Surgical research in Canada: How can we re-ignite the pilot light?

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The *Canadian Journal of Surgery* has served as a platform for the dissemination of clinical practice improvements, surgical education techniques, topical discussion and research of all types for decades. Not only have Canadian surgeons (both surgeon-scientists and surgeon-researchers alike) contributed to the journal in a constructive and profoundly productive way that has directly improved surgical care for Canadians, they have also advanced global surgical knowledge via both the traditional subscription-based *CJS* format, and more recently the open access *CJS* platform.

Despite these collective successes, substantial challenges to individual surgical researchers across Canada have become increasingly disruptive and more frequent than ever before. Examples are both general and location specific, but include established as well as new roadblocks that will be problems for many years to come unless measures are enacted to remove them. At the local level, the omission of a consistent emphasis on the importance of research productivity at the residency training level is occurring at most institutions. This includes a reduction of both formal and structured support in some surgical departments/sections, difficulty identifying and engaging experienced local research mentors for junior faculty, and less directed effort toward the pursuit of resident research given work hour reductions, and, therefore, the primary focus during residency has become achieving clinical adequacy.

At the university level, the requirements for second, and sometimes third, applications for research project approval (university-based ethics review, public health care region review, and government/ministry approval) are onerous, and are not seen in other countries. There has been a genuine transition from support for publication-based, data-driven surgical sciences to innovation and business development/ marketing models at the highest administrative levels of some universities, as well as within granting agencies such as the Canadian Institutes of Health Research (CIHR). Fewer efforts and opportunities to formally link busy community hospitals with academic institutions increasingly hamper innovative studies. Even with the desire to perform large studies, the potential need for incredibly expensive randomized controlled trial insurance for international studies is nearly debilitating. Globally, there is also decreased access to funding from both local and national bodies — this increasingly represents the largest hurdle to success. This is compounded by a persistent erosion of the government's understanding of the link between ensuring safe public surgical care and improvements in care delivery based on high-quality research publications in publicly funded health care systems.

There are many possible explanations for these obstacles to continued high-quality research within our surgical practices. Many of them are valid. The most obvious is that our health care systems are stretched in an unsustainable cost escalator that must be addressed. While painful on many fronts, this reality is particularly concerning for surgeons who have made a significant commitment to research productivity. We all know these colleagues within our departments. They believe that surgical research and asking questions such as "why?" and "how?" are essential to the core of our medical discipline and a mandatory commitment to our profession. These surgeons often forgo greater incomes, family time and sleep in an attempt to chase this dream. We should identify these people in our departments and encourage them to continue on their path despite substantial obstacles.¹

Although data are regionally dependent, it is clear that very few surgical trainees are pursuing the route of significant research engagement. According to the National Institutes of Health (NIH), only 1.5% of physicians now engage in medical research.² This is a startlingly low number, considering that physicianscientists have accounted for 37% of all Nobel Prizes in medicine and physiology. Given substantial debt loads, the advancing age of graduates and the constant but unpredictable flux in the supply and demand metrics for various subspecialties, it is not surprising that trainees are less and less interested in a commitment to surgical research (big or small). This is reflected in the reality that surgical researchers receive their first NIH grant at an average age of 45 years. The trend of decreasing publication records among junior faculty (compared with senior faculty) has also been discussed, with observed diversity across various subspecialties.³ In other words, decreased academic productivity, and therefore a less structured commitment to bringing human patient understanding to surgical research, is a clear trend.

The question remains how to best address this issue at all levels (government, university and department). To this end, our Canadian Association of Chairs of Surgical Research (CACSR) have made a strong commitment to define and discuss many of these challenges.⁴ That article identifies many of the current stressors, inequities and obstacles across our country. The CACSR also proposes both a strategic vision and improvement plan to move forward. In a time when surgical researchers yearn for support and commitment to "keep up" with our medical colleagues and to develop real-world improvements in surgical care, the CACSR is a potential shining light. We must also highlight the rare successes, including the Quebec government's salary support program for MD scientists. Although the number of surgeons who qualify is extremely low, their model remains another beacon of hope.5

It is clear that we need to better support students, surgical trainees and junior faculty and ignite their interest in research at the earliest stages of their careers.⁶ This does not equate to gifting publication co-authorship, but rather helping shepherd these motivated colleagues through a sometimes nebulous and counterintuitive pathway to success in research grants, publications and presentations.⁷ Pursuit of a concept from genesis through to peer-reviewed publication in an indexed journal with a reasonable impact factor is hard. The process has no shortcut. The difficulty cannot be minimized. Supporting our colleagues in their research endeavours will help us all avoid surgical burnout, research dismissal and a feeling of researcher equivocation that is so frequently observed in our departments.

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Competing interests: E.J. Harvey is the chief medical officer of Greybox Solutions, the co-founder and head of medical innovation of NXTSens Inc., the co-founder and chief medical officer of MY01 Inc., and the co-founder and director of Strathera Inc. He receives institutional support from J & J DePuy Synthes, Stryker and Zimmer, and he is a board member of the Orthopedic Trauma Association and the Canadian Orthopaedic Association. C.G. Ball declares no competing interests.

DOI: 10.1503/cjs.018819

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