

# Identifying Areas of Weakness in Thoracic Surgery Residency Training: A Comparison of the Perceptions of Residents and Program Directors

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**OBJECTIVE:** To identify core thoracic surgery procedures that require increased emphasis during thoracic surgery residency for residents to achieve operative independence and to compare the perspectives of residents and program directors in this regard.

**METHODS:** A modified Delphi process was used to create a survey that was distributed electronically to all Canadian thoracic surgery residents (12) and program directors (8) addressing the residents' ability to perform 19 core thoracic surgery procedures independently after the completion of residency. Residents were also questioned about the adequacy of their operative exposure to these 19 procedures during their residency training. A descriptive summary including calculations of frequencies and proportions was conducted. The perceptions of the 2 groups were then compared using the Fisher exact test employing a Bonferroni correction. The relationship between residents' operative exposure and their perceived operative ability was explored in the same fashion.

**RESULTS:** The response rate was 100% for residents and program directors. No statistical differences were found between residents' and program directors' perceptions of residents' ability to perform the 19 core procedures independently. Both groups identified lung transplantation, first rib resection, and extrapleural pneumonectomy as procedures for which residents were not adequately prepared to

perform independently. Residents' subjective ratings of operative exposure were in good agreement with their reported operative ability for 13 of 19 procedures.

**CONCLUSION:** This study provides new insight into the perceptions of thoracic surgery residents and their program directors regarding operative ability. This study points to good agreement between residents and program directors regarding residents' surgical capabilities. This study provides information regarding potential weaknesses in thoracic surgery training, which may warrant an examination of the curricula of existing programs as well as a reconsideration of what the scope of practice of a general thoracic surgeon should entail. (J Surg 71:360-366. © 2014 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

**KEY WORDS:** thoracic surgery, surgical education, operative ability

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

## INTRODUCTION

Identifying areas of weakness in surgical training programs allows for modification and amelioration of the training process with the ultimate goal of producing ever-more competent and confident surgeons. The literature is replete with studies attempting to evaluate surgical training programs and the abilities of surgical trainees to this end. In the field of thoracic surgery, the Thoracic Manpower and

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Education Study was conducted to describe the current state of thoracic surgery in Canada.<sup>1</sup> Earlier publications from this study have raised concern regarding residents' preparedness for independent practice and suggested that a majority of thoracic surgery residents felt further training would be necessary for this reason.<sup>2,3</sup>

For programs to improve the preparedness of their trainees for independent practice, areas of operative weakness must first be identified. The primary goal of our current study was to identify particular areas of operative weakness within thoracic surgery training programs in Canada, comparing the opinions of program directors (PDs) and residents. We also evaluate residents' exposure to core thoracic surgery procedures and determine if exposure correlates well with subjective ratings of operative ability.

## METHODS

### Instrument Development

As no suitable validated instruments were identified through a review of the literature, a survey was developed de novo. A preliminary list of items, including a list of core thoracic surgical procedures, was established by members of the study group (E.K. and C.S.). A modified Delphi process was then employed to refine this list. Feedback from 10 thoracic surgeons from across Canada was then solicited to increase face and content validity.

The PD survey included questions regarding the respondents' own demographics, details of their individual programs including an assessment of their residents' work hours, and their overall opinion of their residents' operative caseload on a 3-point scale (too little, about the right amount, or too much). Respondents were also asked to rate their residents' ability to perform 19 core thoracic surgery procedures independently using a 3-point scale (able, unable, or uncertain). For analysis purposes, "unable" and "uncertain" were grouped together as both responses were felt to represent inadequate subjective ability to perform a procedure independently.

The resident survey addressed demographics, work hours, and asked respondents to rate their own ability to perform 19 core thoracic surgery procedures independently on a 3-point scale (able, unable, or uncertain). For analysis purposes, "unable" and "uncertain" were grouped together as neither response was felt to represent adequate subjective ability to perform a procedure independently. They were also asked to rate their operative exposure to these 19 procedures on a 5-point Likert-type scale (none, little, adequate, good, or excellent). For analysis purposes, this 5-point scale was simplified to a 2-point scale with "none" and "little" being considered "inadequate" and "adequate," "good," and "excellent" being consolidated as "adequate."

Ethics approval for this study was received from the Conjoint Health Research Ethics Board of the University of Calgary (Ethics ID E-24556).

## Survey Administration

PD information for thoracic surgical training programs is publicly available on the Canadian Association of Thoracic Surgeons website ([www.canats.org](http://www.canats.org)). As no Canada-wide registry of thoracic surgical trainees currently exists, PDs were contacted and asked for a list of their current trainees with contact information. In this way, contact lists for both groups were established, and surveys were distributed electronically via SurveyMonkey.com (Portland, Oregon). The surveys were available from May 6 to June 30, 2009. To enhance face validity and encourage participation, a cover letter indicating support from the president of the Canadian Association of Thoracic Surgeons was included. Three reminders were sent to nonresponders in both groups as well as a personal email from the principal investigator (S.G.) to ensure maximal study response rates before closing the survey. Responses were collected anonymously to maintain confidentiality owing to the small sample sizes and sensitive information being collected.

## Data Analysis

Raw and coded responses were downloaded directly from SurveyMonkey.com. The data were verified by the study coordinator (E.K.) before being imported into SPSS 15.0 (Chicago, IL) for analysis by 1 author (E.O.P.).

The statistical analysis began with a separate descriptive summary of the data for each group, including calculation of frequencies, means, and proportions.

A comparison of the perceptions of PDs and residents regarding operative ability for the 19 core thoracic surgical procedures was then carried out. This was done using the Fisher exact chi-square as many cells had values below 5. A Bonferroni correction was employed to control the family-wise error rate associated with the multiple tests computed. Given that 19 tests were performed, individual tests with  $p < 0.0026$  were considered statistically significant.

Similarly, the relationship between residents' perception of their operative ability compared with their subjective rating of operative exposure was explored using Fisher exact chi-square along with a Bonferroni correction and a significance level of  $p < 0.0026$ .

## RESULTS

### PD Survey

#### Demographics and Work Hours

The mean age of PDs was 47.8 years (SD 9.0). Overall, 75% ( $n = 6$ ) of PDs were male. When questioned regarding the perceived number of hours their residents worked per week, 12% ( $n = 1$ ) reported 51 to 60 hours, 25% ( $n = 2$ ) reported 61 to 70 hours, 12% ( $n = 1$ ) reported 71 to 80 hours, and 50% ( $n = 4$ ) reported 81 to 90 hours per week.

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