ORIGINAL REPORTS

Developing a National, Simulation-Based, Surgical Skills Bootcamp in General Thoracic Surgery

Colin Schieman, MD, FRCSC, Hideki Ujiie, MD, PhD,† Laura Donahoe, MD, FRCSC,† Waël Hanna, MD, MBA, FRCSC,‡ Richard Malthaner, MD, MSc, FRCSC, FACS,§ Simon Turner, MD, Med, FRCSC,‖ Kasia Czarnecka, MD, FRCPC, MPH,† and Kazuhiro Yasufuku, MD, PhD†,¶*

*Section of Thoracic Surgery, Cumming School of Medicine, University of Calgary, Calgary, Alberta Canada; †Division of Thoracic Surgery, University of Toronto, Toronto, Ontario, Canada; ‡Division of Thoracic Surgery, McMaster University, Hamilton, Ontario, Canada; §Division of Thoracic Surgery, Schulich School of Medicine, Western, London, Ontario, Canada; ‖Division of Thoracic Surgery, University of Alberta, Edmonton, Alberta, Canada; and ¶Toronto Interventional Thoracic Surgery Program, University of Toronto, Toronto, Ontario, Canada

BACKGROUND: The use surgical simulation across all subspecialties has gained widespread adoption in the last decade. A number of factors, including the small number of trainees, identified gaps in surgical skill training from cross-sectional surveys, increased national collaboration, and support from the national specialty committee identified a need to construct a surgical skills "bootcamp" in thoracic surgery in Canada.

OBJECTIVE: The goals of the surgical skills bootcamp, as identified by the residency training program directors and the national specialty committee were to create a national, centralized, simulation-based skills workshop that focused on key foundational procedures within thoracic surgery, particularly those identified as areas of weakness by former residents; to smooth the transition to intraoperative teaching; to provide exposure to important but not necessarily universally available procedures such as advanced endoscopy; to teach non-medical expert competencies, and lastly to provide a venue for networking for residents across the country.

DESIGN: The curriculum committee has constructed a 3.5 day curriculum, with a focus on hands-on skills simulation, as well as lectures, on a breadth of topics including benign esophageal disorders, lung cancer staging, minimally invasive lung surgery, crisis management and advanced bronchoscopy and endoscopy. All residents across the country attend as well as faculty from a variety of institutions.

SETTING: The course is hosted centrally at the University of Toronto, Ontario over 3.5 days. A combination of auditorium and both animal and human operating room facilities are utilized.

METHODS: A needs-assessment based on a formal meeting of the program directors, as well feedback from surveys identified the target areas for curriculum development. A committee of interested faculty developed the content as well as the local construct and logistics required. Iterative feedback has evolved the duration and content over the initial 3 years.

RESULTS: Through formal resident feedback, national subspecialty committee review, and program director meetings the support for the bootcamp has been overwhelmingly positive. Specific resident feedback for structure, content and specific simulations has been favorable, but has also been used to modify the program.

CONCLUSION: In response to identified weaknesses in training, with the support of the national specialty committee, the residency program directors, and the faculty at the University of Toronto, an intensive simulation based thoracic surgery bootcamp has successfully been created for Canadian thoracic surgery residents. (J Surg Ed ■:■■■-■■■. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

An iterative, collaborative, needs-based project.

Correspondence: Inquiries to Colin Schieman, MD, FRCSC, Section of Thoracic Surgery, Cumming School of Medicine, University of Calgary, Rm G33H, 1403 29th Street NW, Foothills Medical Centre, Calgary, Alberta, Canada T2N 2T9; fax: +(403) 270-8431; e-mail: Colin.schieman@albertahealthservices.ca

  1931-7204/$30.00 https://doi.org/10.1016/j.jsurg.2017.11.008

KEY WORDS: thoracic surgery, surgical simulation, lobectomy simulation, laparoscopic simulation

COMPETENCIES: Patient Care, Professionalism

BACKGROUND

The use of simulation for surgical education has undergone considerable development and has gained widespread use and adoption within the last decade. Virtually all surgical specialties have reported the use of simulation, either as it relates to technical skill acquisition, to team-based crisis management, or to preoperative planning.[1,2] In general, several studies and systematic reviews conclude that while the available studies are prone to bias, simulation appears superior to no practice at all, and tissue-based simulation appears to be superior to model training.[2] More recently in cardiothoracic surgery in the United States a dedicated team of faculty, in conjunction with the Thoracic Surgical Directors Association (TSDA) have developed an annual TSDA Bootcamp.[3] The TSDA Bootcamp teaches mixed content in both basic cardiac and thoracic skills with 1 to 3 of the stations focusing on skills that are specific to general thoracic surgery.

IMPORTANT EVENTS LEADING TO THE CREATION OF THE CANADIAN THORACIC BOOTCAMP

In Canada, a combination of 5 main factors culminated in the needs-assessment and construction of a national, collaborative, hands-on Bootcamp in general thoracic surgery. (1) Unlike in some jurisdictions, thoracic surgery residency training in Canada is focused on general thoracic surgery, and is a secondary residency typically following completion of general surgery residency. Although residents complete rotations in cardiovascular surgery they do not become accredited cardiovascular surgeons at the time of graduation. Residencies in cardiac surgery and thoracic surgery are entirely separated. (2) In Canada, there are 8 thoracic surgery residency programs that are accredited by the Royal College of Physicians and Surgeons of Canada (RCPSC), which are 2 years in length and graduate 6 to 8 surgeons per year in total nationally.[4] Each program is therefore small, with 1 to 2 residents each. (3) A series of surveys of residents (Thoracic Manpower and Education (TMED) Surveys), recently graduated thoracic surgeons and residency program directors in 2011 and 2012 identified perceived gaps in skill development in certain areas and operations within thoracic surgery.[5,6] (4) Further, the RCPSC Specialty Committee in Thoracic Surgery voiced formal support that all thoracic residency programs work toward fostering a national collaboration in teaching the non-"Medical Expert" competencies and increased simulation-based teaching. A workshop of program directors held in 2013 identified the challenges in delivering high-quality instruction in competencies not related to medical expertise, such as "Collaboration" and "Professionalism" that lent themselves nicely to collective teaching rather than teaching individual residents in individual programs. (5) Lastly, at the University of Toronto a standard of excellence in simulation-based training existed with their endobronchial ultrasound (EBUS) course,[7] which lent itself to a geographically central site for thoracic simulation training. As result, the first interventional thoracic surgery training course (aka the Bootcamp) was held in 2014 at the University of Toronto, and has since been repeated in 2015, 2016, and 2017. A total of 70 trainees have completed the bootcamp program since its inception.

This article aims to summarize the key objectives of the Bootcamp, outline the course's construction, and describe some of the unique simulations that have been developed.

IDENTIFIED NEEDS AND OBJECTIVES OF BOOTCAMP

(1) To teach important background clinical knowledge and fundamental understanding of the operative steps for core thoracic procedures, particularly those identified as areas of weakness by the TMED surveys.
(2) To teach hands-on, foundational surgical skills across some of the key procedures within thoracic surgery, to facilitate a smoother transition into performing real-life surgeries.
(3) To develop competency in nonmedical expert areas such as: medi-colegal risks for the thoracic surgeon, professionalism, transition to practice, and team-based crisis management.
(4) To obtain exposure to important, but not necessarily universally available procedures and techniques in thoracic surgery, such as: navigational bronchoscopy, robotic lung resection, EBUS, and peroral endoscopic myotomy (POEM).
(5) To afford opportunities for trainees to network and meet their peers and colleagues from across the country.

OUTLINE AND DESIGN OF THE BOOTCAMP

As a recommended product of the RCPSC Specialty Committee in Thoracic Surgery, the Bootcamp was intended to address the needs of all training programs and to integrate instructors from a variety of training programs across the country. There was initially consideration given to rotating the geographic location of the course, but given the infrastructure, resources, and expertise at the University