Reoperative Cardiac Surgeries: The Inception of an Institutional Database

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Reoperative Cardiac Surgeries: The Inception of an Institutional Database
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Introduction
In an effort to compile information regarding cardiothoracic surgery on an international scale, the Society of Thoracic Surgeons (STS) began the STS National Database in 1989 (Shahian et al., 2013). This project served as a stepping-stone towards providing data for clinical research that would surface any overlooked complications and generate concrete evidence for improving the quality of surgeries and patient outcomes (Edwards, Clark, & Schwartz, 1994). The Cardiothoracic Department within LVHN contains an extensive history of cases that, if correctly compiled, may provide key insight into readmitted-patient risk factors associated with specific operations which could improve patient stratification and overall surgeon management.

Methods & Materials
Upon literature review of reoperative cardiac surgeries, a hybridized microcomputer database was constructed with Microsoft Access (Friedrichsen, 2010). The design was specialized to capture important information that could be conveniently extracted from given patient records. Presently LVHN has records of redo patients from the Cedar Crest and Muhlenberg campuses, and this project constructed the first version of the database and recorded information from 2009 and 2010 with a resultant sample size of 122 patients. Thus far, the database captures patient medical and surgical histories reoperation itself, and the Postoperative outcomes.

Results

![Figure 1. Classification of Operations](image1)

Procedures were categorized in order to enter data efficiently.

![Figure 2. Database Characteristics](image2)

Data was drawn from the information currently present in the microcomputer database. Mortality rates are examined in order to determine the frequent probability of patient death in reoperative cardiac surgeries.

<table>
<thead>
<tr>
<th>Characteristics of Sample Pool</th>
<th>Demographics</th>
<th>Average Weight (kg)</th>
<th>Average Height (cm)</th>
<th>Morality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td><strong>N</strong></td>
<td><strong>Age Range</strong></td>
<td><strong>Male</strong></td>
<td><strong>Female</strong></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>78</td>
<td>33-88</td>
<td>90.3 ± 20.4</td>
<td>183.4 ± 53.9</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>44</td>
<td>29-88</td>
<td>73.1 ± 21.4</td>
<td>169.2 ± 41.5</td>
</tr>
<tr>
<td><strong>Original Operations</strong></td>
<td><strong>CABG</strong></td>
<td><strong>Valve</strong></td>
<td><strong>CABG &amp; Valve</strong></td>
<td><strong>Other</strong></td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>17/44 (38.64%)</td>
<td>10/44 (22.72%)</td>
<td>11/44 (25%)</td>
<td>3/44 (6.82%)</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>49/78 (62.82%)</td>
<td>16/78 (20.51%)</td>
<td>5/78 (6.41%)</td>
<td>6/78 (7.69%)</td>
</tr>
</tbody>
</table>

![Figure 3. Postoperative Outcome Differences Between Genders](image3)

Postoperative Outcomes were recorded and stratified by gender. The underrepresented category "ventilator-dependent respiratory insufficiency" was a common theme in unsuccessful reoperations.

Conclusions
Creating a database of this institutional caliber has, thus far, proven to be an indispensable tool for efficiently harvesting retrospective data and utilizing mathematical modeling to identify odds and trends. Beginning this new research with a mature Database will accelerate the process for compiling data and, once the patient sample size is sufficiently large, generate meaningful statistics. Differences in ratios between categorical variables can then be tested for using a two-tailed Fischer’s Exact Test with a Contingency Table to determine significance (Breglio et al., 2013).

Future Work
Further classification may be necessary so as to not generalize findings or establish conclusions prematurely. The relationship function within Microsoft Access would allow for this type of intricate analysis. Additionally, further database form renovation may be necessary once medical records start transcribing recently developed procedures, such as the transcatheter aortic valve replacement (TAVR) (Shahian et al., 2013). This may make the institutional database a great tool for analyzing this new procedure once enough cases have been recorded. The database would already be established, and the data analysis can be performed and reported relatively quickly, putting the Lehigh Valley Health Network at the forefront of research in the TAVR procedure.

References


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