

Fundamentals of Laparoscopic Surgery: Not Only for Senior Residents

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OBJECTIVE: Fundamentals of laparoscopic surgery (FLS) was developed by the Society of American Gastrointestinal and Endoscopic Surgeons to teach the physiology, fundamental knowledge, and technical skills required for basic laparoscopic surgery. We hypothesize that residents are doing more laparoscopic surgery earlier in residency, and therefore would benefit from an earlier assessment of basic laparoscopic skills. Here, we examine FLS test results and ACGME case logs to determine whether it is practical to administer FLS earlier in residency.

DESIGN: FLS test results were reviewed for the 42 residents completing FLS between July 2011 and July 2016. ACGME case logs for current and former residents were reviewed for laparoscopic cases logged by each postgraduate year. Basic and complex laparoscopic cases were determined by ACGME General Surgery Defined Category and Minimums Report. Descriptive statistics were used for analysis.

SETTING: Academic general surgery residency, Washington University in St. Louis School of Medicine.

PARTICIPANTS: Current and former general surgery residents.

RESULTS: A total of 42 residents took and passed FLS between July 2011 and July 2016. All residents successfully passed the FLS knowledge and skills examinations on the first attempt regardless of their postgraduate year (PGY 3n = 13, PGY 4n = 15, and PGY 5n = 14).

Total laparoscopic case volume has increased over time. Residents who graduated in 2012 or 2013 completed 229 laparoscopic cases compared to 267 laparoscopic cases for

those who graduated from 2014 to 2016 ($p = 0.02$). Additionally, current residents completed more laparoscopic cases in the first 2 years of residency than residents who graduated from 2012 to 2016 (median current = 38; former = 22; $p < 0.001$).

Examining laparoscopic case numbers for current residents by PGY demonstrated that the number of total and complex laparoscopic cases increased in each of the first 3 years of residency with the largest increase occurring between the PGY 2 and PGY 3 years. In the PGY 4 and PGY 5 years, most laparoscopic cases were complex.

CONCLUSION: Increased use of laparoscopic surgery has led to a corresponding increase in laparoscopic case volume among general surgery residents. We would advocate for FLS testing to serve as an early assessment of laparoscopic knowledge and skill and should be performed before a significant increase in complex laparoscopic surgery during training. (J Surg Ed ■■■■■. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: fundamentals of laparoscopic surgery, ACGME case log, laparoscopic surgery, general surgery residency

COMPETENCIES: Patient Care, Practice Based Learning

INTRODUCTION

Fundamentals of laparoscopic surgery (FLS) was developed by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) to “teach a standard set of cognitive and psychomotor skills to practitioners of laparoscopic surgery.”¹ The FLS curriculum was released in 2004 with a corresponding knowledge and technical assessment leading to FLS certification. The importance of standardization in training was identified by the American Board of Surgery (ABS), and in 2008, the ABS made passage of FLS a requirement to achieve certification in general surgery.²

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TABLE 1. Distribution of Residents by PGY and FLS Pass Rates

Postgraduate Year	Number	Male (%)	Passed FLS Written (%)	Passed FLS Practical (%)	Lap Cases Completed before FLS (Mean)
PGY 3	13	8 (62%)	13 (100%)	13 (100%)	42
PGY 4	15	9 (60%)	15 (100%)	15 (100%)	107
PGY 5	14	10 (71%)	14 (100%)	14 (100%)	170

To standardize simulation across residency programs, the American College of Surgeons (ACS) and Association of Program Directors in Surgery (APDS) released a national skills curriculum in 2007, which includes modules for open, laparoscopic, and endoscopic skills. The laparoscopic skills are divided into basic and advanced laparoscopic modules, with the FLS suturing tasks falling in the advanced category.³ Based on these recommendations, most programs have developed laparoscopic curricula for their residency programs, with many using a tiered approach where junior residents, postgraduate year (PGY) 1 and PGY 2, learn basic laparoscopic tasks such as camera driving and hand-eye coordination while senior residents, PGY 3 and above, focus on more complex tasks such as laparoscopic suturing.⁴

Although FLS is required by all residents applying for certification in general surgery, no recommendations exist on the timing of FLS testing during residency. We hypothesize that residents would benefit from an earlier assessment of basic laparoscopic knowledge and skills. Here, we examine FLS test results and ACGME case logs from a single institution to determine whether it is practical to administer FLS earlier in residency as well as when it is appropriate to perform FLS testing.

METHODS

Following IRB approval, we examined the written and practical portions of the FLS test results for our residents between July 2011 and July 2016. This time frame was chosen as it captures the period where our FLS testing was transitioned from a PGY 4 and PGY 5 objective to a PGY 3 objective within our training program.

ACGME case logs were reviewed for current and former residents during the noted period. Basic and complex laparoscopic case numbers were collected from the ACGME case log system using the General Surgery Defined Category and Minimums Report.

Data were tested for normality using a Pearson test for normality. Unpaired *t*-tests and one-way analysis of variance (ANOVA) were used to test for differences between 2 of them and multiple normally distributed groups, respectively. Wilcoxon-Mann-Whitney tests were used for comparisons between 2 nonparametric groups, and Kruskal-Wallis tests were used for multiple nonparametric groups. Statistical analysis was performed using GraphPad Prism 7 (La Jolla, CA).

RESULTS

Between July 2011 and July 2016, 42 residents took FLS with a nearly equal distribution of residents among PGY 3, 4, and 5 (PGY 3: 13, PGY 4: 15, and PGY 5: 14). All residents took and passed both the written and the practical portions of the FLS test on the first attempt. We examined the total laparoscopic cases performed before taking FLS and, as expected, PGY 3 residents had completed significantly fewer laparoscopic cases before taking FLS compared to PGY 4 or 5 residents (mean PGY 3: 42 ± 11 , PGY 4: 107 ± 22 , and PGY 5: 170 ± 36 ; $p < 0.0001$) (Table 1). However, this did not affect the ability of PGY 3 residents to gain FLS certification.

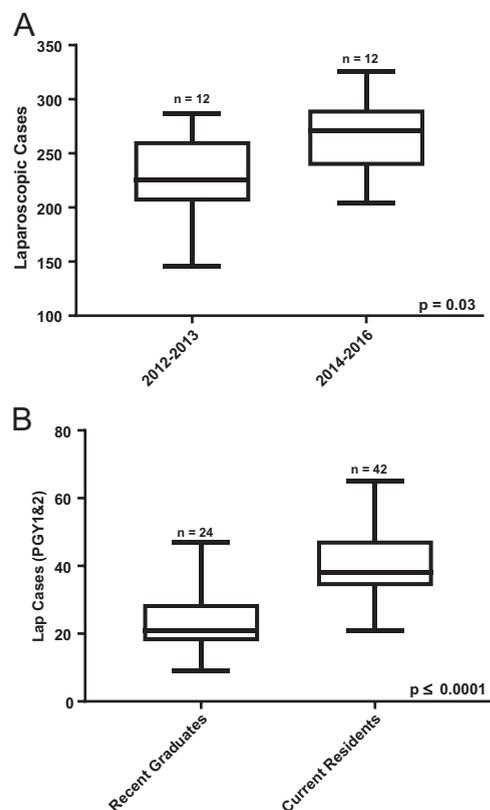


FIGURE 1. (A) Comparison of total laparoscopic cases for residents graduating between 2012 and 2013 and those graduating between 2014 and 2016. (B) Number of laparoscopic cases during the PGY 1 and PGY 2 years comparing graduates from 2012 through 2016 vs current residents.

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