

Surgical innovation is harder than it looks

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A recent issue of *Nature* lamented about the dearth of surgical innovation.¹ “Innovation” is just one of many new catch phrases invading medicine; it has become a hotter phrase than “knowledge translation.” It just sounds so futuristic! It also seems to be applicable across community and academic lines if promoted properly. There are other new buzzwords populating news releases on new opportunities. “Disruptive research” is another commonly used phrase. But almost nothing in medicine is disruptive, contrary to the news releases. New scalpels and laser-guided surgery are not disruptive — they are improvements to older concepts. Similarly, new Global Positioning System technology is not really disrupting the automobile industry; rather, self-driving cars will be disruptive, as they will bring new models of income and potentially free time for other tasks while driving. Hacking Health initiatives are also timely and mantra-like. But products of health hacking are not taking over my operating room and disrupting my practice. So, we are left with surgical innovation as a real goal for surgeons despite a problem with its reported dearth.

Surgeons think of themselves as innovators and great thinkers — so why is it hard to imagine or realize new surgical procedures and techniques? Actually, there are many reasons. As pointed out by the editorial in *Nature*,¹ surgeon-driven grants have decreased, as surgeons apply for fewer funding opportunities. Even though surgical departments value research, individual surgeons feel it is not their role; clinical duties outstrip research desire and, not surprisingly, less output in terms of papers and patents comes from surgical fields. The emergence of alternate science avenues for surgeons has pulled the residents and recent graduates away from core surgical principles. Epidemiology, surgical teaching and simulation research have attracted surgeons less inclined to deal with preclinical modelling. Those older disciplines are seen to be competing in an evermore difficult funding environment. This difficulty is not a perceived problem. Hu and colleagues² looked at National Institutes of Health (NIH) funding for surgical research over a decade ending in 2013. There were fewer surgical grants that underwent review: from 613 down to 512. Additionally, NIH funding fell 19.1%

from \$270 million to \$219 million. Funding for research projects underwent the largest decrease (–38%), including a 39% decrease in R01 awards — theoretically the grant that promotes and encourages individual surgical researchers. Similar results for career awards have been seen for young surgeons (K-award programs).³ It is hard to determine if the same trends are occurring in Canada because the data are not readily available, but it is easy to see how it might be true in the institutions I have visited and where I have worked.

We need to make research and bringing ideas to fruition both easier and more gratifying. The perception that it is too hard to do scientific research means that we need to change the approach to education and execution. The Science of Team Science continues to make inroads and may allow surgeon scientists to contribute to overarching research aims. Also, the education of surgeons in an entrepreneur stream would help the innovators visualize positive outcomes. The startup milieu, though not any easier than traditional research, may appeal to clinical device developers and bring the creative cycle back to the surgeon or surgeon scientist–engineer pairings. That would be disruptive — at least of the current trends in surgeon engagement.

Edward Harvey, MD

Coeditor, *Canadian Journal of Surgery*

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