Virtual Reality or Gaming Applications for Pain Management or Distraction: Clinical 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 virtual reality or gaming applications for pain management or distraction in patients undergoing medical procedures?

2. What are the evidence-based guidelines regarding the use of virtual reality or gaming-based interventions for pain management or distraction?

Key Findings

Four systematic reviews, 16 randomized controlled trials, two non-randomized studies, and two evidence-based guidelines were identified regarding the clinical effectiveness of virtual reality or video game-based treatment approaches for patients requiring pain management or distraction during medical procedures.

Methods

A limited literature search was conducted 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 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, 2012 and July 27, 2017. 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>Intervention</th>
<th>Comparator</th>
<th>Outcomes</th>
<th>Study Designs</th>
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<tbody>
<tr>
<td>Patients requiring pain management or distraction during medical procedures (e.g., burn patients undergoing wound care, patients receiving immunizations)</td>
<td>Virtual reality or video game-based treatment approaches (e.g. virtual reality headset systems, motion capture systems, SnowWorld, Ditto, Nintendo Wii); alone or in combination with standard of care</td>
<td>Q1: No treatment; Alternative therapies for pain management or distraction; Standard of care Q2: No comparator required</td>
<td>Q1: Clinical benefits and harms (e.g., pain, anxiety, pain medication use) Q2: Evidence-based guidelines, including recommendations regarding treatment protocols and infection control considerations</td>
<td>Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, 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, and evidence-based guidelines.

Four systematic reviews, 16 randomized controlled trials, two non-randomized studies, and two evidence-based guidelines were identified regarding the clinical effectiveness of virtual reality or video game-based treatment approaches for patients requiring pain management or distraction during medical procedures. No relevant health technology assessments or meta-analyses were identified.

Additional references of potential interest are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-Analyses

Mixed Population


Pediatric Population


Unspecified Population

**Randomized Controlled Trials**

**Adult Population**

   PubMed: PM28570305

   PubMed: PM27904638

   PubMed: PM25999621

   PubMed: PM25102532

**Pediatric Population**

   PubMed: PM27128220


   PubMed: PM27380603

   PubMed: PM24360745


Unspecified Population


Non-Randomized Studies

Mixed Population


Unspecified Population

Guidelines and Recommendations

See p. 5 “Behavioural Interventions”

See p. 67 “Virtual reality (VR)”
Appendix — Further Information

Economic Evaluations