5-25-2016

Literature Review on Hospital Costs for Patients Undergoing Colectomy

Brian P.H. Chen, ScM
Jefferson College of Population Health, Po-Han.Chen@jefferson.edu

Hang Cheng
Ethicon Inc., Johnson and Johnson, Cincinnati, Ohio

Martha Romney, RN, MS, JD, MPH
Jefferson College of Population Health, Thomas Jefferson University, Martha.Romney@jefferson.edu

Carine Chia-Wen Hsiao
Ethicon Inc., Johnson and Johnson, Cincinnati, Ohio

Follow this and additional works at: http://jdc.jefferson.edu/jcphposters

Part of the Health Services Research Commons

Let us know how access to this document benefits you

Recommended Citation
Chen, ScM, Brian P.H.; Cheng, Hang; Romney, RN, MS, JD, MPH, Martha; and Chia-Wen Hsiao, Carine, "Literature Review on Hospital Costs for Patients Undergoing Colectomy" (2016). Jefferson College of Population Health Posters. 11.
http://jdc.jefferson.edu/jcphposters/11

This Article is brought to you for free and open access by the Jefferson Digital Commons. The Jefferson Digital Commons is a service of Thomas Jefferson University’s Center for Teaching and Learning (CTL). The Commons is a showcase for Jefferson books and journals, peer-reviewed scholarly publications, unique historical collections from the University archives, and teaching tools. The Jefferson Digital Commons allows researchers and interested readers anywhere in the world to learn about and keep up to date with Jefferson scholarship. This article has been accepted for inclusion in Jefferson College of Population Health Posters by an authorized administrator of the Jefferson Digital Commons. For more information, please contact: JeffersonDigitalCommons@jefferson.edu.
Colectomy is a surgical procedure to remove all or part of the colon. This study aims to identify the range of direct hospital costs associated with a minimally invasive colectomy.

Objectives

This study aims to identify the range of direct hospital costs associated with a minimally invasive or open colectomy procedure across different countries.

Methods

A PubMed search was performed using the keywords (Colectomy[MeSH] AND (Cost OR economics) AND (laparoscopic OR open) NOT (robot) with results limited to publications of human subject studies in English.

Publication dates: January 1, 2004 to December 31, 2015.

Studies comparing minimally invasive surgical techniques (laparoscopic or laparoscopic-assisted) to open surgical techniques were selected and studies of comparisons other than minimally invasive versus open procedures (e.g., robotic) were excluded.

All abstracts were filtered, including meta-analysis, RCTs and observational studies excluding case studies.

Key data abstracted: Country, year, setting, type of study, cost calculation method, approach, OR cost per minute and total direct cost reported.

Operating room (OR) cost include OR time and equipment cost. Some studies may also include anesthesia cost and do not have the granularity to be teased out.

We derived the unit cost for OR by dividing the OR cost over the mean OR time (minutes) and the unit total cost by dividing the total cost reported over the mean length of stay (days) reported in each study.

All cost values were adjusted for inflation and reported as 2016 real U.S. dollars.

Table 1. Selected Study Characteristics, Design, Cost and Cost Analysis Methodologies

<table>
<thead>
<tr>
<th>Citation/Year</th>
<th>Country/Setting</th>
<th>Type of Study</th>
<th>Cost Calculation</th>
<th>Approach</th>
<th>OR Cost (per Min)</th>
<th>Total Direct Cost Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>da Luz Moreira et al., 2010</td>
<td>US</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$18.2</td>
</tr>
<tr>
<td>Zhitk et al., 2009</td>
<td>US</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Hand-Assisted Lap</td>
<td>$21.4</td>
</tr>
<tr>
<td>Koopmann et al., 2007</td>
<td>US</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic-Assisted</td>
<td>$24.8</td>
</tr>
<tr>
<td>Vaid et al., 2012</td>
<td>US</td>
<td>National Database</td>
<td>Observational</td>
<td>Top-down (Charge)</td>
<td>Laparoscopic</td>
<td>$19.2</td>
</tr>
<tr>
<td>Salloum et al., 2006</td>
<td>US</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Delaney et al., 2008</td>
<td>US</td>
<td>National Database</td>
<td>Observational</td>
<td>Top-down (Payment)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Crawshaw et al., 2015</td>
<td>US</td>
<td>National Database</td>
<td>Observational</td>
<td>Top-down (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Hinojosa et al., 2007</td>
<td>US</td>
<td>National Database</td>
<td>Observational</td>
<td>Top-down (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Axelle et al., 2007</td>
<td>US</td>
<td>National Database</td>
<td>Observational</td>
<td>Top-down (Charge)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Hardy et al., 2014</td>
<td>Canada</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Franks et al., 2006</td>
<td>UK</td>
<td>Multi-Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Noblett et al., 2007</td>
<td>UK</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Bertani et al., 2011</td>
<td>Italy</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Ehrlich et al., 2015</td>
<td>Finland</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Liu et al., 2012</td>
<td>China</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Huang et al., 2012</td>
<td>China</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Liang et al., 2006</td>
<td>Taiwan</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
<tr>
<td>Shabbir et al., 2009</td>
<td>Singapore</td>
<td>Single Center</td>
<td>Observational</td>
<td>Bottom-up (Cost)</td>
<td>Laparoscopic</td>
<td>$12.6</td>
</tr>
</tbody>
</table>

Figure 1. Average Total Direct Cost Reported per Day

$2,222 $2,122 $1,662 $1,755 $744 $440 $500 $1,000 $1,500 $2,000 $2,500 $0

Laparoscopic Open

APAC EU NA

Results

- Twenty-six of 99 articles were included in the analysis. Ten (38%) studies were conducted in North America with the remaining based in European and Asian-Pacific countries.
- For laparoscopic colectomy, several review studies reported longer operating time (27–92 min), shorter hospital stay (3–10 days) and less blood loss (10–100 ml).
- The findings from 2 meta-analysis studies reporting total direct costs indicated higher costs for laparoscopies ranging from $177 to $836.
- Direct hospital costs varied dramatically across countries. In North America, the cost of operating rooms (min) ranged from $13-423 for open procedures and $18-25 for laparoscopies. The anesthesia cost (min) ranged from $7-150 and the hospital cost (day) ranged from $938-$3080 regardless of procedure type.
- In European countries, the cost of operating rooms (min) ranged from $15-355 for open procedures and $15-467 for laparoscopies. The hospital cost (day) ranged from $1277-$2852.
- In Asia, the cost of operating rooms (min) ranged from $5-$12 for open procedures and $13-$154 for laparoscopies. The hospital cost (day) ranged from $345-$765.

Conclusion

Open procedures seem to result in lower hospital costs across studies conducted in several regions, which is consistent with the cost analysis of a recent meta-analysis. Asian-Pacific countries have reported lower direct hospital costs. Cost calculation is challenging even for common surgical procedures due to different costing methodologies and categories. A standardized costing methodology guideline is warranted and may shed light on the future considerations of reimbursement strategy.

References