

TITLE: Hospira Plum A+ Infusion Pumps and Mednet Software: Guidelines and Clinical Effectiveness, Safety, and Cost-effectiveness

DATE: 05 September 2008

RESEARCH QUESTIONS:

1. What is the clinical effectiveness and safety of the Hospira Plum A+ infusion pump and MedNet computer software compared with other similar infusion pumps and software? How does the level of free-flow protection in this pump compare to other free-flow protected pumps?
2. What is the safety of the needlessness CLAVE connectors in the intravenous tubing used with the Hospira Plum A+ pump compared with the connectors used in the IV tubing with other infusion pumps? (from an infection control perspective)
3. What is the cost-effectiveness of the Hospira Plum A+ infusion pump and the MedNet software program compared with other infusion pumps and their corresponding software programs?
4. Are there clinical practice guidelines that recommend what type of infusion pumps and software programs should be used to reduce medical errors and improve patient safety?

METHODS:

A limited literature search was conducted on key health technology assessment resources, including PubMed, the Cochrane Library (Issue 3, 2008), University of York Centre for Reviews and Dissemination (CRD) databases, ECRI, EuroScan, international health technology agencies, and a focused Internet search. Results include articles published between 2003 and August, 2008; however, for the infection control section the publication dates start with 1998. Only English language materials were selected. Filters were applied to limit the retrieval to health technology assessments, systematic reviews, randomized clinical trials, clinical guidelines and economic studies. Internet links are provided, where available.

Disclaimer: The Health Technology Inquiry Service (HTIS) is an information service for those involved in planning and providing health care in Canada. HTIS responses are based on a limited literature search and are not comprehensive, systematic reviews. The intent is to provide a list of sources of the best evidence on the topic that CADTH could identify using all reasonable efforts within the time allowed. HTIS responses should be considered along with other types of information and health care considerations. The information included in this response is not intended to replace professional medical advice, nor should it be construed as a recommendation for or against the use of a particular health technology. Readers are also cautioned that a lack of good quality evidence does not necessarily mean a lack of effectiveness particularly in the case of new and emerging health technologies, for which little information can be found, but which may in future prove to be effective. While CADTH has taken care in the preparation of the report to ensure that its contents are accurate, complete and up to date, CADTH does not make any guarantee to that effect. CADTH is not liable for any loss or damages resulting from use of the information in the report.

Copyright: This report contains CADTH copyright material and may contain material in which a third party owns copyright. **This report may be used for the purposes of research or private study only.** It may not be copied, posted on a web site, redistributed by email or stored on an electronic system without the prior written permission of CADTH or applicable copyright owner.

Links: This report may contain links to other information on available on the websites of third parties on the Internet. CADTH does not have control over the content of such sites. Use of third party sites is governed by the owners' own terms and conditions.

The summary of findings was generated from the abstracts or the summaries of the relevant information.

RESULTS:

HTIS 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 economic evaluations, randomized controlled trials, and evidence-based guidelines.

There were no abstracts that met our selection criteria to evaluate the clinical and cost-effectiveness of Hospira Plum A+ infusion pumps and MedNet software in this HTIS report. It was not possible to determine the model of an infusion pump under investigation from the abstracts. Additional information that may be of interest is included in the Appendix.

OVERALL SUMMARY OF FINDINGS:

Computerized infusion safety systems, such as smart pumps, are one of the technologies that hospitals can employ to help reduce the frequency and severity of medication errors.¹

ERCI published evaluation reports on general-purpose infusion pumps in 2007 and 2004.^{2,6} It suggested that when purchasing new general-purpose infusion pumps, only consider those that have a dose error reduction system;⁶ the Hospira Plum A+ with MedNet was suggested to be one of the better models. It was rated “acceptable” and recommended over four other acceptable pumps with dose error reduction software (the B. Braun Outlook 100 and 200 and the Baxter Colleague CX and 3CX pumps). However, the Plum A+ lacks the large memory and bolus limit capability of one of the models that ERCI rated “preferred” (the Alaris Medley Medication Safety System with Guardrails).^{2,6}

REFERENCES SUMMARIZED:

Health technology assessments

No literature identified.

Systematic reviews and meta-analyses

No literature identified.

Economic analyses and cost information

No literature identified.

Randomized controlled trials

No literature identified.

Guidelines and recommendations

No literature identified.

PREPARED BY:

Stella Chen, Research Officer

Raymond Banks, Information Specialist

Health Technology Inquiry Service

Email: htis@cadth.ca

Tel: 1-866-898-8439

APPENDIX – FURTHER INFORMATION:

1. Vanderveen T. Smart Pumps: Advanced Capabilities and Continuous Quality Improvement. *Patient Saf Qual Healthcare* January/February. 2007. Available at: <http://www.psqh.com/janfeb07/smartpumps.html> (accessed 05 Sept 2008).
2. ECRI Institute. General-purpose infusion pumps: evaluation. In: *Health devices alert* [database online]. Plymouth Meeting (PA): ECRI; 2007. Available for a fee: <https://www.ecri.org/Pages/default.aspx> (accessed 05 Sept 2008).
3. ECRI Institute. Plum A+ 3 infusion system with Hospira MedNet Software. In: *Health devices alert* [database online]. Plymouth Meeting (PA): ECRI; 2007. Available for a fee: <https://www.ecri.org/Pages/default.aspx><https://www.ecri.org/Pages/default.aspx> (accessed 05 Sept 2008).
4. Office of Device Evaluation, Federal Food and Drug Administration. *The Hospira Plum A+ infusion system* [letter]. Rockville(MD): FDA; 2007. Available: <http://www.fda.gov/cdrh/pdf7/K070398.pdf> (accessed 05 Sept 2008).
5. Zielski S. Smart pumps reduce medication delivery errors. *Healthcare Purch News* December, 2007. Available at: <http://www.hponline.com/inside/2007-12/0712-whatworks.html> (accessed 05 Sept 2008).
6. ECRI Institute. Evaluating the Hospira Plum A+ with MedNet. In: *Health devices alert* [database online]. Plymouth Meeting (PA): ECRI; 2004. Available for a fee: <https://www.ecri.org/Pages/default.aspx> (accessed 05 Sept 2008).
7. Centre for Evidence-based Purchasing(UK). *Evaluation report: Hospira Plum A+ volumetric infusion pump* [full report]. Reading (UK): NHS Purchasing and Supply Agency; 2007. CEP 07014. Available: <http://www.pasa.nhs.uk/PASAWeb/NHSprocurement/CEP/outputs/Genmedsocialcare.ht> (accessed 05 Sept 2008). *Note: click on "infusion pumps" to get to report.*
8. ECRI Institute. Product comparison infusion pumps: general-purpose. In: *Health devices alert* [database online]. Plymouth Meeting (PA): ECRI; 2006. Available for a fee: <https://www.ecri.org/Pages/default.aspx> (accessed 05 Sept 2008).