Intersurgeon comparison of quality of surgical care by a positive deviance method

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Introduction

There is growing attention regarding quality of surgical care. An established quality improvement (QI) strategy for thoracic surgery implemented at The Ottawa Hospital (TOH) is the positive deviance (PD) approach. PD is based on the principle that the uncommon beneficial health behaviours of certain individuals enable them to attain greater success than their peers. The indicators of success in quality of surgical care have been identified to be hospital length of stay (LOS), operating time, readmission rates, and complication rates. These indicators are determined based on the Clavien-Dindo classification scheme and are indicators integrated into TOH’s TM&M (Thoracic Morbidity and Mortality) system [1].

However, in order to implement the PD method and enable intersurgeon comparison, success rates must be risk-adjusted on pre-operative variables. This study aims to review the implementation of the PD approach of QI in a healthcare setting and provide individualized and risk-adjusted feedback to surgeons, in order to improve quality of surgical care. This includes an analysis of previous implementations of PD in the context of Canadian healthcare as well as a summarization of patient demographics and other pre-operative variables for patients undergoing major pulmonary resection surgeries in 2013.

Methodology

Data was collected from patient records of 258 patients having undergone a major pulmonary resection surgery between October 2012 and January 2014. Data collected pertained to patient demographics, BMI, ASA class, smoking status, pulmonary function test results, and various other pre-operative variables, using the TOH’s Thoracic Morbidity and Mortality (TM&M) system.

A literature review was conducted of PubMed for references relating to implementation of a PD method in healthcare. MESH headings included: Humans, quality of health care, quality improvement, interventional studies, risk assessment, health care-associated infections, infection control, general surgery, hospital mortality, length of stay, incidence, and hygiene.

Literature Review – PD

In the context of healthcare, positive deviance (PD) is a method for quality improvement based on the dissemination of knowledge and strategies between “positive deviants” to their peers. These so-called positive deviants are identified based on their greater success rates due to uncommon practices which have enabled them to be more successful than their peers. With successful employment of collaborative interventions, the practices of these positive deviants can be implemented with the aim of improving standards of health care. There are several instances of successful implementation of PD in literature for improving surgical site infection rates, improving hand hygiene compliance rates, reducing rates of myocardial infarction, and improving pregnancy outcomes. Lindberg et al., for example, successfully used a PD method to decrease the incidence of access-related blood stream infections (AR-BSIs) from 2.04 per 100 patients to 0.24 in US outpatient hemodialysis centres [2].

Successful implementation of a PD method entails collaborative interventions where the best medical practices can be discussed. These helpful practices must also be quantitatively verified through risk-adjusted data to have greater success rates. However, the PD method relies often on innovation and changing long-standing patterns of healthcare behaviour, which is a complex challenge. This unconventional orientation for healthcare depends on the understanding of healthcare professionals that organizational processes are not free of uncertainty.

The Division of Thoracic Surgery at TOH intends to employ the PD approach to improve surgical outcomes through the collection and analysis of pre-operative and intra-operative variables in the TM&M system. A literature review of the TM&M system which sent a 31-item questionnaire to all members of the Canadian Association of Thoracic Surgeons assessed that all kappa statistics of inter-rater agreement indicated at least substantial agreement (87.0% indicated almost perfect agreement) and that the TM&M system was regarded as straightforward (98% of respondents), reproducible (94%) and useful (98%). [3]

Results

- Certain important trends emerge between the magnitude of the pulmonary resection surgery (wedge being the smallest, pneumonectomy being the largest) and operative factors.
- In Table 2, generally complication rates, OR times, LOS, and readmission rates tend to increase from left to right (with the exception of pneumonectomies in multiple cases).
- These factors must be risk-adjusted, however, with respect to the pre-operative variables summarized in Table 1.

Conclusions

The PD method has proven to be a successful intervention for improvement of quality of healthcare and can be quantitatively applied in the evaluation of surgical care in the Department of Thoracic Surgery through the continuous monitoring of post-operative complications. Risk-adjustment of these variables is done successfully through a summary of pre-operative variables of patients.

Going forward, it is hoped that these pre-operative variables can be inputted in equations to provide automatic risk-adjusted feedback and success rates to surgeons and that this approach can also be applied to the setting of thoracic surgery to reduce the number of post-operative adverse events.

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Table 1 - Summary of demographics and pre-operative risk factors for five major pulmonary resection surgeries (n=258)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Wedge Resection</th>
<th>Segmentectomy</th>
<th>Lobectomy</th>
<th>Extended Lobectomy</th>
<th>Pneumonectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>[total 80 pts]</td>
<td>[total 15 pts]</td>
<td>[total 144 pts]</td>
<td>[total 7 pts]</td>
<td>[total 12 pts]</td>
</tr>
</tbody>
</table>

Table 2 – Complication rates and operative factors for five major pulmonary resection surgeries (n=279)


References