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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.

Funding: CADTH receives funding from Canada’s federal, provincial, and territorial governments, with the exception of Quebec.

Questions or requests for information about this report can be directed to requests@cadth.ca
Research Questions

1. What is the clinical effectiveness of micro-processor-controlled prosthetics for patients with amputation at the hand, elbow, ankle, or knee?
2. What is the cost-effectiveness of micro-processor-controlled prosthetics for patients with amputation at the hand, elbow, ankle, or knee?
3. What are the evidence-based guidelines regarding micro-processor-controlled prosthetics for patients with amputation at the hand, elbow, ankle, or knee?

Key Findings

One systematic review, 14 non-randomized studies, and two economic evaluations were identified regarding the clinical effectiveness of micro-processor-controlled prosthetics for patients with amputation at the hand, elbow, ankle, or knee. In addition, two evidence-based guidelines were identified.

Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, 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 microprocessors and artificial limbs. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2014 and July 15, 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>
<thead>
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<th>Table 1: Selection Criteria</th>
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<tr>
<td><strong>Population</strong></td>
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<td><strong>Intervention</strong></td>
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<td><strong>Comparator</strong></td>
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### Outcomes

| Q1: Clinical effectiveness (e.g., patient quality of life, falls, adverse events) |
| Q2: Cost effectiveness |
| Q3: Guidelines |

### Study Designs

Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines

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**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, 14 non-randomized studies, two economic evaluations, and two evidence-based guidelines were identified regarding the clinical or cost effectiveness of micro-processor-controlled prosthetics for patients with amputation at the hand, elbow, ankle, or knee. No relevant health technology assessments or randomized controlled trials were identified.

Additional references of potential interest are provided in the appendix.

**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**


Appendix — Further Information

Review Articles

Systematic Review with Unspecified Comparator(s)


Non-Randomized Study


Clinical Guidelines – Uncertain Methodology


Additional References

Secondary Review of a Systematic Review