

Letter

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We need to rethink how to improve surgical research

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Dear editor,

We agree with Rosenberg's paper published in DMJ [1] that surgical research remains weak.

Surgical procedures are complex healthcare interventions that are highly inter- and intraoperator dependent; "unlike 20-milligram tablets, no two surgical procedures are essentially the same". Challenges in evidence-based surgery arise from surgeons' personal preferences, skill level, education (mentoring) and personality. Surgical procedures involve team members (i.e., anaesthetists, surgical assistants and nurses) and associated pre-, peri- and post-operative interventions, all of which may influence the outcome of an operation.

Furthermore, trials including sham compared with conventional surgeries are rare for numerous good reasons (mainly due to a lack of patient willingness to participate). In an effort to obtain sufficient sample sizes, collaborative work has been attempted, but this has not produced the expected breakthroughs [2].

To sustain and improve surgical skills, time with the "*knife in the hand*" is essential for surgeons. However, this may divert the *academic* surgeons' attention from the patient as a complete bio-psycho-social entity to the specific procedure as the most important. An example is vagotomy, or severing the vagal nerve to treat peptic ulcer. Decades of improvement in surgical technique have produced a highly selective vagotomy procedure that was mastered by few surgeons. Vagotomy was destined to disappear into oblivion after the discovery of protein pump inhibitors by a physician researcher.

Then, how to tackle the complex nature of surgical intervention?

The myriad of factors that affect surgical outcome may resemble the myriad of factors that affect climate change. We have high-performing predictive models to describe climate change nowadays - thanks to the implementation of information technologies (IT), in particular artificial intelligence (AI). We believe that AI can help tackle (some of) the challenges in surgical research. The attempt to improve surgical technique by crunching hundreds of operation video films to extract patterns of best technique is just one example of implementation of AI in surgical research. Machine learning models to examine intraoperative blood supply of the colon and AI decision-support systems in orthopaedic surgery are exiting new fields that may change the future of surgical research. No wonder, then, that many of the leading academic centres are currently exploring the implementation of IT, especially the perspectives of AI in healthcare interventions.

A group of international surgeons (including the first author) have joined forces to initiate an international research organisation coined OpenSourceResearch Collaboration (OSRC.network). The group has succeeded with numerous publications and established many public and private partnerships to explore the

implementation of IT in surgical research.

But, most importantly, the academic surgeon who speaks both the language of the clinic and that of research fluently is becoming an endangered species [3]. A mounting pressure exists on surgeons to increase clinical and administrative work at the cost of research time. Allocating sufficient time and resources (**Table 1**) to academic surgeons may potentially transform surgical research from comic operas to a leading force in healthcare development.

TABLE 1 Suggested road map to encourage academic surgeons. Note that support from the department is essential in most of these issues.

Type of support	Responsibility
Protected research time	Department
Salary support to offset clinical productivity demands (e.g., senior researcher grant)	Department
Mentorship	Department
Initial research funds	Department/ hospital/ university
Personnel (technicians, secretary, research nurse, laboratory space/computing infrastructure... etc.)	Department
Support from chair (division chief, department leader, hospital director, etc.)	Department/ hospital/ university
Understanding of and support for the role of academic surgeon among colleagues in the department	Department

If we want surgery to continue and thrive as a science, we need to take care of academic surgeons.

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REFERENCES

1. Rosenberg J. Surgical research remains comic opera and maybe for good reasons. *Dan Med J* 2021;68(12):A10210792
2. El-Hussuna A, Tolani MA. Current status and future perspectives of collaboration in surgical research: A scoping review of the evidence. *Surgery* 2021;170(3):748-755.
3. Kodadek LM, Kapadia MR, Changoor NR, et al. Educating the surgeon-scientist: A qualitative study evaluating challenges and barriers toward becoming an academically successful surgeon. *Surg.* 2016;160(6):1456-65.