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Resident Operative Experience at Independent Academic Medical Centers—A Comparison to the National Cohort☆

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PURPOSE: Independent Academic Medical Centers (IAMCs) comprise one-third of U.S. general surgery training programs. It is unclear whether IAMCs offer qualitatively or quantitatively different operative experiences than the national cohort. We analyzed a large representative sample of IAMCs to compare operative volume and variety, with a focus on low-volume procedures.

METHODS: Accreditation Council for Graduate Medical Education Program Case Reports from 27 IAMCs were collected and analyzed for 3 academic years (2012-2015). IAMCs were compared to the national cohort for specific defined category volumes and selected low-volume cases. One-sample two-way *t*-tests were calculated comparing IAMC totals to national program averages.

RESULTS: IAMCs had a median of 3 chief residents per year (range: 1-6). IAMCs reported significantly more "total major" procedures in 2013-2014 ($p = 0.046$). Other case totals were statistically similar between IAMCs and the national cohort for "total major", "surgeon chief", "surgeon junior", and "teaching assistant" cases. In 2013-2014, IAMCs reported more laparoscopic complex (138.3 vs. 110.6, $p = 0.010$) and alimentary tract cases (276.5 vs. 253.5, $p = 0.019$). IAMC esophagogastroduodenoscopy case totals were higher in 2013-2014 (55.9 vs. 41, $p = 0.038$) and 2014-2015 (47.8 vs. 41, $p = 0.047$). IAMCs had fewer pancreas cases than the national cohort in all three years by about three cases per resident ($p \leq 0.026$). In 2012-2013 IAMCs reported fewer (by about one) esophagectomy, gastrectomy, and abdominal perineal resections. No differences were observed in the following selected procedures: open common bile duct exploration, inguinal hernia, laparoscopic appendectomy, laparoscopic cholecystectomy, and colonoscopy.

CONCLUSIONS: The IAMCs studied appear to provide equivalent exposure to specific subcategories mandated by the Accreditation Council for Graduate Medical Education and American Board of Surgery. Graduates of IAMCs gain similar operative experience in low-volume, defined categories when compared to the national cohort. Certain specific cases subject to regionalization pressure are less well represented among IAMCs. This has important implications for medical students applying to surgery residency. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

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COMPETENCIES: Professionalism, Systems-Based Practice, Practice-Based Learning and Improvement

INTRODUCTION

Independent Academic Medical Centers (IAMCs) comprise one-third of the 255 U.S. Accreditation Council for Graduate Medical Education (ACGME)-accredited general surgery training programs. They are generally identified as

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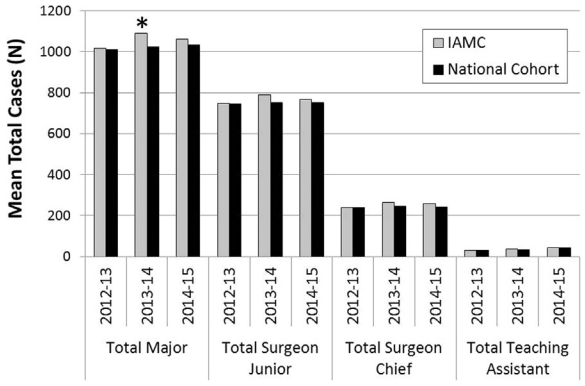

FIGURE 1. Case totals by role: independent programs and national program average.

programs that do not have an on-campus medical school. However, many have medical students from affiliated medical schools. The IAMC Committee of the Association of Program Directors in Surgery has, over the past few years, conducted several studies to better define characteristics of IAMCs. This has included an examination of fellowship choices of IAMC trainees,[1] and characterization of IAMC applicants[2,3] and faculty.[4]

With better definition of outcome measures at IAMCs, applicants to general surgery programs can make more informed decisions about what kinds of programs would suit them. The aim of this study was to compare ACGME case volume at IAMCs to the overall national cohort. We hypothesized that there would be differences in overall case volume, and specific differences in defined categories. We analyzed a large representative sample of IAMCs to compare operative volume and variety, particularly in low-volume procedures.

METHODS

IAMC Program Directors were invited to submit data for this investigation. ACGME program case reports from 27 IAMCs were collected and analyzed for 3 academic years (2012-2015). All programs submitted case-log reports for 2012-2013, and 26 programs contributed data for 2013-2014 and 20142015. Each ACGME-generated program report included aggregate, deidentified data on graduating chief residents' case logs, with benchmarked percentiles compared to the national cohort. These reports were subsequently compared to future case-log minimum requirements, as published by the ACGME for the graduating class of the 2017-2018 academic year.[5]

IAMCs were compared to the national cohort for specific defined category volumes and selected low-volume cases. Two-sided one-sample *t*-tests were calculated comparing IAMC case totals to national program averages and Residency Review Committee (RRC) requirements for the 2017-2018 academic year. One-sample *t*-tests are commonly used to compare characteristics of a sample to a population statistic when the sample is part of the larger population.[6] Total cases were evaluated by designated role and procedure type. Analyses were performed using Stata/SE v.12.1 (StataCorp, College Station, TX). Statistical significance was assessed at the level of $\alpha = 0.05$.

RESULTS

A total of 27 IAMC programs submitted case-log reports and were included in the analysis. IAMCs had a median of 3 chief residents per year (range: 1-6). IAMCs reported more "total major" procedures in 2013-2014 ($p = 0.046$). Other case totals were statistically similar between IAMCs and the national cohort for "total major", "surgeon chief", "surgeon junior", and "teaching assistant" cases (Fig. 1).

In 2013-2014, IAMCs reported more laparoscopic complex and alimentary tract cases (Table 1). IAMC esophagogastroduodenoscopy case totals were higher in 2013-2014 and 2014-2015 (Table 2). IAMCs had fewer pancreas cases than the national cohort in all 3 years by 2 to 3 cases per resident. In 2012-2013, IAMCs reported fewer pediatric procedures, as well as esophagectomy, gastrectomy, and abdominal perineal resections (APRs). However, IAMC totals for those procedures were similar to the national cohort in the following 2 years (Table 3).

No significant differences were observed for other procedure categories. In the most recent year (2014-2015), all IAMC defined category operative case totals were significantly greater than the 20172018 RRC required minimum totals ($p < 0.001$; Fig. 2).

DISCUSSION

The goal of this study was to quantify operative volume and variety in a large representative sample of IAMCs, as compared to the national cohort of residency training programs. We were particularly interested in typically low-volume procedures.

Volume is a key metric for determining whether surgical training programs are meeting their goal of producing well-trained surgeons. The ACGME's requirements for surgery state: "The goal of a surgical residency program is to prepare the resident to function as a qualified practitioner of surgery at the advanced level of performance expected of a board-certified specialist."[7] The ACGME maintains a case-log system for surgical trainees to allow real-time tracking of operative participation. This system further subdivides these procedures into defined categories, with minimum volume expectations. Defined category reports are mandated by the American Board of Surgery (ABS) as part of the application for admissibility to the Qualifying and Certifying examinations. Recently, the ACGME has revised these case-log