# General Surgery Resident Satisfaction on Cardiothoracic Rotations ☆

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**OBJECTIVE:** General surgery residents' exposure to cardiothoracic (CT) surgery rotations has decreased, which may affect resident satisfaction. We surveyed general surgery graduates to assess the relationships among rotation satisfaction, CT disease exposure, rotation length, mentorship, and mistreatment.

**DESIGN:** A survey assessing CT curriculum, exposure, mentorship, and satisfaction was forwarded to general surgery graduates from 17 residency programs. A Wilcoxon rank-sum test was used to assess statistical significance of ordinal level data. Statistical significance was defined as $p < 0.05$.

**SETTING:** This study was conducted at the University of Michigan Health System in Ann Arbor, MI, a tertiary care center.

**PARTICIPANTS:** The survey was sent to approximately 1300 graduates of general surgery residency programs who graduated between the years of 1999 to 2014. A total of 94 responses were completed and received.

**RESULTS:** Receiving adequate exposure to CT procedures and disease management was significantly associated with higher satisfaction ratings for all procedures, particularly thoracotomy incisions ($p < 0.001$), empyemas and pleural effusions ($p < 0.001$), and lung cancer care ($p < 0.001$). The absence of mistreatment and good/very good mentorship were both positively associated with higher reported satisfaction ($p = 0.018$ and $p < 0.001$, respectively). Increased length of time on CT rotation was neither associated with improved levels of satisfaction nor with an improvement in the quality of mentorship.

**CONCLUSION:** Rotation satisfaction is positively associated with procedure exposure, better mentorship, and the absence of mistreatment. Longer rotation length was not associated with satisfaction. Shorter rotations are not detrimental to training if they have focused clinical exposure and invested mentors to maximize resident satisfaction. These specific markers of rotation quality are useful in curricular design. (J Surg Ed 73:95-100. ©2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

**KEY WORDS:** graduate medical education, curriculum design, cardiothoracic surgery, general surgery residents, resident satisfaction, mistreatment

**COMPETENCIES:** Medical Knowledge, Professionalism

## INTRODUCTION

Surgical subspecialty exposure and operative case volume for general surgery residents has decreased in recent years, according to data provided by the Accreditation Council for Graduate Medical Education.[1] The implementation of duty hour restrictions has been implicated as a possible cause of these changes.[2] As a result, a directed curriculum that defines necessary areas of resident education while omitting less relevant content and adhering to duty hour restrictions is required. Despite efforts by the Accreditation Council for Graduate Medical Education and the American Board of Surgery to standardize curricula throughout general surgery residency programs, the experiences of residents nationwide remain highly variable due to discrepancies in the structure, size, and composition of programs.[3-5] It is unclear as to what determines resident satisfaction during specific rotations. Attention to curriculum design and resident satisfaction should be focused on shorter surgical subspecialty rotations (plastic surgery, vascular surgery, cardiothoracic surgery [CTS], etc.) as general surgery residents' exposure to these subspecialties continues

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to decrease with the development and maturation of integrated residencies. Components of a quality subspecialty rotation should be evaluated in terms of procedure exposure, resident satisfaction, and mentorship.

Resident satisfaction with surgery education is influenced by a number of factors, including high-quality mentorship and instruction.[6-8] Unfortunately, it has been suggested that senior faculty may be reluctant to invest in mentoring general surgery residents as exposure to their services becomes reduced.[8] This should be of great concern for surgical subspecialties with post–general surgery fellowships, such as CTS, as mentorship during residency has been shown to influence career choice, development, and preparation of mentees.[9] Increased mentorship has been a noted benefit of integrated surgical training programs and is a suggested focus for future general surgery curriculum reform.[10,11] It is unclear if increased exposure alone correlates with better mentorship and increased resident satisfaction. As CTS exposure during general surgery residency has decreased over the past 2 decades, there has been a concurrent decrease in interest in CT fellowships. Although career interest in surgical subspecialties appears to be driven by factors such as mentorship, rotation length, and procedure exposure,[8,12] it has not been determined how and if these factors affect resident satisfaction within their subspecialty rotations. Optimization of subspecialty rotations separate from the recruitment aspect and will require a structure that maximizes positive factors that affect satisfaction.

We sought to evaluate resident satisfaction on CTS rotations during general surgery residency, as that could help guide the development of other subspecialty general surgery rotations. We hypothesize that resident satisfaction during their CT rotation is related to having a broad curriculum, adequate rotation length, and quality mentorship. This study investigates the experiences of board eligible/certified "non-CT" surgeons while on their CT rotations during general surgery residency. We specifically sought to evaluate the relationship between resident satisfaction and length of rotation, procedure exposure, mentorship, and mistreatment. This study highlights components of the CT rotation that should be focused on during curricular reform. Data could also be used in curricular design of other surgical subspecialty rotations to ensure a beneficial experience for residents.

## MATERIAL AND METHODS

To understand the factors that influence resident satisfaction, we developed and conducted a survey of graduates from accredited U.S. general surgery residency programs from 1999 to 2014. A 19-question survey was forwarded through 254 general surgery coordinators to residency alumni asking about their CT rotations during general surgery residency. Former residents were asked to report on their satisfaction with the CT rotations, exposure to procedures and disease processes, quality of mentorship, and frequency of mistreatment, all on 5-point Likert scales. Specific procedures and disease management skills were chosen from the SCORE curriculum,[4] defining the current CT curriculum for general surgery residents. This survey was presented to and validated by a small focus group (5 recent surgery graduates) to assess survey quality. Participation in the survey was voluntary and anonymous. A completed response was considered as consent to participate.

The surgical coordinators of 254 general surgery residency programs were contacted. The data were cleaned and voided of current residents, which yielded a final sample of 94 respondents. We estimate that the surveys were forwarded to approximately 1300 residents, yielding a response rate of 7.2%. The total number of residents was approximated based on the class size times the number of years surveyed of the 17 programs from which at least a single response was received. Data were analyzed using StataIC 13. Frequency distributions for categorical variables were examined to identify patterns and trends among the graduate respondents. A rank-sum test was used to assess statistical significance between different groups of respondents. Statistical significance was defined as $p < 0.05$. This project has been Institutional Review Board approved (HUM00065709).

## RESULTS

The demographic information of the analyzed respondents is shown in Table 1. Notably, 71% of respondents were

**TABLE 1.** Demographic Information

| | No. | % |
|---|---|---|
| Sex | | |
| Male | 67 | 71 |
| Female | 27 | 29 |
| Year of graduation | | |
| 1999-2004 | 13 | 14 |
| 2005-2009 | 27 | 29 |
| 2010-2014 | 54 | 57 |
| Was fellowship or subspecialty training pursued? | | |
| Yes | 70 | 74 |
| No | 24 | 26 |
| Current practice setting | | |
| Rural | 8 | 9 |
| Urban | 27 | 29 |
| Private practice—hospital employee | 25 | 27 |
| Private practice—independent group/solo practice | 25 | 27 |
| Academic center | 29 | 31 |
| VA/government hospital | 7 | 7 |
| Academic affiliated position (resident/student) | 16 | 17 |
| Locums tenens | 2 | 2 |

VA, Veterans Affairs.