Ultraviolet Light for the Disinfection of Ultrasound Probes: Clinical Effectiveness, Cost-Effectiveness, and Guidelines
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Acknowledgments:

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada’s health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.
Research Questions

1. What is the clinical effectiveness of ultraviolet light for the disinfection of ultrasound probes?

2. What is the cost-effectiveness of ultraviolet light for the disinfection of ultrasound probes?

3. What are the evidence-based guidelines and recommendations for the use of ultraviolet light for the disinfection of ultrasound probes?

4. What are the evidence-based guidelines and recommendations for disinfection of ultrasound probes?

Key Findings

Two non-randomized studies were identified regarding the use of ultraviolet light for the disinfection of ultrasound probes. In addition, one evidence-based guideline regarding the general disinfection of ultrasound probes was identified.

Methods

This report makes use of a literature search conducted for a previous CADTH report. The original literature search was conducted in June 2015 on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit retrieval by study type. Where possible, retrieval was limited to the human population. The initial search was also limited to English language documents published between January 1, 2011 and June 15, 2015. For the current report, database searches were rerun on May 15, 2018 to capture any articles published since the initial search date. The search of major health technology agencies, as well as a focused Internet search was also updated to include documents published since June 2015.

Selection Criteria

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

<table>
<thead>
<tr>
<th>Population</th>
<th>Ultrasound probes (e.g., endo-vaginal probes in health care settings)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Q1-3: Ultraviolet light (e.g., Germitec)</td>
</tr>
<tr>
<td></td>
<td>Q4: Disinfecting techniques</td>
</tr>
<tr>
<td>Comparator</td>
<td>Q1-3: Any comparator; No comparator</td>
</tr>
<tr>
<td></td>
<td>Q4: No comparator</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Q1: Efficacy in disinfection</td>
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<tr>
<td></td>
<td>Q2: Cost-effectiveness</td>
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<td></td>
<td>Q3-4: Guidelines</td>
</tr>
<tr>
<td>Study Designs</td>
<td>Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines</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.

Two non-randomized studies were identified regarding the use of ultraviolet light for the disinfection of ultrasound probes. In addition, one evidence-based guideline regarding the general disinfection of ultrasound probes was identified. 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

One non-randomized study\(^1\) compared the effectiveness of ultraviolet (UV) light with a germicidal lamp for the disinfection of artificially infected ultrasound probes. The authors concluded that UV disinfection was the most effective method among those used in the study. The second non-randomized study\(^2\) compared UV radiation with ortho-phthalaldehyde for the disinfection of ultrasound probes exposed to human papillomavirus (HPV). The UV radiation device was effective against HPV, while ortho-phthalaldehyde was shown to be minimally effective.\(^2\) The authors concluded that healthcare facilities should consider the use of UV disinfection for ultrasound probes.\(^2\)

An evidence-based guideline\(^3\) was identified from the National Health Service for the decontamination of semi-critical ultrasound probes; namely semi-invasive and non-invasive ultrasound probes. Based on high level evidence, the guideline recommends the use of UV disinfection systems for the decontamination of semi-invasive ultrasound probes.\(^3\) Based on low level evidence, automated hydrogen peroxide systems and manual disinfection techniques are recommended for the decontamination of semi-invasive ultrasound probes.\(^3\)
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


Economic Evaluations
No literature identified.

Guidelines and Recommendations

Appendix — Further Information

Previous CADTH Reports


Clinical Practice Guidelines

Rigour of Methodology Unclear


Methodology Not Reported


Review Articles


Vaginal Probes Not Specified


Additional References
