CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Single-Use Holter Monitors in an Outpatient Setting: Clinical Utility, Diagnostic Accuracy, Cost-Effectiveness and Guidelines
Research Questions

1. What is the comparative clinical utility of single-use, single-channel Holter monitors versus traditional, reusable, multi-channel Holter monitors in patients with cardiac arrhythmia in an outpatient setting?

2. What is the diagnostic accuracy of single-use, single-channel devices in diagnosing cardiac arrhythmias in cardiac outpatients?

3. What is the cost-effectiveness of single-use, single-channel Holter monitors versus traditional, reusable, multi-channel Holter monitors in patients with cardiac arrhythmia in an outpatient setting?

4. What are the evidence-based guidelines regarding single-use, or single-channel Holter monitors in patients with cardiac arrhythmia in an outpatient setting?

Key Findings

Three non-randomized studies were identified regarding the clinical utility and diagnostic accuracy of single-use, single-channel devices in patients with cardiac arrhythmia in an outpatient setting. In addition, one evidence-based guideline was identified regarding single-use, or single-channel Holter monitors in patients with cardiac arrhythmia in an outpatient setting. No relevant economic evaluations were identified regarding the cost-effectiveness of single-use, single-channel Holter monitors versus traditional, reusable, multi-channel Holter monitors in patients with cardiac arrhythmia in an outpatient setting.

Methods

A limited literature search was conducted by an information specialist on key resources including Medline, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Library, the University of York Centre for Reviews and Dissemination (CRD) databases, the websites of Canadian and major international health technology agencies, as well as a focused Internet search. The search strategy was comprised of both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were single-use cardiac monitors and outpatients. 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 Jan 1, 2014 and Sep 6, 2019. Internet links were provided, where available.
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>Q1-4: Patients of any age with cardiac arrhythmia (e.g., atrial fibrillation) in an outpatient setting</th>
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<tbody>
<tr>
<td>Intervention</td>
<td>Q1-4: Single-use, single channel or single-lead Holter monitor (e.g., CardioStat, Zio) also referred to as a patch monitor</td>
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<tr>
<td>Comparator</td>
<td>Q1-3: Reusable/ multi-channel or multi-lead Holter monitor</td>
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<tr>
<td>Comparator</td>
<td>Q4: Not applicable</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Q1: Clinical utility (e.g., benefit, harm, risk, patient management, mortality, morbidity, patient comfort, data acquisition time)</td>
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<tr>
<td>Outcomes</td>
<td>Q2: Diagnostic accuracy (e.g., arrhythmia detection, accurate diagnosis, sensitivity, specificity)</td>
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<td>Outcomes</td>
<td>Q3: Cost-effectiveness</td>
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<tr>
<td>Outcomes</td>
<td>Q4: Evidence-based 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>
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</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.

Three non-randomized studies\(^1\)\(^-\)\(^3\) were identified regarding the clinical utility and diagnostic accuracy of single-use, single channel devices in patients with cardiac arrhythmia in an outpatient setting. In addition, one evidence-based guideline\(^4\) was identified regarding single-use, or single-channel Holter monitors in patients with cardiac arrhythmia in an outpatient setting. 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

Three non-randomized studies\(^1\)\(^-\)\(^3\) were identified regarding the clinical utility and diagnostic accuracy of single-use, single channel devices in patients with cardiac arrhythmia in an outpatient setting. Authors of the first non-randomized study\(^1\) compared a single-lead patch monitor, BeyondCare, to the twelve-lead Holter monitor for a 24 hour period and found that the patch had a comparable arrhythmia detection rate to that of the Holter monitor.\(^2\) The authors of this study also found that the BeyondCare patch monitor was well-tolerated by participants, thus resulting in longer wear time and longer periods of continuous ECG monitoring.\(^1\) The authors of the second study\(^2\) compared the single-lead patch monitor, CardioStat, to the 24-hour, twelve-lead Holter monitor and found that both had similar detection rates of atrial fibrillation.\(^2\) The authors also found that the CardioStat was superior to discriminate premature atrial and ventricular beats, and again, had longer periods of continuous monitoring, easier installation and added value of being water resistant. The
authors of the last identified study\(^3\) compared the diagnostic efficacy of an ECG patch monitor (designed specifically to ensure better P-wave visualization) to a three-lead Holter monitor. The authors found that the patch significantly improved rhythm diagnosis and avoided inaccurate diagnoses made by the standard three-channel, or three-lead Holter monitor.\(^3\)

A guideline from both the American College of Cardiology and the American Heart Association state that devices such as adhesive patch recorders, and mobile continuous outpatient telemetry monitoring provide a higher diagnostic yield than 24- or 48-hour Holter monitoring because of the longer period of monitoring, which may also be useful in the evaluation of suspected bradycardia or conduction disorders.\(^3\)

**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


See: Recommendation-Specific Supportive Text, page e68.
Appendix — Further Information

Previous CADTH Reports


Health Technology Assessments


Randomized Controlled Trials

Number of Channels Not Specified


Alternative Comparator


Alternative Comparator – No Holter Monitor


Non-Randomized Studies

Number of Channels Not Specified


No Comparator


Ongoing Studies


Conference Abstracts