

# Growing the 'SEAD': Expansion of the Surgical Exploration and Discovery Program

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**BACKGROUND:** The declining popularity of surgical specialties among North American medical students has been attributed partially to limited early exposure and minimal involvement of surgeons in preclerkship education; in response, the Surgical Exploration and Discovery (SEAD) program was developed at the University of Toronto in 2012. SEAD is a 2-week curriculum that provides first-year medical students comprehensive exposure to surgical specialties through operating room observerships, simulation workshops, and career discussions. This study is the first to examine implementation of the SEAD program at another site.

**METHODS:** This prospective cohort study evaluated the effectiveness of the SEAD program in improving surgical knowledge and facilitating career decision making when compared with a control group. In all, 18 students participated in the SEAD program, and 18 students from the same class read only the program's instructional manual; both the groups completed multiple-choice tests and questionnaires at baseline and at completion to assess knowledge acquisition and career-related learning.

**RESULTS:** Both the groups significantly improved their surgical knowledge, but there was no difference between groups. SEAD participants made significantly greater progress in refining their career decisions when compared with the control group; all but one SEAD participant either gained interest in or ruled out a surgical specialty as a potential career choice compared with only 10 of the participants reading the manual only.

**CONCLUSIONS:** The SEAD program provides a meaningful opportunity for medical students to explore surgical careers during preclerkship and to make better-informed career decisions. This expansion demonstrates that the program can be successfully reproduced at another institution. (J Surg Ed 73:101-110. © 2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

**KEY WORDS:** undergraduate medical education, medical students, surgical education, simulation, career choice, surgery

**COMPETENCIES:** Medical Knowledge, Practice-Based Learning and Improvement, Systems-Based Practice

## INTRODUCTION

Over the last 2 decades, interest in surgical specialties has decreased among North American medical students applying for residency positions.<sup>1-6</sup> Azzadeh et al.<sup>8</sup> note that this declining interest is concerning, as it could jeopardize the quality of surgical residents and ultimately the quantity of the surgeons caring for an aging population with a growing need for operations.<sup>7</sup>

To better understand the declining surgical interest among medical students, many investigators have reported on the factors influencing career choices.<sup>8-11</sup> In addition to a growing focus on lifestyle,<sup>8</sup> studies have shown that poor early exposure and minimal involvement of surgeons in preclerkship education are barriers to creating interest in the field.<sup>3,5,12</sup> In their present format, North American undergraduate medical education curricula limit surgical training primarily to the clerkship years.<sup>13,14</sup> However, most of the

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medical students predict their ultimate specialty choice before beginning clerkship<sup>5,11,15</sup>; Zeldow et al.<sup>11</sup> found that more than two-thirds of students predicted their specialty choice by the end of their second year.

As Gawad et al.<sup>16</sup> note, there is a missed opportunity to positively influence medical students toward pursuing a surgical career. Medical students are exposed to surgical specialties late in their career decision-making process, and their exposure even at that stage is incomplete, as clerkship students only rotate through a limited number of surgical specialties in their mandatory clinical placements. In 2004, the American Surgical Association acknowledged medical students' declining surgical interest and put forward recommendations to address the foregoing contributing factors.<sup>17</sup> Among other recommendations, the American Surgical Association advised that surgical faculties should increase their involvement in preclerkship undergraduate medical education and that clinical skills laboratories should be leveraged in students' surgical training.<sup>17</sup> As the factors influencing career choices are better understood and formal recommendations have been put forward, innovative programs have been developed to stimulate interest in surgery among medical students.<sup>14-16,18</sup> Although a sustained recovery has not been observed, in recent years, there has been an increase in interest in surgical careers in North America.<sup>19</sup> Going forward, an important challenge facing medical schools and surgical departments will be identifying which preclerkship programming approach is the most productive use of limited resources, such as surgeons' time and simulation center assets.

The Surgical Exploration and Discovery (SEAD) program is an example of an initiative developed to provide experiential learning opportunities for preclerkship medical students interested in surgical careers. Founded at the University of Toronto in 2012, SEAD is a 2-week program that provides preclerkship students with exposure to direct-entry surgical specialties through structured operating room (OR) observerships, hands-on simulations, and informal discussion on surgical careers.<sup>16</sup> The program has run successfully for 3 years in Toronto; Gawad et al.<sup>16</sup> have outlined its structure and demonstrated its success for the inaugural cohort. Over the course of the program, all 19 participants in the 2012 program cohort were able to identify interests in new specialties and most were able to also rule out specialties in which they were not interested.<sup>16</sup>

Based on the program framework developed by Gawad and her colleagues at the University of Toronto, the University of Ottawa initiated the first Canadian expansion of the SEAD program in 2014. The Ottawa SEAD program maintained a similar structure to the original Toronto program, with some minor variations in the surgical specialties included and the content of the workshops.

The purpose of this study was 2-fold: (1) to evaluate the effectiveness of the SEAD program in improving surgical knowledge and facilitating career decision making when

compared with a control group of medical students reading only an instructional manual and (2) to assess if the fundamental features of the SEAD program developed at the University of Toronto are transferable to another institution. The findings of this study would help to inform other medical schools looking to improve student experiences in surgical specialties during preclerkship by providing data as to the reproducibility and value of the SEAD program.

## MATERIAL AND METHODS

### SEAD Program Curriculum at the University of Ottawa

The SEAD program at the University of Ottawa closely resembled the original curriculum developed by Gawad and her colleagues at the University of Toronto.<sup>16</sup> The program ran for 2 weeks in the summer and included students having just finished their first year of medical school. The program was coordinated by second-year students and ran in collaboration with the University of Ottawa, Faculty of Medicine; University of Ottawa, Department of Surgery; and the University of Ottawa Skills and Simulation Centre (uOSSC). All divisions within the Department of Surgery (general surgery, plastic surgery, orthopedic surgery, urology, neurosurgery, cardiac surgery, vascular surgery, and thoracic surgery) as well Otolaryngology-Head and Neck Surgery were included. The chief of each surgical division appointed a supervising surgeon to guide curriculum development. Each division was assigned a second-year medical student liaison who worked with the supervising surgeon to coordinate the division's participation. Over the course of the 2 weeks, students were exposed to 9 surgical specialties across 3 domains:

1. *OR observerships*: Students spent 1 morning (8 AM-12 PM) observing each of the 9 specialties in the OR. Each student had a different observership schedule that was unrelated to the simulation workshop in the afternoon.
2. *Career discussions*: All students came together at the simulation center in the afternoon. Over lunch (12 PM-1 PM), a surgeon facilitated a discussion and answered questions on his or her respective specialty. The discussion covered training, fellowships, scope of practice, daily responsibilities, and work-life balance. Each specialty provided 1 session.
3. *Simulation workshop*: Each afternoon (1 PM-4 PM), the division that provided the lunchtime career discussion then proceeded to run a 3-hour, hands-on, simulation workshop. The simulation curriculum was developed collaboratively with the Surgical Lead of the uOSSC and the supervising surgeon facilitating the workshop; the goals of the session were to

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