The Quality In-Training Initiative: Giving Residents Data to Learn Clinical Effectiveness

Morgan M. Sellers, MD,* Matt Fordham,[†] Craig W. Miller,[†]
Clifford Y. Ko, MD, MS, MSHS, FACS, FASCRS,[†] and Rachel R. Kelz, MD, MSCE, FACS*

*Department of Surgery, Center for Surgery Healthcare and Economics, University of Pennsylvania, Philadelphia, Pennsylvania; and [†]Division of Research and Optimal Patient Care, American College of Surgeons, Chicago, Illinois

BACKGROUND: Training programs are expected to provide clinical outcomes data to residents. Few systems have the necessary infrastructure. We evaluated initial adoption and use of the Quality In-Training Initiative (QITI) platform linking National Surgical Quality Improvement Program (NSQIP) data to trainees.

STUDY DESIGN: Proportions of Accreditation Council for Graduate Medical Education general surgery residency programs with differing levels of NSQIP and QITI affiliation were calculated and program characteristics were compared. All NSQIP sites that captured QITI custom field data from July 2013 to June 2016 were included in case analysis. Differences in case collection were compared between participating (P) sites that actively participated in QITI and nonparticipating (NP) sites that did not. Resident participation by procedure type was examined.

RESULTS: Of 268 accredited general surgery residency programs, 92% ($n = 248$) is affiliated with a NSQIP hospital and 61% of all clinical months is spent at NSQIP sites. For 42% of all programs ($n = 114$), the primary teaching hospital is affiliated with the QITI. In all, 74 P sites and 89 NP sites captured a total of 417,816 cases. The median number of cases captured per site was statistically higher for P sites (3063) compared with NP sites (2307, $p < 0.001$).
A total of 68.3% of all cases captured had resident participation indicated by postgraduate year ($n = 285,469$). The most common procedures with resident participation were laparoscopic appendectomy ($n = 17,082$, 6.0%) and laparoscopic cholecystectomy ($n = 15,502$, 5.4%). Percentage coverage rates ranged from 17.3% to 91.8%.

CONCLUSION: Most general surgery rotations are at NSQIP sites. Identifying resident participation in captured NSQIP cases is feasible on a large scale. Captured cases reflect national case-mix. The platform has the potential to collect data on institutional and program-level variation in resident operative experience that may be used to improve training. (J Surg Ed ∎:∎∎∎-∎∎∎. © 2017 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: QITI, trainee, NSQIP, quality, clinical outcomes research

COMPETENCIES: Medical Knowledge, Patient Care, Practice-Based Learning and Improvement

INTRODUCTION

The introduction of the general surgery milestones by the Accreditation Council for Graduate Medical Education (ACGME) has pushed surgical training programs to develop innovative ways to train and evaluate residents in the 6 core competencies.[1,2] To support the milestones, training programs are now increasingly expected to provide data on clinical efficiency to residents. Few health systems have the infrastructure necessary to track resident-specific outcomes. The American College of Surgeons National Surgical Quality Improvement Program (NSQIP), through the platform developed by the Quality In-Training Initiative (QITI), is positioned to address this gap.

The QITI is a multidisciplinary collaborative of academic affiliates of NSQIP. Since its inception in 2011, the overall goal of the collaborative is to support the dissemination of best practices in surgical education.[3] The QITI has developed a platform leveraging the infrastructure and external

support of NSQIP to gather resident-level patient outcomes data for use in surgical education. In addition to internal feedback to trainees, this platform is now being used to support research. It was used to track resident involvement in surgical cases in the Flexibility in Duty Hour Requirements for Surgical Trainees Trial, and captured outcomes data have been used in both single-institution and multi-institution studies.[4,5]

Given the increasing need for robust resident-level data, our aim was to evaluate the ability of the QITI platform to capture resident participation in NSQIP cases. We performed a descriptive analysis of the institutions participating in NSQIP and QITI, the cases captured by those institutions, and the extent of resident participation as captured by the QITI platform.

MATERIALS AND METHODS

Participants

During a previously described pilot study,[6] QITI sites were taught to link individual cases in the NSQIP database with service team and operative resident, allowing the local creation of resident or service team-based reports of patient outcomes captured in NSQIP. Report generation was subsequently centralized and performed by NSQIP. An additional custom field was added to the QITI protocol to capture resident postgraduate year (PGY). This PGY field was used by QITI member sites as well as all Flexibility in Duty Hour Requirements for Surgical Trainees trial sites to track resident involvement in cases. The QITI custom fields were linked to the principle operative procedure as captured in NSQIP according to existing program and site protocols. If a patient underwent more than one procedure during a single operative encounter, individual sites could choose to collect information on resident participation in those additional or concurrent procedures; this information could then be linked to reports by the local site.

Data Sources

All NSQIP sites that captured QITI custom field data during the study period (July 2013-June 2016) were included. Sites actively participating (P sites) in the QITI were identified as those capturing both individual resident and service team data. Sites that captured only PGY were considered nonparticipating (NP) sites.

A database of all general surgery residency programs along with affiliated training sites and NSQIP participation developed during the residency report pilot study was updated to allow analysis of participating clinical sites and affiliated general surgery residency programs. Updated clinical rotation information was downloaded from the ACGME website, and a list of current NSQIP member institutions was obtained from the American College of

Surgeons. A 6-item online questionnaire with space for free-text responses was sent to all QITI listserv members asking about report generation, with repeat reminder e-mails sent to P sites. Responses were recording using REDCap electronic data capture tools hosted at the University of Pennsylvania.

Data Analysis

Proportions of residency programs with differing levels of NSQIP affiliation were calculated and program characteristics were compared. All cases captured by P and NP sites during the study period were included in case analysis. Differences in case collection between P and NP sites were compared using the Wilcoxon rank sum test. Resident participation per procedure (defined by Current Procedural Terminology [CPT code]) was calculated and ranked. The list of most common procedures with resident participation was compared to the most recent available data for ACGME case logs.[7]

Program and site lists were maintained in Microsoft Access and Microsoft Excel (Microsoft Corporation, 2013). Descriptive statistics were computed using STATA version 12.1 (StataCorp LP, 2011).

This project was discussed with the Institutional Review Board of the University of Pennsylvania. As it does not meet criteria for human subjects research, the project was not required to undergo Institutional Review Board review.

RESULTS

Of the 268 accredited general surgery residency programs, 92% ($n = 248$) have at least 1 clinical rotation at a NSQIP hospital. For 64% ($n = 173$), the primary teaching site is a NSQIP hospital (Table 1). Comparison of characteristics for these programs showed statistically significant differences in size and affiliation, with more programs with NSQIP-affiliated primary teaching sites being university-affiliated and of large or medium size. Furthermore, 42% of all programs ($n = 114$) have primary teaching sites that are affiliated with the QITI as P sites ($n = 57$) or NP sites. Comparison of program characteristics revealed no significant differences in program size, region, and type between these 2 groups. Analysis of the potential for NSQIP to capture resident clinical experience calculated that 74% of all clinical rotation months are spent at NSQIP sites. When weighted by the size of program, the proportion is 61%. For the 173 programs where the primary teaching site is a NSQIP member, the weighted proportion is 83%.

A total of 74 P sites and 89 NP sites captured a total of 417,816 cases (range: 1-9775). The median number of cases captured per site was statistically higher for P sites (3063) compared with NP sites (2307, p < 0.001). Further, 68.3% of all cases captured had resident