

# The current state of resident trauma training: Are we losing a generation?

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#### SUMMARY

General surgeons provide life-saving trauma care to a large portion of Canadians. Although trauma care has evolved significantly over the last few decades and now requires fewer operations, when a life-saving operation is required the expectation of competence to perform this operation has not been reduced. A recent study from the United States found decreased resident case-log volumes of trauma operations. Such findings raise the alarm of declining exposure of residents to trauma operations and beg the question of whether graduating residents are competent to care for trauma patients. Examination of the Canadian setting reveals a dearth of published information about the actual exposure of Canadian general surgery residents to trauma care. With the forthcoming evolution of general surgery education into competency-based medical education, we sound a call to action to ensure that all graduating general surgeons are able to provide the care that both the Royal College of Physicians and Surgeons of Canada and the Canadian public demand.

For decades, general surgeons have provided clinical care to many of the nearly 250 000 injured Canadians annually. Given both our geography (more than 7 million Canadians reside farther than a one-hour drive from a level-1 trauma centre) and weather, we continue to rely on local hospitals to provide life- and limb-saving trauma surgeries before transferring patients to a major centre for definitive care.<sup>1</sup> At the heart of these hospitals and operations are general surgeons.

Our approach to trauma care has evolved in recent decades. Augmented involvement of subspecialties, provision of care within a multidisciplinary team-based paradigm and increasing responsibility for trauma education have required that general surgeons develop their nontechnical skills to be the “quarterbacks” of trauma care. The wider availability of high-quality diagnostic imaging, evidence-based strategies for nonoperative management and increased use of interventional and endovascular technology have reduced the frequency of emergency operative interventions for trauma. Thankfully, the required competency to perform a life-saving operation has not changed.

The impact of modern trauma care on surgical training was recently evaluated: Strummwasser and colleagues<sup>2</sup> reviewed the operative case logs of general surgery residents in the United States over the past 15 years. The number of trauma and nontrauma operations as well as the impact of fellowship training on trauma case logs were assessed. Not surprisingly, results revealed both decreased operative trauma and nontrauma exposure among residents over time. The authors concluded that “even with fellowship training, the graduating trauma/critical care fellow is still only as experienced in open trauma surgery as a general surgery resident who graduated 15 years ago.” The authors acknowledge the substantial evolution in trauma care that has occurred over this timeframe, but also raise difficult questions: What is the acceptable operative exposure in residency training? What should a graduating general surgery resident be expected to be able to do?

In Canada, we do not have a national database of resident operative logs. Each Royal College residency program individually assesses its residents and determines whether they have met the clinical objectives of training (i.e., whether they are

eligible to sit their graduating examination). There is no mandatory minimum for the number of operations performed, type or complexity of managed injuries, or number of call nights completed. The inherent ambiguity of this approach has now fostered competency-based medical education.

So, how do we know that our residents are actually competent to provide trauma care? The existing literature reports a disconnect between graduating residents' perception of their competence (80% state being comfortable on call at a level-1 trauma centre<sup>3</sup>) and that of the fellowship program directors who supervise them (who deemed two-thirds of incoming fellows unable to operate for 30 unsupervised minutes in a major procedure<sup>4</sup>).

In Canada, the provision of trauma care is still embedded within the identity of the Royal College-trained general surgeon. The objectives of training for general surgery<sup>5</sup> outline medical expert competencies in the principles of initial management and resuscitation (i.e., Advanced Trauma Life Support); nonoperative management of traumatic injuries; knowledge of trauma surgical anatomy; management of injuries to the head, neck, chest, abdomen, pelvis, extremities and soft tissues; and special populations, such as trauma in pregnancy, pediatrics and geriatrics. The current operative "A list," for which "the graduate must be competent to independently perform these procedures" includes multiple trauma operations: surgical airway; surgical exploration of penetrating neck injuries; resuscitative thoracotomy; trauma laparotomy, including exploration of retroperitoneal hematomas; and damage control surgery for massive intra-abdominal hemorrhage or multiple intra-abdominal injuries. Furthermore, the collaborator competency mandates the graduate must be able to "assume the role of trauma team leader (TTL)." The bar appears to be set, and it is appropriately high. After all, these graduating surgeons will be expected to provide life- and limb-saving trauma care to the 20% of Canadians who do not have local access to a level-1 trauma centre staffed with dedicated expert trauma surgeons.<sup>1</sup>

Although mounting evidence supports that performance of a specific number of operations does not necessarily equate to competency, we can agree that surgical trainees should receive appropriate exposure to trauma patients and conditions. So, what is the typical trauma experience for Canadian general surgery residents? The answer is not clear. We do not have mandatory national operative case logs to monitor resident volume. A search of Canadian journals uncovered a dearth of literature on this topic. Even more concerning is that conversations with colleagues, chief residents and recent graduates entering fellowship programs reveal an emerging narrative of graduates not ever having fulfilled the role of TTL successfully or having been an independent operator for a trauma laparotomy. Even the nonoperative management of severely injured polytrauma patients on a trauma service remains suspect.

Can we assume that our residents are obtaining exposure to trauma care on a daily basis given their regular on-call

duties? Perhaps. However, there is impressive nationwide variation on the types of clinical rotations residents complete, the type of hospital in which they rotate, and the level of training on a given rotation. For example, some training programs possess a single trauma centre, but five or more mandatory teaching hospitals. As a result, a resident's exposure to trauma care is almost exclusively limited to their three- to six-month rotations through the trauma centre. In contrast, other training programs may centralize their residents to core hospitals (including the trauma centres), possibly providing more consistent, longitudinal and comprehensive trauma care exposure. But even if the resident is on call at a trauma hospital, does (s)he respond to all trauma activations or just the operative cases? Does (s)he function as the TTL? And if (s)he is doing home call, how does (s)he get to the hospital fast enough to gain the experience of doing a resuscitative thoracotomy? Although most programs rotate senior residents through the trauma service, outliers to this tradition remain.

In the modern era of medical education and competency-based medical education with entrustable professional activities, we argue clear answers to these questions are sorely needed.

As with most problems, the first step is recognition and acknowledgement. We hereby challenge all Canadian general surgeons to start a realistic and accurate measurement of resident trauma education. We suspect it will be the only method for establishing a clear plan to ensure that all graduating general surgeons are able to provide the care that both the Royal College and the Canadian public demand.

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