Vascular Surgery Final Report
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IOE 481, Hospital & Operations Management

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Executive Summary

The purpose of this report is to devise a methodology and to produce a cost analysis on the two different types of surgical Abdominal Aortic Aneurysm (AAA) repairs. The first is a conventional method (control) of open surgical repair, and the second is an experimental method of endovascular surgery (sample). This study was conducted to determine whether or not the new procedure has the potential to reduce the cost incurred, by hospitals that perform vascular surgeries.

The inclusion criteria for patients in the sample and control groups are:

- the aneurysm must be infra-renal and greater than 4 cm long
- they must be an acceptable candidate for the control surgery

The exclusion criteria are: (a few are listed below)

- ruptured abdominal aortic aneurysm
- life expectancy less than 1 year
- previous stint or investigational device
- various dimensional criteria

The data used for this study were collected over the period of July 1994 to December 1997. Our true sample size, for patients meeting all criteria of the new procedure (sample group), was one. However due to lack of sufficient data we included 2 compassion cases. There were 42 conventional cases for our control group. Below is a table (Table 1) that shows length of stay (LOS) for each sample patient and the average conventional AAA. The data shows that patients who had the conventional surgery stayed in the hospital for 4.3 days longer than the patients who had the sample procedure. Patient 3 had the highest cost because his surgery was delayed several months. As a result, his imaging was performed twice to ensure that the aneurysm dimensions were still within the given specifications. The cost was over double the average imaging cost for the other two experimental patients. When the imaging cost of $7,348.00 is divided by 2 and is subtracted from the total cost, the new cost is $9,728.50 which indicates the beginning of a learning curve.

<table>
<thead>
<tr>
<th>Table 1.</th>
<th>Total Cost</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person 1</td>
<td>11,473</td>
<td>7</td>
</tr>
<tr>
<td>Person 2</td>
<td>9,277</td>
<td>6</td>
</tr>
<tr>
<td>Person 3</td>
<td>13,402*</td>
<td>7</td>
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<tr>
<td>Sample Average</td>
<td>10,159.50</td>
<td>6.67</td>
</tr>
<tr>
<td>Control Average</td>
<td>11,462</td>
<td>11</td>
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</tbody>
</table>

* The value used for Person 3 in the Sample Average was 9,728.50 which was the recalculated cost for imaging.
Of all the services performed on patients, 18 major clinical groups were identified. The clinical groupings with the highest costs (General Imaging, Nursing ICU, Nursing Surgical, Pharmacy, and Surgical Services OR) were separated and evaluated, and various trends were examined. The highest costing group was General Imaging. This was an expected result because of the detailed nature of the surgery. The Nursing ICU and Pharmacy exhibited the beginning of a learning curve for the endovascular patients.

It must be noted that this analysis is incomplete in that it only evaluates the cost factors of the new surgery. It does not include the clinical outcomes such as patient comfort level, mortality rate, and re-occurrence of aneurysm.

Recommendations:
- Wait for further surgeries to take place, because current information is inconclusive.
- Make it a priority to continue the study, because it appears to be beneficial for all parties involved.
- Hospital should advertise they are the first in the state to perform the endovascular surgery in order to attract patients into study.
the United States is prone to many diseases. These can happen anywhere in the arterial walls. This can happen anywhere in patients, the aorta is the major vessel to become blood vessel carrying blood from the heart to aneurysms located below the kidney and just femoral arteries. The conventional surgery which a large incision is made in the abdomen. An aortic incision is made in the abdomen to "open" it. A graft is then inserted into the aorta. The sample surgery stems from new incision is made in each leg. A guide wire is try to the aneurysm site and an expandable he graft expands to fit the aneurysm once it been observed that patients who undergo this very than patients who undergo the traditional vascular surgery aims to lower trauma to the length of stay for the patient, and reduces the is well as the patient.

levise a methodology and to produce a cost of surgical abdominal aortic aneurysm repairs.

1 Hospital Billing, Finance (Sandy Regiani), Nurses (Becky Bertha Elaine ****), Doctor Charles Shanley. They assisted in essary for costing vascular procedures. First, surgery was determined and the decision of originally, all types of infra-renal AAA surgeries were conventional AAA, Y-Graft, and Direct ey then suggested that only the conventional with the experimental procedure. The Y-Graft ded because of the complexities involved in
The data in Figure 2 (seen below) show a downward trend in cost for the sample surgery. The cost for the first surgery was near the average cost for the conventional surgery. The second and third surgeries showed a decrease in total cost. This was mainly due to the fact that the first case was a compassion case and was complicated. The second was also a compassion case, but was less rigorous than the first one.

After looking at the 18 selected clinical groups, a breakdown was given of the highest costing categories. This aided in showing where large portions of hospital costs lie. They also show whether these costs have the potential to decrease over time.

Figure 2

*The downward trend is continued through Person 3, by using half of the original imaging costs. This adjustment was made because Patient 3 had imaging done twice.*
In Figure 3 the imaging costs were highest for the non-invasive surgeries. This was expected because of the detailed imaging needed to perform this surgery. General Imaging and Surgical Services in the OR were the only two categories in which the non-invasive technique costs were higher than the conventional surgery. The Nursing ICU and the Pharmacy show a definite downward trend. From this we notice a learning curve pattern.

Figure 3
consistently had one of the highest or second of the selected groups. The endovascular techniques were lower in cost. This shows that even though UHHS has new surgeries, there is potential to lower hospital costs can be kept from being unnecessarily duplicated.
Appendix B: Cost Comparison of Aortic Repair Costs
**Appendix C: Contacts**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy Regiani</td>
<td>(Finance)</td>
<td>763-7137</td>
</tr>
<tr>
<td>Louisa Griffes</td>
<td>(Finance TSI)</td>
<td>764-7378</td>
</tr>
<tr>
<td>Scott Lovelace</td>
<td>(OR)</td>
<td>936-8510</td>
</tr>
<tr>
<td>Sherrie Domas</td>
<td>(Hospital Billing)</td>
<td>936-6939</td>
</tr>
<tr>
<td>Becky Bertha</td>
<td>(OR Nurse #11)</td>
<td>936-8510</td>
</tr>
<tr>
<td>Manette London</td>
<td>(Radiology)</td>
<td>936-8874</td>
</tr>
<tr>
<td>Fran Palms</td>
<td>(Vascular Surgery Admin)</td>
<td>936-7301</td>
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