

Quality Improvement–Focused Departmental Grand Rounds Reports: A Strategy to Engage General Surgery Residents

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ABSTRACT

Background Many institutions are seeking ways to enhance their surgical trainees' quality improvement (QI) skills.

Objective To educate trainees about the importance of lifelong performance improvement, chief residents at New York Presbyterian Hospital–Weill Cornell Medicine are members of a multidisciplinary QI team tasked with improving surgical outcomes. We describe the process and the results of this effort.

Methods Our analysis used 2 data sources to assess complication rates: the National Surgical Quality Improvement Program (NSQIP) and ECOMP, our own internal complication database. Chief residents met with a multidisciplinary QI team to review complication rates from both data sources. Chief residents performed a case-by-case analysis of complications and a literature search in areas requiring improvement. Based on this information, chief residents met with the multidisciplinary team to select interventions for implementation, and delivered QI-focused grand rounds summarizing the QI process and new interventions.

Results Since 2009, chief residents have presented 16 QI-focused grand rounds. Urinary tract infections (UTIs) and surgical site infections (SSIs) were the most frequently discussed. Interventions to improve UTIs and SSIs were introduced to the department of surgery through these reports in 2011 and 2012. During this time we saw improvement in outcomes as measured by NSQIP odds ratio.

Conclusions Departmental grand rounds are a suitable forum to review NSQIP data and our internal, resident-collected data as a means to engage chief residents in QI improvement, and can serve as a model for other institutions to engage surgery residents in QI projects.

Introduction

Learning how to conduct quality improvement (QI) is a key component of practice-based learning and improvement and part of physicians' socialization to lifelong learning. There are multiple forums at New York Presbyterian Hospital (NYPH)–Weill Cornell Medicine through which surgery residents are able to engage in QI projects to improve surgical outcomes. Residents submit all surgical cases and associated complications to an internal complication database, called "ECOMP," to track surgical outcomes and guide improvement initiatives.¹ Additionally, residents participate in a hospital-wide medical event reporting system and a hospital-wide quality council.

Since 2009, to educate trainees about the importance of lifelong performance improvement, chief residents in our surgical department have been members of a multidisciplinary QI team to improve surgical outcomes. In addition to utilizing ECOMP,

we also participate in the National Surgical Quality Improvement Program (NSQIP) to measure our performance against other hospitals nationwide. NSQIP was created in 1994 to compare the performance of all Veterans Administration (VA) hospitals conducting major surgical procedures. Following successful feasibility studies, NSQIP was then adopted by the American College of Surgeons (ACS) in 2001 to be offered nationwide in the non-VA sector.² NYPH–Weill Cornell Medicine has been participating in NSQIP since 2001.

Utilizing these 2 data sources, chief residents, as part of a multidisciplinary team, identify areas in need of improvement and develop QI initiatives to improve outcomes. Chief residents analyze both sets of data since there is a significant time lag with NSQIP reports, whereas ECOMP data can be obtained at any time of the year. The culmination of these efforts for chief residents is delivering QI-focused reports at department grand rounds to summarize our complication rates and introduce QI initiatives. We describe our process and results as a model for other institutions to engage surgery residents in QI projects

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Editor's Note: The online version of this article contains a figure of a schematic of steps involved in the quality improvement process.

as part of the larger goal of improving surgical outcomes.

Methods

Data Acquisition and Analysis

Two data sources were used to assess our complication rates: NSQIP and ECOMP. NSQIP collects preoperative demographics and comorbidities, operative data, and 30-day postoperative mortality and morbidity outcomes on a systematic sample of patients undergoing major operations in medical centers across the United States. The preoperative data are used to develop prediction models for 30-day postoperative mortality and morbidity. Observed-to-expected (O/E) mortality and morbidity ratios and 90% confidence intervals (CIs) for mortality and 99% CIs for morbidity are calculated. If the lower limit of CI for O/E for a given complication is greater than 1.0, the center is labeled as “needs improvement.” Conversely, if the upper limit of the CI is less than 1.0, the center is labeled as “exemplary.” If the CI includes 1.0, the center is labeled “as expected.” These risk-adjusted outcomes are sent back to medical centers every 6 months as “Semiannual Reports” to facilitate comparison between medical centers.³ All NSQIP-derived data are provided to chief residents without a need for additional computations.

Data calculation from ECOMP was performed entirely by chief residents. Surgery residents entered all surgical cases and associated complications into the ECOMP program through our electronic health record (Epic, Verona, WI). They were instructed to follow NSQIP definitions for urinary tract infections (UTIs) and surgical site infections (SSIs) when logging complications.⁴ Support staff at Epic exported all data entered into ECOMP over the time period of interest into a secure Microsoft Excel (Microsoft Corp, Redmond, WA) file, which was provided to chief residents. The chief resident assigned to deliver the upcoming QI-focused grand rounds was responsible for calculating complication rates. Raw complication rates were calculated by dividing the total number of complications entered by all residents by the total number of cases over the same time period. Chief residents analyzed data over the time period that corresponded with the release of NSQIP Semiannual Reports.

As this was a QI initiative, Institutional Review Board review was not requested.

Data Review

After each semiannual NSQIP report was delivered back to the medical center and ECOMP data were calculated, our administrative education chief resi-

What was known and gap

Surgical residents need to know how to conduct quality improvement initiatives to enhance the quality of care.

What is new

Chief residents analyze data using institutional and national quality databases and report quality improvement interventions at departmental grand rounds.

Limitations

Single specialty, single institution study design precludes clear attribution of quality gains to the intervention.

Bottom line

The initiative has been able to realize quality improvements for urinary tract and surgical site infections, and can serve as a model for other institutions to engage surgery residents in quality improvement projects.

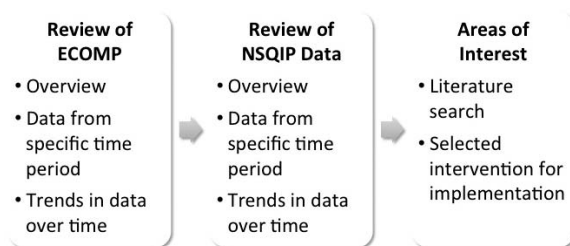
dent and the chief resident assigned to deliver the upcoming QI-focused grand rounds met with a multidisciplinary QI team to review the results. In addition to the 2 chief residents, the multidisciplinary team included the chairman and vice chairman of surgery, the surgery program director, division chiefs as applicable, an internal ACS NSQIP clinical reviewer, and a senior performance improvement specialist. Chief residents did not have prior QI training and worked in conjunction with the multidisciplinary team to identify areas that required further attention. Typically, areas labeled by NSQIP as “needs improvement” were highlighted for discussion.

Intervention

Once an area was identified for further study, the chief residents performed a case-by-case analysis of all complications using the electronic health record. The chief residents also did a literature search to identify strategies for reducing complications and brought the findings back to the multidisciplinary team for discussion and selection of specific interventions. The chief residents estimated that the activities they led, including the analysis of ECOMP data, case-by-case analysis, and literature search, took an estimated 4 weeks to complete. The chief residents undertook these tasks while performing their usual daily clinical responsibilities. There was no additional support for chief residents to conduct these tasks, and no added financial compensation for time spent.

Grand Rounds Reports

The chief residents then developed a QI-focused grand rounds (provided as online supplemental material), using a similar format for each presentation (FIGURE). They began by reviewing NSQIP and ECOMP data, then introduced areas requiring further

**FIGURE**

General Outline of Quality Improvement–Focused Grand Rounds Reports

Abbreviation: NSQIP, National Surgical Quality Improvement Program.

attention by summarizing the literature review, after which they outlined the selected intervention for implementation. Presentations typically lasted 45 minutes, with an additional 15 minutes for questions and discussion. Attendance at weekly grand rounds is mandatory for surgery faculty, residents, and medical students on surgery clerkship. Faculty from other departments, including anesthesiology and gastroenterology, also occasionally attend, but are not specifically invited to the QI-focused grand rounds.

Results

Since 2009, 16 QI-focused reports have been presented at grand rounds on multiple topics. Topics that were highlighted included UTI, SSI, deep vein thrombosis/pulmonary embolism, days on ventilator, length of stay, and readmission rates. UTI and SSI were highlighted in 5 and 6 reports, respectively, and were the most frequently discussed. To provide more detail surrounding our QI process, these 2 areas will be discussed in detail.

SSI and UTI were determined to be in greatest need of improvement because they were consistently labeled by NSQIP as “needs improvement.” Risk factors for UTIs and SSIs, and specific interventions to reduce UTI and SSI rates, were determined from chief residents’ case-by-case analysis and literature search.^{5–20} The TABLE lists examples of risk factors considered for UTIs and SSIs. The interventions implemented to reduce UTIs and SSIs are shown in BOXES 1 and 2, respectively. Many of these interventions represented a change in practice. Residents initiated educational sessions for nursing staff on surgical wards and operating room staff to assist in implementing these models. Interventions to improve UTI and SSI odds ratio were first introduced to the entire department by chief residents in 2011 and 2012, respectively.

The NSQIP UTI odds ratio for general/vascular surgery patients from January 2010 to December 2010 was 1.91 (“needs improvement”). After imple-

menting the interventions listed in BOX 1, the NSQIP UTI odds ratio decreased to 1.27 (“as expected”) from January 2014 to December 2014.

The NSQIP SSI odds ratio for general/vascular from January 2011 to December 2011 was 1.47 (“needs improvement”). After implementation of practice changes listed in BOX 2, the NSQIP SSI odds ratio for general/vascular patients from January 2014 to December 2014 was 1.22 (“as expected”).

Discussion

We present an innovative method for engaging surgery chief residents in QI projects. Chief residents are given the opportunity to engage with the leadership in the NYPH–Weill Cornell Medicine Department of Surgery and Division of Quality and Patient Safety to analyze NSQIP and ECOMP data. They learn how to use literature to guide selection of interventions to be implemented to improve patient outcomes. Finally, these efforts culminate in the delivery of a QI-focused grand rounds report to surgery faculty, peers, and medical students. This is almost always their first opportunity to deliver grand rounds and represents a critical moment in their career development.

The results presented here show an improvement in both UTI and SSI odds ratio from “needs improvement” to “as expected” as labeled by NSQIP. There is still opportunity for improvement. While other studies have shown how centers utilize NSQIP to improve outcomes,^{13,21} our study is unique in that it provides a model for incorporating chief residents in QI. NSQIP data have been extensively studied and are considered to be superior to administrative databases such as ECOMP. However, the reporting of NSQIP data lags behind “real time” findings due to the extensive analysis required. This complicates the evaluation of QI interventions. By having chief residents involved in the QI process, we are able to analyze not only NSQIP data, but also our internal data. ECOMP data can be obtained at any time and allow rapid identification of quality problems. Furthermore, we can more reliably correlate any

TABLE

Examples of Risk Factors for Urinary Tract Infection (UTI) and Surgical Site Infection (SSI) Determined by Quality Improvement Involving Chief Residents

UTI Risk Factors	SSI Risk Factors
Insertion technique	Perioperative antibiotic selection
Comorbidities	Intraoperative
Duration of foley	Wound classification
Foley reinsertion	Comorbidities

Box 1 Examples of Quality Improvement Initiatives Involving Chief Residents to Reduce Urinary Tract Infections

- Identification of appropriate procedures that require urinary catheter
- Routine instruction to residents and medical students on sterile catheter insertion
- Catheter removal on postoperative day 1 or as soon as possible, irrespective of whether the patient has an epidural or underwent pelvic surgery
- Catheter allowed to stay longer in patients with prostatic hypertrophy, difficult or traumatic catheterization, hemodynamic instability
- Hospital-wide protocol for management of acute urinary retention (eg, void trial, bladder scans, straight catheterization)

Box 2 Examples of Quality Improvement Initiatives Involving Chief Residents to Reduce Surgical Site Infections

- Warming operating room to 75 to 80°F prior to patient arrival
- Appropriate selection, timing, and discontinuation of prophylactic antibiotics
- Appropriate hair removal according to Surgical Care Improvement Project guidelines
- Skin preparation with chlorhexidine unless contraindicated
- Routine use of wound protector
- Routine wound irrigation prior to closing skin

changes in surgical outcomes with QI interventions. These 2 data sets complement each other well.

Limitations of our intervention are that, while we observed improvement in UTI and SSI rates, we cannot conclude that this is attributable to the implementation of our QI-focused grand rounds. In addition, it is difficult to quantify improvement in resident education based on incorporating these reports during grand rounds.

This QI process has been important in improving surgical outcomes by contributing to the adoption of proven QI interventions across the entire department. Subsequent QI-focused reports will have to determine shortcomings of these interventions and strategies for improvement. We also think the chief residents have gained important insight into the QI process. At the inception of QI-focused grand rounds, 1 to 2 chief residents presented 1 report each per academic year. After favorable feedback from faculty and residents, 3 chief residents have each presented 1 report per year as part of the grand rounds schedule. Further research is warranted to characterize the benefits to chief residents from participation in this program. Additionally, although surgery faculty, residents, and medical students are only passively exposed to these reports as audience members, we hypothesize that they too derive benefit. This also represents an area for further research.

Other variations that we considered to engage residents in this QI process were to create an additional administrative quality chief resident or to involve only residents who are actively engaged in QI research. Another option to increase resources available to surgery residents might be to partner with outside groups interested in this work, specifically the Association of American Medical Colleges Aligning and Educating for Quality initiative.²²

Conclusion

We conclude that departmental QI-focused grand rounds are a suitable forum to review NSQIP data, and our own internal, resident-collected data are a means to engage chief residents in QI initiatives. We hope other institutions may use our experience as a model for engaging surgery residents in QI programs in the context of the larger mission to improve surgical outcomes.

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