TITLE: Automated Counting Technology for Surgical Counts: Clinical Effectiveness, Cost Effectiveness, and Guidelines

DATE: 01 April 2015

RESEARCH QUESTIONS

1. What is the clinical effectiveness of radiofrequency identification coding for surgical counts in patients undergoing surgical procedures?

2. What is the cost-effectiveness of radiofrequency identification coding for surgical counts in patients undergoing surgical procedures?

3. What is the clinical effectiveness of bar coding for surgical counts in patients undergoing surgical procedures?

4. What is the cost-effectiveness of bar coding for surgical counts in patients undergoing surgical procedures?

5. What are the evidence-based guidelines regarding the use of automated counting technologies for surgical counts in patients undergoing surgical procedures?

KEY FINDINGS

One systematic review, five non-randomized studies, and one economic evaluation were identified regarding automated counting technology for surgical counts.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2015, Issue 3), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English
language documents published between January 1, 2010 and March 18, 2015. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Selection Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Comparator</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Study Designs</strong></td>
</tr>
</tbody>
</table>

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

One systematic review, five non-randomized studies, and one economic evaluation were identified regarding automated counting technology for surgical counts. No relevant health technology assessments, randomized controlled trials, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

The following summarizes the reported findings from one systematic review, one non-randomized studies, and one economic evaluation based on the technology used. No relevant evidence-based guidelines were identified; therefore, no summary can be provided.

**Radiofrequency**

There were no reported radiofrequency failures for tagged laparoscopic instruments in one study. One near miss and 35 surgical-sponge miscounts were resolved with the assistance of a
radiofrequency system in another study.\(^3\) One study\(^4\) reported on the use of a radiofrequency mat and a radiofrequency wand in patients with morbid obesity; 12 false negative readings were obtained with the mat, while no false negative readings were reported with the wand. Radiofrequency chips were embedded in sponges in another study\(^6\) with a reported sensitivity and specificity of 100%. The one identified economic study\(^7\) evaluated the cost-effectiveness of radiofrequency technology. Expenses accrued in radiofrequency adoption were outweighed by the savings associated with avoiding x-rays, time spent in the operating room, and medico-legal costs.\(^7\)

**Bar Coding**

One study\(^5\) reported no retained surgical items after implementation of a data-matrix-coded sponge system as opposed to an average of one retained sponge every 64 days prior to bar code implementation. One systematic review of comparative economic analyses\(^1\) reported that bar coding sponges were less economical when compared to standard methods for surgical counting.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials
No literature identified.

Non-Randomized Studies


Economic Evaluations

Guidelines and Recommendations
No literature identified.

PREPARED BY:
Canadian Agency for Drugs and Technologies in Health
Tel: 1-866-898-8439
www.cadth.ca
APPENDIX – FURTHER INFORMATION:

Systematic Reviews and Meta-analyses – Unspecified Patient Outcomes


Non-Randomized Studies

Risk Factors


Alternate forms of Recognition of Surgical Instruments/Sponges


Clinical Practice Guidelines – Unclear Methodology