TITLE: Computed Tomography to Evaluate Children with Suspected Appendicitis: Clinical and Cost-Effectiveness, Diagnostic Accuracy, and Guidelines

DATE: 17 April 2015

RESEARCH QUESTIONS

1. What is the clinical effectiveness of computed tomography to evaluate children with suspected appendicitis?

2. What is the diagnostic accuracy of computed tomography to evaluate children with suspected appendicitis?

3. What is the cost-effectiveness of computed tomography compared with ultrasound when evaluating children with suspected appendicitis?

4. What are the evidence-based guidelines associated with computed tomography use to evaluate children with suspected appendicitis?

KEY FINDINGS

Four non-randomized studies and one evidence-based guideline were identified regarding computed tomography to evaluate children with suspected appendicitis.

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. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic studies, and guidelines. 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 31, 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><strong>Table 1: Selection Criteria</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
</tr>
</tbody>
</table>
| **Comparator** | No CT  
| | CT after ultrasound  
| | Ultrasound first, then CT if ultrasound results equivocal |
| **Outcomes** | Clinical effectiveness (benefits and harms)  
| | Diagnostic accuracy  
| | Cost-effectiveness  
| | Guidelines |
| **Study Designs** | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic studies, and evidence-based guidelines |

**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.

Four non-randomized studies and one evidence-based guideline were identified regarding computed tomography to evaluate children with suspected appendicitis. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or economic evaluations were identified.

Additional references of potential interest are provided in the appendix.

**OVERALL SUMMARY OF FINDINGS**

Four non-randomized studies and one evidence-based guideline were identified regarding computed tomography to evaluate children with suspected appendicitis.

One retrospective study assessed whether the increased use of abdominal computed tomography (CT) would increase the detection rate of acute appendicitis, of other surgical conditions, and decrease hospital admission rates. The authors did not report improved outcomes. A second retrospective study of short-interval CT reported that few CT scans reveal appendicitis or other conditions requiring urgent surgery.

One study examined the utility of CT following ultrasound in conjunction with a clinical appendicitis score and reported little additional benefit of CT when the appendicitis score was
below the positive threshold. However, the authors reported that there was a benefit when the appendicitis score was at or above the positive threshold. Another study that on focused abdominal CT in clinically equivocal cases of acute appendicitis\(^4\) reported a sensitivity of 91%, a specificity of 69%, and an accuracy of 76%.

The American College of Radiology appropriateness criteria for suspected appendicitis\(^5\) recommends a CT scan following negative or equivocal ultrasound in children younger than 14 years of age.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials
No literature identified.

Non-Randomized Studies

Clinical Effectiveness


Diagnostic Accuracy


Economic Evaluations
No literature identified.

Guidelines and Recommendations

APPENDIX – FURTHER INFORMATION:

Non-randomized studies – Age group unclear


Economic Evaluations – Adult age group


Guidelines and Recommendations – Unclear Methodology
