ORIGINAL REPORTS

Transition to Residency: The Successful Development and Implementation of a Nonclinical Elective in Perioperative Management

Heather McDonald, BSc, * *Nada Gawad, MD,*[*,†] *Isabelle Raîche, MD, MAEd, FRCSC,*[*,†] *and Fraser D. Rubens, MD, MSc, FACS, FRCSC*[*,†,‡]

*Faculty of Medicine, University of Ottawa, Ottawa, Ontario, Canada; [†]Department of Surgery, The Ottawa Hospital, Ottawa, Ontario, Canada; and [‡]Division of Cardiac Surgery, University of Ottawa Heart Institute, Ottawa, Ontario, Canada

OBJECTIVE: Few medical school programs in Canada address challenges related to the significant increase in responsibility for patient care between medical school and residency. This is particularly important in surgery and anesthesia due to the high-acuity care required during the perioperative period. The purpose of this study was to develop and assess a program that would help students transition to surgical and anesthesia residencies, in terms of knowledge acquisition, clinical decision-making skills, and subjective preparedness.

DESIGN: The authors developed a 1-week nonclinical Perioperative Management Elective for students matching to surgical or anesthesia residencies. Clinical decision-making training was incorporated using a simulated pager called the MedsOnCall Pager app. A study was conducted to evaluate knowledge acquisition and development of clinical decision-making skills in students completing the elective. A mixed-effects model analysis of the proportion of pages answered correctly during the elective was used as a marker of their progression. Students were asked to complete entry and exit questionnaires to provide subjective information regarding their elective experience.

SETTING: The study ran for 2 iterations of the elective in 2016 and 2017 at the University of Ottawa.

PARTICIPANTS: A total of 20 University of Ottawa fourth-year medical students completed the elective.

RESULTS: There was a significant increase in the proportion of correctly answered pages over the course of the elective week ($p = 0.04$). Results from entry and exit questionnaires revealed that students felt more knowledgeable, comfortable, and prepared for residency after completing the elective ($p < 0.001$).

CONCLUSIONS: The Perioperative Management Elective has completed 2 successful iterations with confirmed knowledge acquisition and improved clinical decision-making skills among elective students. Participating students perceived that the experience was beneficial and fulfilled a gap in their medical school training. We believe that this elective framework could be employed by other schools to help graduating students' transition smoothly into residency. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: perioperative care, surgical management, medical student education, anesthesiology, curriculum development, transitions

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement

INTRODUCTION

There is a steep learning curve when transitioning from the role of a medical student to that of a surgical resident.[1] A first-year surgical resident theoretically has the support

This work was supported by the University of Ottawa Summer Studentship on Innovation in Undergraduate Medical Education, Ottawa, ON [2015]; The Ottawa Hospital Department of Surgery, Ottawa, ON; The Canadian Federation of Medical Students Student Initiative Grant, Ottawa, ON [2016]. The funding sources listed above had no role in the conduct of the research or preparation of the article.

Correspondence: Correspondence: Inquiries to Heather McDonald, Faculty of Medicine, University of Ottawa, 8 Davenport Private, Ottawa, Ontario, Canada K1K 4W5; e-mail: hmcdo032@uottawa.ca

 http://dx.doi.org/10.1016/j.jsurg.2017.08.022

and guidance of senior residents and practicing physicians when making clinical decisions. However, the safety-net provided by senior members of the team tends to become fragile during duty shifts, when calling for help is implicitly perceived as a weakness.[2,3] In a culture where independence is praised,[3] many first-year residents are not equipped for the responsibility of independently managing high-acuity surgical patients on the floor. A 2009 study carried out at 11 American and Canadian schools found that most of the new surgical residents felt illprepared.[1] This lack of preparation has consequences for both patient outcomes and resident mental health.

The "July Effect" postulates that there are more patient deaths in this month due to an influx of new residents. For example, increased medication error in July has been shown to be a significant contributing factor to increased patient mortality.[4] Not surprisingly, residents may also suffer during this transition. After 3 resident suicides over 19 months in New York City, a medical resident wrote about the widespread issue of how "first-year trainees [are] made to feel incompetent by supervisors who neglected to teach them practical patient management skills."[5] A 2011 study investigating the factors that contribute to preparedness in residency concluded that decision-making and prioritization were among the most important.[6]

In 2014, American stakeholders in surgery published a consensus statement recommending that all medical school graduates entering a surgical residency complete a preparatory program before starting formal training.[7] Since 2015, the American Board of Surgery has been piloting a 4-week American ACS/APDS/ASE Resident Prep Curriculum in 47 schools across the United States.[8] Surgical residents who completed similar programs report higher levels of overall self-confidence.[1] Few surgical residency preparatory programs offered within medical school exist outside of the United States, and specifically Canada is deficient in this respect. Unfortunately, the fourth year of Canadian medical school does not easily lend itself to a 4-week program such as the one piloted in the United States; therefore, a novel approach to a transitionary curriculum was required. Although the ideal time to offer such a course is not known, it has been suggested that the fourth year of medical school may be undervalued and misused, and therefore offers an opportunity to actively prepare students for residency.[9]

Needs assessment conducted at the University of Ottawa provided further evidence that students feel illprepared to start surgical residencies. The needs assessment had the following 3 components: (1) a survey completed by third- and fourth-year medical students, (2) a focus group completed by junior surgical residents, and (3) a cross-reference of the medical school curriculum objectives with the Royal College of Physicians and Surgeons of Canada's Objectives of Surgical Foundations Training[11] and the American ACS/APDS/ASE Resident Prep Curriculum.[8] Surgical Foundations lays out objectives to be covered by the end of year 2 residency, including perioperative management (POM) topics such as fluid management and antibiotics in the perioperative setting. The ACS curriculum was designed to help students in the United States entering surgical residencies prepare for this responsibility through an intensive 4-week preparatory course and their framework is currently being used by 47 schools across the United States Review of the University of Ottawa undergraduate curriculum revealed that it does not explicitly cover POM objectives. Accordingly, students identified these perioperative topics as being areas of deficiency in their own skill set, and accounting for their lack of confidence in responding to surgical patient issues on the floor. As a result, medical students intending to enter a surgical speciality felt illprepared to start residency. Residents in Ottawa commonly reported that medical students are not making independent clinical decisions about surgical patients while completing their surgery rotation. Therefore, students graduating from the university were perceived by residents as lacking the training to independently manage surgical patients once they transition to residency.

At the University of Ottawa, incoming surgery residents are required to complete a 2-week Surgical Foundations Residency Bootcamp. Although some of this time is spent on POM in the context of on-call scenarios, most of the boot camp is focused on technical skills. Furthermore, not all residency programs offer such a boot camp and therefore there is no guarantee that medical school graduates from the University of Ottawa will receive training of this nature. During students' third-year surgical rotation, they have the opportunity to practice technical skills and learn about surgical procedures, but there is little focus on pre- and post-operative management skills such as blood transfusions, antibiotic prophylaxis, anticoagulation, and diabetes management.

This study was therefore conducted to develop and evaluate an educational intervention to overcome the identified problem: the significant gap in knowledge and responsibility between medical students and surgical residents, specifically when managing pre- and post-operative patients on the floor. There are 2 aspects to this study, they are (1) development and implementation of the intervention and (2) evaluation of the intervention.

MATERIAL AND METHODS

A 6-step method based on the work of Kern[10] (Table 1) was utilized as a framework for curriculum development in designing an intervention for the identified problem. A targeted needs assessment had already been performed. Next steps included developing objectives for the curriculum, based off of the needs assessment, and determining what