

# Research and surgical residency: moving beyond one-and-done projects and motivating for scholarly excellence

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## SUMMARY

Among surgical residents, research is often perceived as a check-mark exercise. Focus then turns to studying for exams and honing skills for independent practice. While some residents are passionate about research and enroll in other formalized training, pragmatists argue that not every surgeon should engage in research at this level. However, no resident should view research as a one-and-done activity. Rather, research should be viewed as an exercise to improve practice, share gaps in knowledge, collaborate, and empower others to formally study and implement change. The skills acquired during research experiences, at minimum, have value in improving the trainee's literature literacy, which in turn serves as a foundational element of continuing medical education. A culture supportive of scientific discovery, facilitated by both faculty and peer-to-peer mentorship, will result in better collaborative efforts and lead to improved knowledge generation and resident research satisfaction.

**W**ithin surgical residency, few activities evoke such a myriad of responses as research. On one end there will be residents who relish the opportunity to break new ground in knowledge generation and may even extend their training timelines to obtain graduate degrees. On the opposite end, some residents will work to actively fill their dedicated research blocks with other pursuits and hope that what output they may have to reluctantly generate will meet their program requirements. Most residents fall between these ends of the spectrum, neither entirely avoiding nor actively contributing to scholarly pursuits. Changes in the current training model need to occur to allow research to play a more foundational role in the development of surgical residents.

Perceptions of the value of resident research in surgical residency and quantification of output is sparse, especially in the Canadian literature. Following the implementation of a formal surgical resident research program at a Canadian academic centre, the number of abstracts and publications per resident increased dramatically.<sup>1</sup> However, during the same time period, a decreased percentage of residents agreed with the idea that residents should be expected to conduct research during their training.<sup>1</sup> The biggest barriers identified to successful surgical resident research included lack of hypothesis guidance; lack of methodological support; lack of time; and, for nearly 20% of residents, lack of interest.<sup>1</sup> None of these barriers are insurmountable, and they require more attention from residency training programs.

Cynicism among trainees should not be entirely surprising. Surgical residency is an onerous commitment following at least 6 previous years of post-secondary education. Given the tight job market for many surgical specialties in Canada, particularly in academic centres, research is increasingly perceived as a means of improving the odds of not only securing a fellowship, but also getting a staff position. A recent cross-sectional survey of academic general surgery in Canada showed that nearly three-quarters of graduates had

completed at least 1 fellowship, with more than 50% having some form of supplementary graduate research training.<sup>2</sup> In the United States, participation in more than 1 year of dedicated research time during surgical residency is an independent predictor of full-time academic appointment and research grant accrual.<sup>3</sup> To support the calibre of research that is now becoming standard within academic medicine, research programs like the Royal College–affiliated Clinician Investigator Program have become central to the research mandate of many residency programs.<sup>4</sup> Unfortunately, these resources essentially cater only to support the few motivated residents who really need no convincing to become researchers. In turn, this may distort the perception of the role of research in surgical training and its practical application to future practice for the majority of residents who do not plan to pursue dedicated research careers.

Apart from the existential benefits research may have on academic career path development, the resident research experience should be nurtured and encouraged for several reasons. A commitment to scholarly pursuits enhances individual practices and promotes dedication to achieving and surpassing health care advances. Within the Royal College of Physicians and Surgeons of Canada’s mandated Competency by Design process, development of a proposal for a scholarly project and/or critical appraisal of the literature are Entrustable Professional Activities within surgical residencies. As a by-product of systematic investigation, agility with literature summation is likely the single most important skill residents build from research experiences. The scientific literature evolves faster than any 1 individual can keep pace with, thus requiring trainees to develop critical and efficient appraisal skills of emerging evidence. As health professionals, residents take on a social responsibility mandate to be users — and ideally producers — of new knowledge to improve patient care. Therefore, research engagement in any form, from a quality-improvement study to publication and knowledge translation, cultivates modes of thinking that motivate personal action initiation via reflection on practice outcomes. Activities including an annual resident research day and regular journal clubs as well as financial support for residents who present at scientific meetings are a few examples of how this can be achieved (Box 1).

#### Box 1. Factors that can improve surgical resident engagement in research

- Dedicated residency research director
- Motivated faculty
- Peer-to-peer research mentorship
- Defined research curricula
- Ongoing research projects for multi-resident involvement
- Regular journal clubs
- Annual resident research day/celebrations of research accomplishments
- Funding for conference participation

To encourage resident research, a brief research course should be delivered to all first-year residents. This training will provide residents with basic research knowledge that will help them develop a research question and provide tools to help them execute a successful project. None of this can occur without a culture, led by interested faculty, that promotes scholarly activity. A recent meta-analysis demonstrated that characteristics of top publishing residency programs include appointment of a residency research director and defined research curricula.<sup>5</sup>

Residents should be encouraged to seek input from peer residents who may have particularly strong backgrounds in research. Peer-to-peer mentorship has transcendental characteristics that benefit all aspects of career development and advancement. This type of collegiality also serves for cooperative inputs resulting in more impactful projects. While many resident research projects are conducted as siloed studies, modern published research is almost entirely multi-authored. Residents in leadership research roles, together with the oversight of involved faculty, should identify impactful areas for study. Such projects, particularly if they are ongoing and potentially have several angles of investigation, would enable residents with novice research interests to productively participate without being saddled with the nuances of hypothesis generation and project initiation. This multi-faceted approach to research using a foundational research course, promotion of a culture of scientific discovery, and peer-to-peer collaboration should improve the odds of successful knowledge generation and resident satisfaction.

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