TITLE: Smart Infusion Pump Use in Oncology Settings: Safety and Guidelines

DATE: 27 February 2015

RESEARCH QUESTIONS

1. What is the clinical evidence regarding the safety of smart infusion pump use for the delivery of chemotherapeutic agents in oncology settings?

2. What are the evidence-based guidelines regarding the use of smart infusion pumps in oncology settings?

KEY FINDINGS

One non-randomized study and one evidence-based guideline were identified regarding the use of smart infusion pumps in oncology settings.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2015, Issue 2), University of York Centre for Reviews and Dissemination (CRD) databases, CINAHL, 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, 2010 and February 12, 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 1: Selection Criteria

<table>
<thead>
<tr>
<th>Population</th>
<th>Patients of any age receiving intravenous chemotherapy in an in-patient or outpatient oncology setting</th>
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<tbody>
<tr>
<td>Intervention</td>
<td>Smart infusion pumps</td>
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<tr>
<td>Comparator</td>
<td>Traditional infusion pumps</td>
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<tr>
<td></td>
<td>No comparator</td>
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<tr>
<td>Outcomes</td>
<td>Safety</td>
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<tr>
<td></td>
<td>Evidence-based guidelines</td>
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<tr>
<td>Study Designs</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.

One non-randomized study and one evidence-based guideline were identified regarding the use of smart infusion pumps in oncology settings. No relevant health technology assessments, systematic reviews, meta-analyses, or randomized controlled trials were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

The results of one non-randomized study suggested that administration errors could be reduced by five percent by using smart infusion pumps for administration of oncology therapy. The majority of errors observed in the study were associated with infusion rates lower than the recommended rate. The guideline prepared by Cancer Care Ontario provides a comparison chart outlining the safety features of four different types of infusion pumps: volumetric, elastomeric, smart pump, and smart pump with barcoding. The safety features of smart pumps may include the prevention of wrong dose errors, wrong route errors, wrong time errors, and wrong documentation errors. The guideline suggests the type of infusion pump used will depend on the context of the individual institution and highlights the requirement that smart pumps be integrated into a full medication management system.
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


Guidelines and Recommendations


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APPENDIX – FURTHER INFORMATION:

Review Articles


Additional References


