Complications from unintended harm adversely affect patients and their families while increasing institutional health care costs. In June 2009, a White Paper released by the Society of Acting estimates that post-operative complications are one of the five most expensive complications related to medical error, amounting $154,500 in excess costs per case. Although the World Health Organization (WHO) checklist has been used globally to reduce post-operative mortality and morbidity, no formal study has used an evidence-based, standardized surgical outcomes database to validate. This checklist is a powerful and innovative tool that will facilitate effective communication and teamwork. Surgical team training has demonstrated the opportunity for stakeholders to professionally engage one another through leveling of the authority gradient to prevent patient harm.1,4,9

The Association of peri-Operative Registered Nurses (AORN) Comprehensive Surgical Checklist released in April 2010 incorporates national and local protocol. This document compartmentalizes needed information to facilitate documentation throughout the perioperative process. Attention comparable to the checklist improves patient 30-day mortality by directing the surgical team to focus on the Surgical Care Improvement Project (SCIP) core measures, the Time-Out, and the National Patient Safety Goals. As only one of its Connecticut hospitals using the NSQIP; we determined the positive impact of checklist use in 2010-2011 Saint Francis Hospital and Medical Center 30-day mortality.

Methods

This is a prospective cohort design with historical controls. Prior to implementation of the standardized protocol using pre-operative briefing and post-operative debriefing checklists, surgical services staff participated in a team-based training program. The three 60-minute team training sessions were conducted by internal nurses and anesthesiologist and professional development staff based on the book Crucial Conversations: Tools for Taking Effect States Are High. Participants were oriented to the use of the AORN Comprehensive Surgical Checklist and barriers to checklist use were discussed at the third team training session. Following the initial team training session, utilization of the AORN Comprehensive Surgical Checklist was introduced. Eligible cases included specific high risk procedures selected from those analyzed for NSQIP. Of this sample, elective scheduled cases were examined on the availability of observers. Trained observers remained present for the full duration of study cases to assess the checklist completion and utilization. Observers also collected additional data regarding the number of circulating nurse units during the case, the nature of peri-operative communication and any safety concerns/events. Statistical analysis was completed on SPSS, version 18.0. Patient demographics, case characteristics, and mortality were assessed using chi square and t test. Operating room and circulating nurse units were assessed with two tailed tests (t-bivariate comparisons).

Results

Table 1: Comparison of 30-day mortality between historical control, cases without checklist use and cases with checklist use

<table>
<thead>
<tr>
<th>Procedure Types</th>
<th>Present</th>
<th>Absent</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time in Operating Room (min)</td>
<td>145.54±80.57</td>
<td>144.75±80.30</td>
<td>0.735</td>
</tr>
<tr>
<td>Transfusion</td>
<td>56.2</td>
<td>14.3±8.1</td>
<td>0.032</td>
</tr>
<tr>
<td>Major Morbidity</td>
<td>100.0%</td>
<td>100.0%</td>
<td>0.000</td>
</tr>
<tr>
<td>Minor Morbidity</td>
<td>56.2</td>
<td>14.3±8.1</td>
<td>0.032</td>
</tr>
<tr>
<td>Surgical Site Infection</td>
<td>11.5±6.4</td>
<td>5.0±4.6</td>
<td>0.053</td>
</tr>
<tr>
<td>Incidence Rate</td>
<td>95.0% (51)</td>
<td>87.0% (47)</td>
<td>0.387</td>
</tr>
</tbody>
</table>

Conclusions

The utilization of a comprehensive surgical safety checklist and the implementation of a structured team training curriculum produced a measurable and statistically significant decrease in 30-day morbidity. Furthermore, utilization of specific checklist items can be correlated with decreased morbidity rates. The team training introduced the concept of a safety checklist. Despite limited instruction, compliance with the checklist was 72.7% with most individual component completion rates greater than 90%. This suggests that adoption of a comprehensive checklist is feasible with minimal intervention and can produce measurable improvements in patient outcomes. When compared with historical controls, cases with checklist utilization showed a small reduction in time in the OR. Lower frequencies of circulating nurse units from the OR during cases with correlated with decreased rates of morbidity that achieve statistical significance.

Several study limitations temper the strength of these findings. Although utilization of the NSQIP database provided a robust historical control population of 3079 cases, the small number of cases with checklist utilization and observation hindered identification of trends in mortality rates and reduced the likelihood of establishing statistically significant relationships. The presence of trained observers during cases with checklists may have influenced the actions of peri-operative staff and contributed to some of the improvements reflected in 30-day morbidity reduction. Team training sessions did not capture all members of the peri-operative team. This may have undermined the new communication dynamics other staff tried to establish utilizing the team training curriculum.

Based on the results of this initial study, future research efforts will focus on assessment of qualitative measures of patient safety across the peri-operative spectrum and changes in morbidity rates with more frequent checklist use. Next steps involve analysis of qualitative data as well as correlating observed behaviors with measurable outcomes. Further investigations may include an epidemiologic assessment of OR safety attitudes and communication based on focused groups and semi-structured interviews. The pilot data presented in this study will be used to support the universal adoption of a surgical safety checklist. Following adoption of a peri-operative checklist, NSQIP data will be re-examined to determine if other statistically significant relationships are identified with a larger sample size. Ongoing interventions associated with the development of a follow-up team training curriculum.

Reinforcement of communication strategies will be achieved via adherence to the medical staff authoritative code of conduct. Finally, changes in safety attitudes and perception of the institutional culture of safety will be assessed. This multidimensional strategy of intervention and reflective analysis of both patient outcomes and team member perception will lead to an improvement in our institution’s culture of safety.

References