Using Surgeon-Specific Outcome Reports and Positive Deviance for Continuous Quality Improvement

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Background. **Using the thoracic morbidity and mortality classification to document all postoperative adverse events between October 2012 and February 2014, we created surgeon-specific outcome reports (SSORs) to promote self-assessment and to implement a divisional continuous quality improvement (CQI) program, on the construct of positive deviance, to improve individual surgeon's clinical performance.**

Methods. **Mixed-methods study within a division of six thoracic surgeons, involving (1) development of real-time, Web-based, risk-adjusted SSORs; (2) implementation of CQI seminars (n = 6; September 2013 to June 2014) for evaluation of results, collegial discussion on quality improvement based on identification of positive outliers, and selection of quality indicators for future discussion; and (3) in-person interviews to identify facilitators and barriers to using SSORs and CQI. Interview transcripts were analyzed using thematic analysis.**

Results. **Interviews revealed enthusiastic support for SSORs as a means to improve patient care through awareness of personal outcomes with blinded divisional comparison for similar operations and diseases, and apply the learning objectives to continuous professional development and maintenance of certification. Perceived limitations of SSORs included difficulty measuring surgeon expertise, limited understanding of risk adjustment, resistance to change, and belief that knowledge of sensitive data could lead to punitive actions. All surgeons believed CQI seminars led to collegial discussions, whereas perceived limitations included quorum participation and failing to circle back on actionable items.**

Conclusions. **Real-time performance feedback using SSORs can motivate surgeons to improve their practice, and CQI seminars offer the opportunity to review and interpret results and address issues in a supportive environment. Whether SSORs and CQI can lead to improvements in rates of postoperative adverse events is a matter of ongoing research.**

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The rate of postoperative adverse events (AEs) is often used to evaluate both the effectiveness of treatment and the quality of surgical care. The selection of patients for operation, patient factors, disease factors, and surgical expertise are all important considerations for AEs. These are serious considerations as the occurrence of postoperative AEs has been directly linked to mortality [1], hospital length of stay [2], and postoperative quality of life [3]. There is also evidence demonstrating that postoperative AEs affect the overall costs and resource utilization in major surgery [2]. Postoperative AEs are a major influence on both clinical and economic outcomes of surgical care, and methodologies to better categorize, report, and monitor their incidence are essential for ongoing efforts to minimize their occurrence and impact [4]. It is the responsibility of the surgeon to be diligent in reporting, assessing, and improving the quality of surgical care delivered at all times.

A number of strategies have been advocated to promote improvement in the quality of care, including performance measurement and feedback, and positive deviance (PD) and dissemination of best practice measures. Specifically, performance measurement and feedback are increasingly being used as a strategy to provide surgeons with benchmarking information to use for individual quality improvement [5]. Performance measurement and feedback are intended to increase accountability and enhance clinical performance, and thereby improve the quality of care [6]. However, lack of transparent, systematic, data-driven performance measurement and feedback mechanisms for surgeons has

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been considered to be an impediment in fully adopting this strategy.

The concept of PD originated in international public health initiatives and was based on the observation that in most communities, there were individual persons and groups whose uncommon practices produce better outcomes than their peers [7]. The PD approach has recently been used to improve quality of healthcare delivery in a number of settings [8, 9]. To date, no studies have used the approach of PD as means to promote improvement in surgical quality.

Using the thoracic morbidity and mortality (TM&M) classification of AEs [10], the objectives of this study were threefold. First, to create risk-adjusted surgeon-specific outcome reports (SSORs) to enable individualized performance measurement and feedback. Second, to implement a divisionally focused, continuous quality improvement (CQI) program, based on the approach of PD, to review results, select procedures and outcomes in need of improvement, and discuss quality improvement strategies based on identification of positive outliers along with best practice measures. Third, to understand surgeons' perceptions, including the benefits and limitations, on the use of SSORs and a CQI/PD program, as a means for surgeons to actively participate in assessment of their performance.

Material and Methods

Study Design

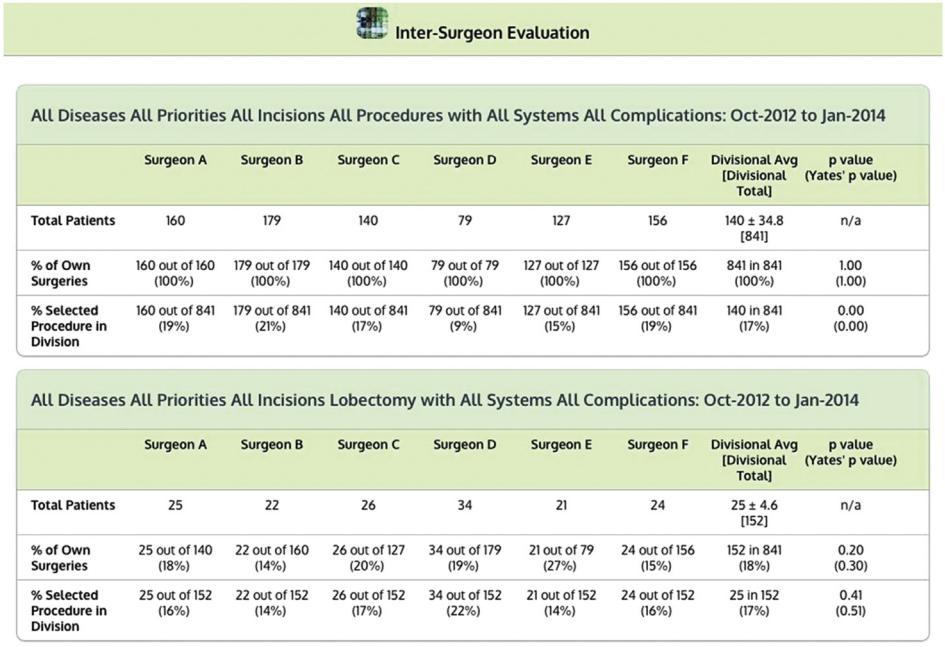
We performed a mixed-methods study within a division of six thoracic surgeons (Division of Thoracic Surgery, The Ottawa Hospital, Ottawa, Canada) involving (1) development of real-time, Web-based, risk-adjusted SSORs; (2) implementation of CQI/PD seminars (n = 6; September 2013 to June 2014); and (3) confidential interviews to identify facilitators and barriers of using SSORs and CQI/PD. The study was approved by The Ottawa Hospital Research Ethics Board.

The TM&M Classification System of Postoperative AEs

The TM&M classification system is a prospective inhospital database that provides a summary of the absolute rate of postoperative AEs and quantifies their severity. The TM&M system was developed according to the Clavien-Dindo classification schema of postoperative AEs [11]. The process for TM&M data collection has been previously described [10]. The process has been facilitated by a point-of-care, iPad-optimized software application (https://ottawatmm.org/).

Volume Report, Complication Report, and Surgeon-Specific Outcomes Reports (SSORs)

The software application was derived from the TM&M classification of AEs based on data from thoracic surgical patients who underwent surgery at The Ottawa Hospital between October 1, 2012 and February 28, 2014, spanning a 16-month period. The software application comprises three reports, including a divisional volume report, a divisional outcomes report, and a SSOR, all created to be dynamic, interactive, and anonymous. Surgeons can filter the results by selecting a specific time period, procedure, surgical approach/incision, and the postoperative complication(s) of interest, including the severity of the complication, as well as the organ system affected (Figs 1 and 2). Throughout both the volume and the outcomes report, a χ^2 test, along with the Yates' correction, were added to identify significant



Inter-Surgeon Evaluation

All Diseases All Priorities All Incisions All Procedures with All Systems All Complications: Oct-2012 to Jan-2014

	Surgeon A	Surgeon B	Surgeon C	Surgeon D	Surgeon E	Surgeon F	Divisional Avg [Divisional Total]	p value (Yates' p value)
Total Patients	160	179	140	79	127	156	140 ± 34.8 [841]	n/a
% of Own Surgeries	160 out of 160 (100%)	179 out of 179 (100%)	140 out of 140 (100%)	79 out of 79 (100%)	127 out of 127 (100%)	156 out of 156 (100%)	841 in 841 (100%)	1.00 (1.00)
% Selected Procedure in Division	160 out of 841 (19%)	179 out of 841 (21%)	140 out of 841 (17%)	79 out of 841 (9%)	127 out of 841 (15%)	156 out of 841 (19%)	140 in 841 (17%)	0.00 (0.00)

All Diseases All Priorities All Incisions Lobectomy with All Systems All Complications: Oct-2012 to Jan-2014

	Surgeon A	Surgeon B	Surgeon C	Surgeon D	Surgeon E	Surgeon F	Divisional Avg [Divisional Total]	p value (Yates' p value)
Total Patients	25	22	26	34	21	24	25 ± 4.6 [152]	n/a
% of Own Surgeries	25 out of 140 (18%)	22 out of 160 (14%)	26 out of 127 (20%)	34 out of 179 (19%)	21 out of 79 (27%)	24 out of 156 (15%)	152 in 841 (18%)	0.20 (0.30)
% Selected Procedure in Division	25 out of 152 (16%)	22 out of 152 (14%)	26 out of 152 (17%)	34 out of 152 (22%)	21 out of 152 (14%)	24 out of 152 (16%)	25 in 152 (17%)	0.41 (0.51)

Fig 1. Surgeon-specific volumes of all procedures (upper panel) and lobectomies (lower panel) performed since October 2012. (Avg = average.)