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Graduating general surgery resident operative confidence: perspective from a national survey

Annabelle L. Fonseca, MD, Vikram Reddy, MD, PhD, Walter E. Longo, MD, and Richard J. Gusberg, MD*

Department of Surgery, Yale University School of Medicine, New Haven, Connecticut

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ABSTRACT

Background: General surgical training has changed significantly over the last decade with work hour restrictions, increasing subspecialization, the expanding use of minimally invasive techniques, and nonoperative management for solid organ trauma. Given these changes, this study was undertaken to assess the confidence of graduating general surgery residents in performing open surgical operations and to determine factors associated with increased confidence.

Methods: A survey was developed and sent to general surgery residents nationally. We queried them regarding demographics and program characteristics, asked them to rate their confidence (rated 1–5 on a Likert scale) in performing open surgical procedures and compared those who indicated confidence with those who did not.

Results: We received 653 responses from the fifth year (postgraduate year 5) surgical residents: 69% male, 68% from university programs, and 51% from programs affiliated with a Veterans Affairs hospital; 22% from small programs, 34% from medium programs, and 44% from large programs. Anticipated postresidency operative confidence was 72%. More than 25% of residents reported a lack of confidence in performing eight of the 13 operations they were queried about. Training at a university program, a large program, dedicated research years, future fellowship plans, and training at a program that performed a large percentage of operations laparoscopically was associated with decreased confidence in performing a number of open surgical procedures. Increased surgical volume was associated with increased operative confidence. Confidence in performing open surgery also varied regionally.

Conclusions: Graduating surgical residents indicated a significant lack of confidence in performing a variety of open surgical procedures. This decreased confidence was associated with age, operative volume as well as type, and location of training program. Analyzing and addressing this confidence deficit merits further study.

1. Introduction

General surgery training is undergoing a period of significant change with decreasing work hours, increasing subspecialization, increasing minimally invasive techniques, and decreasing operative management of solid organ trauma. All these changes have significantly impacted residency training, leading to concerns regarding the operative experience and technical training of current surgery residents [1,2].

* *Corresponding author.* Department of Surgery, Yale University School of Medicine, FMB 107, 333 Cedar Street, New Haven, CT 06510. Tel.: +1 862 216 9999; fax: +1 203 737 5209.
E-mail address: annabelle.fonseca@yale.edu (A.L. Fonseca).
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The decrease in the open operative experience of surgery residents is cause for concern. Despite the current increase in minimally invasive techniques, it is still imperative that surgical residents graduate with the technical skill to perform open operations if the need arises, such as in the event of intraoperative complications that cannot be managed safely in a minimally invasive fashion, during exploratory operations for catastrophic intra-abdominal trauma, or when in a particular patient, an open approach is preferable to a minimally invasive one. The decreasing exposure to open operations during residency training may not adequately prepare current surgical residents to deal with surgical problems that require open surgical expertise.

Our study of graduating surgical residents in the Northeast in 2011 indicated a significant lack of confidence in performing a number of open operations and a lack of resident confidence in their ability to practice independently after residency [3]. To further assess this apparent lack of confidence and to evaluate whether this operative experience was restricted to the Northeast or a national phenomenon, we performed the same survey study nationally the following year. These are the first such studies to evaluate the graduating chief residents' operative confidence with regard to specific open surgical procedures and to evaluate resident-related and program-specific variables that are associated with variations in reported confidence.

2. Methods

We developed a 40-question survey to assess the graduating surgical residents' operative confidence when performing a number of open surgical procedures. The survey was developed based on a comprehensive multistage process, as detailed in a prior publication [3]. We used qualitative methods and detailed interviews to develop an initial pool of survey questions. We then subjected this pool of questions to the four stages of pretesting, which consists of review by knowledgeable colleagues, cognitive interviewing, pilot testing, and a final check as described by Dillman [4].

This survey was distributed nationally to a total of 249 programs in June 2012. We contacted Program Directors and Program Coordinators of General Surgery programs individually with a brief explanation of purpose of the study and asked them to distribute the survey to their categorical and nondesignated preliminary surgery residents. All programs complied with this request. After the initial contact with the programs, a reminder was distributed 2 wk later. A total of 7120 surveys were thus distributed; of which, 1102 were distributed to graduating chief (postgraduate year 5 [PGY5]) residents. We did not request any identifying information, and complete anonymity was guaranteed.

We queried residents regarding demographics (age, gender, and postgraduate training year), program characteristics (type of surgical program: university, community, or university-affiliated; program size: small [1–3 residents/y], medium [4–5 residents/y], or large [6+ residents/y]; presence of a simulation laboratory; affiliation to a Veterans Affairs [VA] Hospital; and geographic location of training program), estimated number of operations performed laparoscopically, estimated case volume (estimated number of cases performed both in the last year and through the course of residency training), and professional goals (dedicated research years, future fellowship goals, and future practice plans). We then asked respondents to rate their confidence level in performing a number of open surgical operations. We also asked respondents to list any additional operations, which they felt that they should be confident in performing but were not. In addition, we asked respondents whether they felt confident that they would graduate with the operative skills required to be able to practice independently after residency training.

Survey responses to questions regarding operative confidence ranged from 1 (not confident) to 5 (extremely confident). For the purpose of statistical analysis, responses were divided into "not confident" (not confident, minimally confident, and neutral) and "confident" (confident and extremely confident). To assess for the differences in confidence levels based on individual and program-specific characteristics, we compared the demographics, program-specific variables, estimated case volume, and professional goals of residents who reported being confident at performing the specified procedures with those who did not. Univariable analysis was performed with the *t*-test and one-way analysis of variance for continuous data and Chi-square test for categorical data. Multivariable analysis was then performed with logistic regression to identify independently predictive factors. All variables with a $P < 0.2$ on univariable analysis were entered into a backward stepwise logistic regression model. A $P < 0.05$ was considered statistically significant.

This study was approved by the Yale University Institutional Review Board and Human Investigation Committee.

3. Results

The survey was distributed to and completed by residents in every year of training. For the purpose of this study, we focused on PGY5 residents. This survey was completed by a total of 653 graduating general surgery residents (59% response rate). 69% were males, 68% were from university programs, 51% were from programs affiliated to a VA Hospital, and 96% reported having a simulation laboratory. Demographic and program-specific variables and estimated case volume and professional goals are reported in Table 1. A total of 124 residents (19%) reported a high case volume (>300 cases) in their last year of training. A total of 582 residents (89%) reported a high case volume (>750 cases) during the course of their residency training.

Although almost all PGY5 residents (95%) reported confidence in performing basic laparoscopy, the reported overall confidence for open surgical cases and advanced laparoscopy was only 75% and 57%, respectively. Twenty five percent or more of PGY5 residents reported a lack of confidence in performing eight of the 13 specific general surgery and trauma procedures addressed in the survey (Table 2).

When queried regarding whether they felt confident that they would graduate with the operative skills required to be able to practice independently after residency training, 468 residents (72%) replied in the affirmative; almost one-third, therefore, did not. Factors associated with confidence in postresidency practice included male gender ($P = 0.01$), older