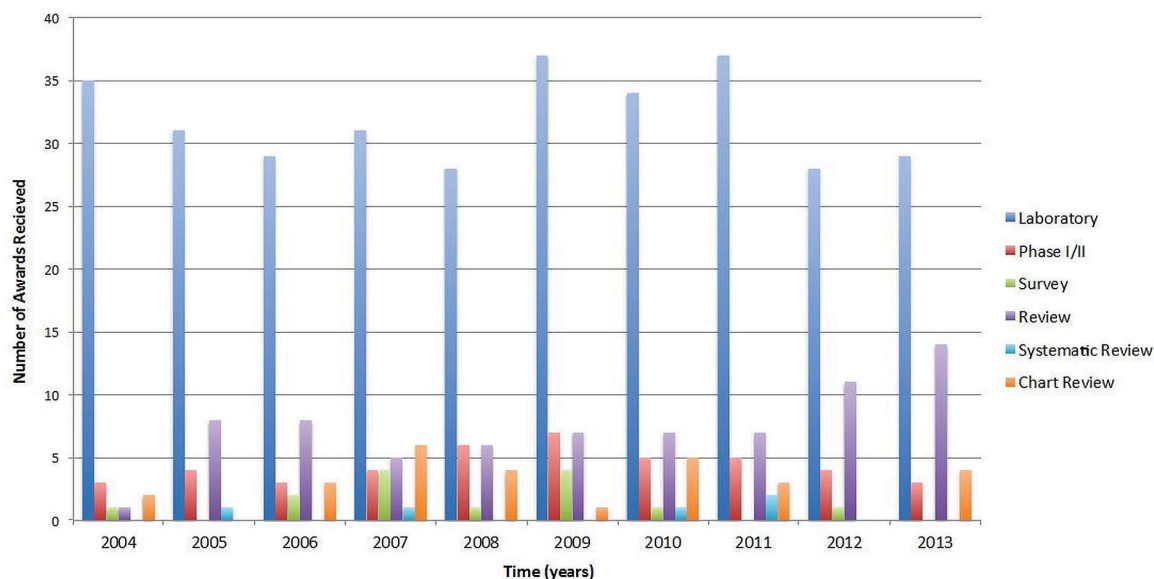


FIGURE 1 American Society of Clinical Oncology junior investigator award recipients, 2004–2013.

art that takes years to master. In considering your research question, you should envision the headline your question will generate once answered. If that headline doesn't interest you or your peers, it probably won't interest journal editors either.

In my experience (CJ), areas of uncertainty and controversy in clinical practice are often a good source of research questions. For example, why do some clinicians use antibiotic prophylaxis against febrile neutropenia in the oncology clinic, while others use colony stimulating factors? Despite guidelines to support both practices, head-to-head trials comparing those approaches are lacking. Numerous other clinical quandaries need similar investigation.

One useful way to evaluate a research question is to apply the PICO mnemonic<sup>20</sup>. A clinical question should have four components: population (P), intervention (I), comparator or control (C), and outcome (O). The research question should be concise (that is, try to answer just one question) and answerable (that is, the data exist and are attainable). Do not be afraid to seek feedback on preliminary research questions from trusted colleagues and mentors. In our experience, rejection of ten or more preliminary research questions is needed before the right question is selected. One previous supervisor likened the evaluation of a research question to the sport of baseball. It turned out that my (MF's) first ten ideas were fly balls or strikeouts. With time, I generated a few singles, one double, and then, finally, a triple. I'm still waiting for my home-run idea.

### At Least One Third of the Time Spent on a Research Project Should Be Spent on Planning

The planning phase of a research project is often the least exciting part, but it is vital to a successful

project<sup>6</sup>. After a research question is selected, the next crucial step is completing a thorough literature review. Start by finding a review article that outlines areas of the topic that have already been studied and areas for future research. Speak to your hospital's librarian about generating a literature review. Librarians are experts at generating research questions and selecting the appropriate medical subject headings for keyword searches. Once an initial literature review is complete, review the bibliographies of useful articles to find additional resources. If the planning phase of your project seems too demanding, you really have to ask yourself if this project is for you.

### Make Sure That the Team Is Right

In our experience, a broad range of team members can add exponentially to the quality of the project. The value of bringing on board a methodologist or biostatistician (of all potential collaborators) cannot be underestimated: their involvement can help to avoid many common pitfalls. Schedule regular team meetings to ensure that the project is progressing and that the responsibilities of team members are being fulfilled. Regularly develop and update clear timelines and deadlines. Try to attend scientific meetings as a team if possible; group attendance not only can ensure greater collaboration and relationship-building, but can also provide an opportunity to grow new research ideas together.

A challenge associated with a large team is the potential for long-term conflict, such as that concerning authorship<sup>3</sup>. It could be tempting to include as many authors as possible, but the rules from the International Committee of Medical Journal Editors on publication are readily available, and honorary authorship is to be avoided<sup>21</sup>. Allocation of authorship

can be challenging, especially for a more junior investigator. In our experience, the more authors involved, the less work many do, and it is indeed sometimes hard to know if some of them even read the final manuscript. Such contributors often better qualify for an acknowledgment—an understanding that has to be established early in the project.

### The Ethics Board: Friend or Foe?

For any seasoned investigator, regulatory issues are a major challenge. If you plan to publish a study that uses information from patients (a chart review, for instance) or from physicians (perhaps a survey), many centres will require that you obtain approval from an ethics board. Dealing with the ethics board might seem like a nuisance, but it plays an important role in maximizing regulatory compliance from investigators. Sometimes a telephone call to an ethics committee chair member can obtain answers to many questions before a project proposal is submitted. Researchers should consider serving on their local ethics board or at least sitting in on review meetings. The invaluable insights obtained about how the regulatory process works can help down the road when submitting projects.

### Writing Your Manuscript: It Is Never Too Early to Start

When writing the initial drafts of a manuscript, ensure that all members of the team contribute to the process. Prepare the abstract first to convey a reflective summary of the research. If you cannot write a clear abstract about your project, then it is unlikely you can write a clear manuscript. Using a reference manager program to import references from online databases can help with organizing references and creating the correct bibliographic style. When writing, remember to keep the text simple, clear, and to the point. The key to a successful manuscript is to tell a story! Some authors find ease in following templates for certain sections of the manuscript<sup>22,23</sup>. Once you have a full draft, ask a colleague who is not involved with the project to read through it; you will be surprised at how many glaring errors you will have made.

The next question is which journal to submit to. To begin, consider sending an e-mail message to the desired journal to gauge their level of interest in your project. Associate editors can provide invaluable and timely e-mail feedback that might otherwise take months via peer review, with exactly the same outcome: “reject.” Be sure to tailor your manuscript to the target journal. While editing for the *Canadian Medical Association Journal*, I (MF) will never forget the day I read a submission whose cover letter was addressed to an entirely different journal. No matter how good the study was, it was difficult mentally getting past the clear blunder those authors committed.

### Dealing with the Three R's: Rejection, Revision, and Resubmission

It is important to understand the review process. If months have passed since your manuscript was submitted, you might want to send an e-mail message to the journal inquiring about the current status of your work. Although rejection is discouraging, it is part of the publication process. Feedback is meant to be constructive; it provides valuable suggestions for improving the manuscript. Address the comments the reviewers make, but do so concisely and clearly in a logical, polite, and point-by-point manner. There is no better way to frustrate a reviewer than to compose a verbose response that does not actually address the original comment. You don't have to agree with every criticism, but at least address all of them in your response letter. Aim to re-submit your manuscript as soon as possible, while the content is still fresh to the reviewers.

### Have Fun!

You don't have to love every step of the research process, but if you find yourself continually putting off your research projects, then maybe research is not for you. Although publication has always been important for those aspiring to a successful career in academia, it should not be viewed as a be-all and end-all. In an era of widespread social networking, other important directions are available for dissemination. For example, Twitter—one of the most rapidly growing of the social media networks—has been used in the past by physicians at annual meetings of the American Society for Clinical Oncology to provide social commentaries on clinical news and treatment issues<sup>24</sup>.

### SUMMARY

We hope that the ten key points highlighted here will allow trainees and junior oncologists alike to generate successful research projects and, ultimately, to see their work through to publication. However, if we mean to truly help patients and to maintain an active research program, we must also ensure that, while following the ten pearls, we don't neglect life outside of work<sup>25–27</sup>!

### CONFLICT OF INTEREST DISCLOSURES

We have read and understood *Current Oncology's* policy on disclosing conflicts of interest and declare that we have none.

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