

# Self-Appraised Readiness of Senior and Graduating General Surgery Residents to Perform Thoracic Surgery

Zachary M. DeBoard, MD,\* Michael Paisley, MD,<sup>†</sup> and Donald D. Thomas, MD<sup>‡</sup>

\*Division of Cardiothoracic Surgery, University of Utah, Salt Lake City, Utah; <sup>†</sup>Department of Surgery, Santa Barbara Cottage Hospital, Santa Barbara, California; and <sup>‡</sup>Division of Cardiothoracic Surgery, Oregon Health & Science University, Portland, Oregon

**OBJECTIVE:** General surgeons perform up to 50% of noncardiac thoracic surgery (TS). Although data show consistent TS case volume during general surgery (GS) residency it is unknown whether this operative trend will persist given potentially limited subspecialty exposure. We sought to determine if certain aspects of residency programs and resident characteristics were associated with trainees' perceived comfort in performing certain basic TS procedures.

**DESIGN:** An anonymous survey was distributed to GS residents regarding program characteristics, presence of a TS residency, and intent to pursue thoracic surgical training, and estimated case volumes of individual procedures. Comfort levels for performing video-assisted thoracoscopic surgical (VATS) procedures, open lobectomy, elective thoracotomy, and sternotomy were attained through a 5-point Likert-type scale.

**SETTING:** This survey was administered at 50 training programs with responses recorded via an online form.

**PARTICIPANTS:** Fourth- and fifth-year GS residents in the United States.

**RESULTS:** Of 272 respondents 58% were fourth-year residents, 62% of residents trained at university-affiliated programs, and 64% reported a TS residency program at their institution and 16% stated intent to pursue TS. Fifth-year residents performed significantly more cases than fourth-year residents despite no difference in median comfort levels. Residents intending to pursue TS performed

significantly more cases and were more comfortable performing a thoracotomy, sternotomy, VATS wedge resection/biopsy, and VATS decortication/pleurodesis ( $p = 0.044, <0.001, 0.045, 0.025$ ). No characteristics were associated with comfort performing a lobectomy via thoracoscopic or open (thoracotomy) approaches.

**CONCLUSION:** Most senior or graduating GS residents state they are comfortable performing certain thoracic procedures with those pursuing additional thoracic surgical training more comfortable overall. No characteristics were associated with comfort performing a lobectomy. These findings may advise residency curriculum design to ensure continued thoracic surgical exposure and recommend against non-fellowship trained surgeons performing a pulmonary lobectomy. (J Surg Ed ■■■■-■■■. ©2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

**KEY WORDS:** thoracic surgery, video-assisted, thoracotomy, resident preparedness, workforce, procedures

**COMPETENCIES:** Practice-Based Learning and Improvement, Patient Care, Systems-Based Practice

## INTRODUCTION

The Accreditation Council for Graduate Medical Education's (ACGME) implementation of the 80-hour workweek restriction for residents has yielded changes within surgical training, namely a curriculum more focused on core general surgery (GS). Additionally, integrated residency programs have potential to further narrow or eliminate exposure to areas such as plastic, vascular, and thoracic surgery (TS). Although recent studies have demonstrated consistent

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*Correspondence:* Inquiries to Zachary M. DeBoard, MD, Division of Cardiothoracic Surgery, University of Utah, 30 North 1900 East, SOM 3C127, Salt Lake City, UT 84132 fax: +(801) 585-3936; e-mail: [zach.deboard@hsc.utah.edu](mailto:zach.deboard@hsc.utah.edu)

**TABLE 1.** Aggregate Survey Responses of Senior GS Residents

	<b>n = (%); median [IQR]</b>
PGY-4	158 (58.1)
PGY-5	114 (41.9)
University-affiliated residency program	170 (62.5)
Presence of TS fellowship or residency	175 (64.3)
Plan to pursue cardiothoracic training	44 (16.2)
Categorical GS residents	
1-20	99 (36.4)
21 or more	173 (63.6)
Timing when TS rotations offered	
None	17 (6.25)
PGY-1 through 3	55 (20.2)
PGY-4 through 5	50 (18.4)
All years	150 (55.1)
Total required months on TS	
None	13 (4.78)
1-2	105 (38.6)
3-4	96 (35.3)
5-6	48 (17.6)
7 or more	10 (3.68)
VATS performed	
1-5	42 (15.4)
6-10	59 (21.7)
11-15	78 (28.7)
16 or more	93 (34.2)
Thoracotomy performed	
None	1 (0.3)
1-5	91 (33.5)
6-10	91 (33.5)
11-15	50 (18.4)
16 or more	39 (14.3)
Sternotomy performed	
None	55 (20.2)
1-5	141 (51.8)
6-10	32 (11.8)
11-15	29 (10.7)
16 or more	15 (5.5)
Comfort performing	
VATS decortication/pleurodesis	4 [3-5]
VATS wedge resection/biopsy	4 [3-5]
VATS lobectomy	2 [1-3]
Open lobectomy	2 [2-4]
Thoracotomy	4 [3-5]
Sternotomy	3 [2-4]

volume for certain basic thoracic procedures, these represent a very minor proportion of cases performed by a trainee to graduate GS residency.<sup>1,2</sup>

As data from practice patterns show a significant volume of noncardiac TS performed by general surgeons it is likely that newly graduated GS residents, depending on the practice situation, may need to perform TS.<sup>3-7</sup> However, it is unknown whether or not GS residency yields appropriate degree of exposure for graduating residents to feel comfortable performing certain TS operations. This study aimed to gauge the self-perceived comfort of senior GS residents performing a variety of TS procedures as well as

identify any training environment characteristics that may be associated with greater procedural comfort or exposure to TS.

## METHODS

We elected to survey 50 allopathic GS programs in the United States. Our Institutional Review Board determined this study exempt from review. A 16-question survey link was emailed to GS residency program directors and coordinators. Program directors and coordinators were requested to disburse the survey link to the current postgraduate year (PGY)-4 and PGY-5 residents. These PGY levels were chosen to evaluate residents with likely prior exposure to TS, established fellowship training plans, and those about to enter the work force.

Residents were queried on their individual and program characteristics as well as their approximate volume of common TS procedures cases a general surgeon may perform. Tube thoracostomy and thoracentesis were not included as these were considered essential components of GS residency and not necessarily unique to TS. Resident self-appraisal of comfort level performing certain operations was evaluated on a 5-point Likert scale with the following answer choices: “very uncomfortable,” “somewhat uncomfortable,” “neutral,” “somewhat comfortable,” and “very comfortable”; these responses were assigned numeric values ranging from 1 through 5, respectively. Data were collected through Google Forms over a 1-month period between May and June 2016. Questions and answer choices used in the survey appear in the appendix.

Residents were excluded from analysis if they had multiple entries or indicated a training level of PGY-3 or lower. Residents from the Santa Barbara Cottage Hospital GS program were excluded due to participation in preliminary versions of the survey.

Data were compiled in a Microsoft (Microsoft Corporation, Redmond, WA) Excel spreadsheet. Respondents were considered “comfortable” performing a procedure if they responded “somewhat comfortable,” and “very comfortable” while “very uncomfortable,” “somewhat uncomfortable,” and “neutral” were considered “uncomfortable.” p Values were generated using Fisher exact and Wilcoxon rank sum tests for 2 group comparisons and ANOVA for comparisons greater than 2. p Values were considered significant if they were  $\leq 0.05$ . Discrete variables are presented as number of respondents and percentage of group while continuous variables (for example, “comfort”) are presented as median and interquartile range (IQR).

## RESULTS

Of the 50 GS residency programs participating, 554 PGY-4 and PGY-5 categorical residents were eligible for survey.

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