



TITLE: Intravenous Infusion Pumps for Transfusion of Blood Products: Clinical Effectiveness and Guidelines

DATE: 14 July 2014

RESEARCH QUESTIONS

1. What is the clinical effectiveness of intravenous infusion pumps for transfusion of blood products?
2. What are the guidelines for the use of intravenous infusion pumps for transfusion of blood products?

KEY MESSAGE

One evidence-based guideline was identified regarding the use of intravenous infusion pumps for transfusion of blood products.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2014, Issue 6), 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. The search was limited to English language documents published between Jan 1, 2010 and Jun 30, 2014. 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.

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

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presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One evidence-based guideline was identified regarding the use of intravenous infusion pumps for transfusion of blood products. No health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or non-randomized studies were identified regarding the clinical effectiveness of intravenous infusion pumps for transfusion of blood products.

Additional references of potential interest are provided in the appendix.

This report is an update to [Intravenous Infusion Pumps for Transfusion of Blood Products: Clinical Effectiveness, Safety, and Guidelines](#), published August 2010.

OVERALL SUMMARY OF FINDINGS

One guideline¹ by the Dutch Institute for Healthcare Improvement was identified. The guideline recommends the use of volume-controlled infusion pumps or syringe pumps for slow administration or small infusion volumes. Infusion pumps should only be used to administer those blood components that are indicated in the manufacturer's specifications. The guideline recommends infusion pumps be checked by health care staff at least once an hour when transfusing erythrocytes. If requested, manufacturers must be able to provide evidence that their infusion pump does not result in hemolysis or damage to blood components.

No literature was identified regarding the clinical effectiveness of intravenous infusion pumps for transfusion of blood products.

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

No literature identified.

Guidelines and Recommendations

1. Blood components: characteristics, indications, logistics and administration. In: Blood transfusion guideline. Utrecht (The Netherlands): Dutch Institute for Healthcare Improvement CBO; 2011.
Summary available from:
<http://www.guideline.gov/content.aspx?id=37843&search=blood+transfusion+and+pump>
See: Infusion Pumps and Syringe Pumps

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APPENDIX – FURTHER INFORMATION:

Guidelines and Recommendations – Methodology Uncertain

2. Blood transfusion resource manual. Section H: administration of blood products [Internet]. London (ON): London Health Science Centre; 2014. [cited 2014 Jul 10]. Available from: http://www.lhsc.on.ca/lab/bldbank/btm/H_adminprod.pdf
See: VI. Infusion Pumps, page 4
3. Transfusion manual [Internet]. Portland (OR): Oregon Health & Science University; 2014 Mar. [cited 2014 Oct 7]. Available from: <http://www.ohsu.edu/pathology/transman/adminbloodprod.html>
See: Sections on Infusion Rates, Mechanical Pumps, and Pressure Bags
4. SHR Transfusion Medicine Service. Blood, blood components and fractionation products - administration of [Internet]. Saskatoon Health Region; 2012 Jan 11. [cited 2014 Jul 10]. Available from: <https://www.saskatoonhealthregion.ca/about/NursingManual/1141.pdf>
“Pump” and “Infusion Pump” mentioned throughout
5. Guidelines for the administration of blood products [Internet]. 2nd ed. Sydney (AU): Australian & New Zealand Society of Blood Transfusion Ltd.; 2011 Dec. [cited 2014 Jul 10]. Available from: http://www.anzsb.org.au/publications/documents/ANZSBT_Guidelines_Administration_Blood_Products_2ndEd_Dec_2011_Hyperlinks.pdf
See: 6.4 Infusion Devices, page 28
6. Transfusion procedures [Internet]. In: Blood transfusion policies and standard practices. Ann Arbor (MI): University of Michigan Health System; 2009 Mar 16. Chapter 6 [cited 2014 Jul 10]. Available from: http://www.pathology.med.umich.edu/bloodbank/manual/bbch_6/.
See: Pressure Infusion Devices

Laboratory Studies

7. Gelderman MP, Vostal JG. Rejuvenation improves roller pump-induced physical stress resistance of fresh and stored red blood cells. *Transfusion*. 2011 May;51(5):1096-104.
[PubMed: PM21133931](#)
8. Lieshout-Krikke RW, van der Meer PF, Koopman MM, de Korte D. Effect on the quality of blood components after simulated blood transfusions using volumetric infusion pumps. *Transfusion*. 2011 Aug;51(8):1835-9.
[PubMed: PM21303369](#)

Review Articles

9. Rathnayake T. Blood transfusion: blood products and infusion pumps. Adelaide (AU): The Joanna Briggs Institute; 2013 May 4. Subscription required.
10. Nightingale MJ, Norfolk DR, Pinchon DJ. Current uses of transfusion administration sets: a cause for concern? *Transfus Med*. 2010 Oct;20(5):291-302.

[PubMed: PM20553428](#)

Additional References

11. Galvey J, Ibey A, McConnell G, Rico RR. Infusion pumps for blood and blood products transfusions and administration [Internet]. Abstract presented at: RESNA Annual Conference. 2011. [cited 2014 Jul 10]. Available from: <http://resna.org/conference/proceedings/2011/CMBEC34/galvey-69501.pdf>