

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Administration of Vaccines and Parenteral Medications in Home Care Settings: Safety and Guidelines

Service Line: Rapid Response Service
Version: 1.0
Publication Date: February 26, 2020
Report Length: 8 Pages

Authors: Camille Dulong, Charlene Argáez

Cite As: Administration of vaccines and parenteral medications in home care settings: safety and guidelines. Ottawa: CADTH; 2020 Feb. (CADTH rapid response report: summary of abstracts).

Disclaimer: The information in this document is intended to help Canadian health care decision-makers, health care professionals, health systems leaders, and policy-makers make well-informed decisions and thereby improve the quality of health care services. While patients and others may access this document, the document is made available for informational purposes only and no representations or warranties are made with respect to its fitness for any particular purpose. The information in this document should not be used as a substitute for professional medical advice or as a substitute for the application of clinical judgment in respect of the care of a particular patient or other professional judgment in any decision-making process. The Canadian Agency for Drugs and Technologies in Health (CADTH) does not endorse any information, drugs, therapies, treatments, products, processes, or services.

While care has been taken to ensure that the information prepared by CADTH in this document is accurate, complete, and up-to-date as at the applicable date the material was first published by CADTH, CADTH does not make any guarantees to that effect. CADTH does not guarantee and is not responsible for the quality, currency, propriety, accuracy, or reasonableness of any statements, information, or conclusions contained in any third-party materials used in preparing this document. The views and opinions of third parties published in this document do not necessarily state or reflect those of CADTH.

CADTH is not responsible for any errors, omissions, injury, loss, or damage arising from or relating to the use (or misuse) of any information, statements, or conclusions contained in or implied by the contents of this document or any of the source materials.

This document may contain links to third-party websites. CADTH does not have control over the content of such sites. Use of third-party sites is governed by the third-party website owners' own terms and conditions set out for such sites. CADTH does not make any guarantee with respect to any information contained on such third-party sites and CADTH is not responsible for any injury, loss, or damage suffered as a result of using such third-party sites. CADTH has no responsibility for the collection, use, and disclosure of personal information by third-party sites.

Subject to the aforementioned limitations, the views expressed herein do not necessarily reflect the views of Health Canada, Canada's provincial or territorial governments, other CADTH funders, or any third-party supplier of information.

This document is prepared and intended for use in the context of the Canadian health care system. The use of this document outside of Canada is done so at the user's own risk.

This disclaimer and any questions or matters of any nature arising from or relating to the content or use (or misuse) of this document will be governed by and interpreted in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein, and all proceedings shall be subject to the exclusive jurisdiction of the courts of the Province of Ontario, Canada.

The copyright and other intellectual property rights in this document are owned by CADTH and its licensors. These rights are protected by the Canadian *Copyright Act* and other national and international laws and agreements. Users are permitted to make copies of this document for non-commercial purposes only, provided it is not modified when reproduced and appropriate credit is given to CADTH and its licensors.

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 evidence regarding the safety of the administration of vaccines or parenteral medications in home care settings?
2. What are the evidence-based guidelines regarding the administration of vaccines or parenteral medications in home care settings?

Key Findings

One health technology assessment, two systematic reviews, one randomized controlled trial and five non-randomized studies were identified regarding the safety of administering vaccines parenteral medications in home care settings. Additionally, one evidence-based guideline was identified regarding the administration of parenteral medications in home care settings.

Methods

A limited literature search was conducted by an information specialist on key resources including PubMed, 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 parenteral medications or vaccines and at home administration. Filters were applied to limit the retrieval to health technology assessments, systematic reviews, and meta analyses, randomized controlled trials, non-randomized studies, and guidelines. The search was also limited to English language documents published between January 1, 2015 and February 11, 2020. 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

Population	Adult and pediatric populations (with or without a history of anaphylaxis)
Intervention	Administration of vaccines or parenteral medications (the first dose alone or all subsequent doses) in home care settings and long-term care settings

Comparator	Q1: Administration of vaccines or parenteral medications (the first dose alone or all subsequent doses) in hospital, ambulatory care, or clinic settings Q2: No comparator required
Outcomes	Q1: Safety (e.g., rates of adverse events, allergic reactions, infections) Q2: Recommendations regarding best practices (e.g., administration protocols, appropriate patient populations, recommended safeguards)
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, evidence-based guidelines

Results

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports and systematic reviews are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One health technology assessment¹, two systematic reviews^{2,3}, one randomized controlled trial⁴ and five non-randomized studies⁵⁻⁹ were identified regarding the safety of administering vaccines parenteral medications in home care settings. Additionally, one evidence-based guideline¹⁰ was identified regarding the administration of parenteral medications in home care settings.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

One health technology assessment¹, two systematic reviews^{2,3}, one randomized controlled trial⁴ and five non-randomized studies⁵⁻⁹ were identified regarding the safety of administering vaccines parenteral medications in home care settings. Additionally, one evidence-based guideline¹⁰ was identified regarding the administration of parenteral medications in home care settings.

The identified health technology assessment¹ compared home-based subcutaneous (SC) administration of immunoglobulin at home to intravenous (IV) immunoglobulin within a hospital. The authors identified sixteen studies that met the inclusion criteria and found that serious bacterial infections rates did not differ between the two methods. Moreover, the incidence of adverse reactions was low for both IV and SC administration. Overall, the authors suggested that home-based SC administration of immunoglobulin is safe and comparable with hospital IV administration, although the evidence was considered low quality.¹

One of the identified systematic reviews² concluded that home-based IV antibiotic therapy for children was safe and effective compared to hospital-based IV antibiotic therapy with similar incidence of complications and readmissions between the two groups. Similarly, the author of the other identified systematic review³ concluded that home-based infusion had comparable adverse events and clinical outcomes to hospital-based infusion for patients.³

Additionally, the randomized controlled trial⁴ and one non-randomized study⁸ both compared the clinical effectiveness and safety of home-based antimicrobial therapy, IV ceftriaxone, and hospital-based antimicrobial therapy, IV flucloxacillin, in children with moderate or severe cellulitis. The authors of the randomized controlled trial⁴ concluded that

home-based IV ceftriaxone was non-inferior to hospital-based IV flucloxacillin regarding treatment failure and adverse events while the authors of the non-randomized study⁸ noted that more studies are needed to form a conclusion on the comparative safety and efficacy of home- versus hospital-based antimicrobial therapy.

Moreover, the other four non-randomized studies^{5,6,8,9} concluded that home-based parenteral administration was comparable or non-inferior in terms of effectiveness and safety to hospital-based parenteral administration. One of these studies⁶ compared outpatient antimicrobial therapy (OPAT) administered by home health companies to OPAT administered by skilled nursing facilities, while another study⁹ compared healthcare administered OPAT to self-administered OPAT. The authors of these studies^{6,9} concluded that self-administered and home-based OPAT were safe and effective compared to hospital administered OPAT. Another study⁵ compared home-based OPAT to facility-based OPAT for persons who inject drugs (PWID) with both groups having similar complication rates and readmission rates. Another identified study⁷ comparing OPAT delivery at a skilled nursing facility to home-based OPAT administration concluded that the setting of OPAT delivery was associated with differences in unplanned hospitalizations and unplanned hospitalization were higher among patients who received OPAT delivery at the skilled nursing facility.

Finally, the evidence-based guideline¹⁰ from the Infectious Disease Society of America (IDSA) recommends that patients (including elderly patients) and caregivers should be allowed to administer OPAT with or without nursing support if effective monitoring is in place for adverse events and complications. Moreover, IDSA did not make recommendations as to whether PWID and infants can be treated at home with OPAT, but states this should be assessed on a case by case basis.¹⁰

References Summarized

Health Technology Assessments

1. Health Quality Ontario. Home-based subcutaneous infusion of immunoglobulin for primary and secondary immunodeficiencies: a health technology assessment. *Ont Health Technol Assess Ser.* 2017;17(16):1-86.
[PubMed: PM31210833](#)

Systematic Reviews and Meta-analyses

2. Bryant PA, Katz NT. Inpatient versus outpatient parenteral antibiotic therapy at home for acute infections in children: a systematic review. *Lancet Infect Dis.* 2018;18(2):e45-e54.
[PubMed: PM28822781](#)
3. Polinski JM, Kowal MK, Gagnon M, Brennan TA, Shrank WH. Home infusion: safe, clinically effective, patient preferred, and cost saving. *Healthc (Amst).* 2017;5(1-2):68-80.
[PubMed: PM28668202](#)

Randomized Controlled Trials

4. Ibrahim LF, Hopper SM, Orsini F, Daley AJ, Babl FE, Bryant PA. Efficacy and safety of intravenous ceftriaxone at home versus intravenous flucloxacillin in hospital for children with cellulitis (CHOICE): a single-centre, open-label, randomised, controlled, non-inferiority trial. *Lancet Infect Dis*. 2019;19(5):477-486.
[PubMed: PM30853250](#)

Non-Randomized Studies

5. D' Couto HT, Robbins GK, Ard KL, Wakeman SE, Alves J, Nelson SB. Outcomes according to discharge location for persons who inject drugs receiving outpatient parenteral antimicrobial therapy. *Open Forum Infect Dis*. 2018;5(5):ofy056-ofy056.
[PubMed: PM29766017](#)
6. Townsend J, Keller S, Tibuakuu M, et al. Outpatient parenteral therapy for complicated staphylococcus aureus infections: a snapshot of processes and outcomes in the real world. *Open Forum Infect Dis*. 2018;5(11):ofy274-ofy274.
[PubMed: PM30488039](#)
7. Schmidt M, Hearn B, Gabriel M, Spencer MD, McCurdy L. Predictors of unplanned hospitalization in patients receiving outpatient parenteral antimicrobial therapy across a large integrated healthcare network. *Open Forum Infect Dis*. 2017;4(2):ofx086-ofx086.
[PubMed: PM28638844](#)
8. Ibrahim LF, Hopper SM, Babl FE, Bryant PA. Who can have parenteral antibiotics at home?: A prospective observational study in children with moderate/severe cellulitis. *Pediatr Infect Dis J*. 2016;35(3):269-274.
[PubMed: PM26569189](#)
9. Patients Discharged from a Safety-Net Hospital: A propensity-score-balanced retrospective cohort study. *PLoS Med*. 2015;12(12):e1001922-e1001922.
[PubMed: PM26671467](#)

Guidelines and Recommendations

10. Norris AH, Shrestha NK, Allison GM, et al. 2018 IDSA clinical practice guideline for the management of outpatient parenteral antimicrobial therapy. *Clin Infect Dis*. 2019 Jan;68(1). <https://www.idsociety.org/practice-guideline/outpatient-antimicrobial-parenteral-therapy/> Accessed 2020 Feb 25.
See: Recommendations – Patient Considerations

Appendix — Further Information

Previous CADTH Reports

11. First dose intravenous antibiotic administration in home care settings: safety and guidelines. (*Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2015 Jul:
<https://cadth.ca/sites/default/files/pdf/htis/july-2015/RB0885%20Home%20IV%20Antibiotic%20First%20Dose%20Final.pdf>
Accessed 2020 Feb 25.
12. Intravenous administration of medications in home care settings: clinical evidence and guidelines. (*Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2014 Dec. <https://www.cadth.ca/media/pdf/htis/jan-2015/RB0765%20At%20Home%20IV%20Final.pdf>
Accessed 2020 Feb 25.
13. Ambulatory parenteral infusion pumps in the home care setting: safety. (*Rapid response report: reference list*). Ottawa (ON): CADTH; 2016 Aug:
<https://cadth.ca/sites/default/files/pdf/htis/aug-2016/RA0860%20Parenteral%20Infusion%20Final.pdf>
Accessed 2020 Feb 25.

Systematic Reviews

Unclear Intervention

14. Sriskandarajah S, Hobbs J, Roughead E, Ryan M, Reynolds K. Safety and effectiveness of 'hospital in the home' and 'outpatient parenteral antimicrobial therapy' in different age groups: a systematic review of observational studies. *Int J Clin Pract*. 2018:e13216-e13216.
[PubMed: PM29920884](#)

Non-Randomized Studies

No Comparator

15. Scanlan BT, Ibrahim LF, Hopper SM, Babl FE, Davidson A, Bryant PA. Selected children with complicated acute urinary tract infection may be treated with outpatient parenteral antibiotic therapy at home directly from the emergency department. *Pediatr Infect Dis J*. 2019;38(2):e20-e25.
[PubMed: PM29634622](#)

Setting Not Specified

16. Durojaiye OC, Bell H, Andrews D, Ntziora F, Cartwright K. Clinical efficacy, cost analysis and patient acceptability of outpatient parenteral antibiotic therapy (OPAT): a decade of Sheffield (UK) OPAT service. *Int J Antimicrob Agents*. 2018;51(1):26-32.
[PubMed: PM28673610](#)
17. Gil-Navarro MV, Lopez-Cortes LE, Luque-Marquez R, Galvez-Acebal J, de Alarcon-Gonzalez A. Outpatient parenteral antimicrobial therapy in *Enterococcus faecalis* infective endocarditis. *J Clin Pharm Ther*. 2018;43(2):220-223.
[PubMed: PM29030859](#)

18. Keller SC, Dzintars K, Gorski LA, Williams D, Cosgrove SE. Antimicrobial agents and catheter complications in outpatient parenteral antimicrobial therapy. *Pharmacotherapy*. 2018;38(4):476-481.
[PubMed: PM29493791](#)
19. Martens P, Vercammen J, Ceysens W, et al. Effects of intravenous home dobutamine in palliative end-stage heart failure on quality of life, heart failure hospitalization, and cost expenditure. *ESC Heart Fail*. 2018;5(4):562-569.
[PubMed: PM29341466](#)
20. Sanroma P, Muñoz P, Mirón-Rubio M, et al. Effectiveness and safety of ertapenem used in hospital-at-home units: data from Spanish Outpatient Parenteral Antimicrobial Therapy Registry. *Future Microbiol*. 2018;13:1363-1373.
[PubMed: PM30238769](#)
21. Souayah N, Pahwa A, Burawski L, Opila T, Sander HW. A retrospective analysis of the safety profile of intravenous immunoglobulin in 1176 patients receiving home infusion therapy. *J Clin Neuromuscul Dis*. 2018;19(4):181-195.
[PubMed: PM29794573](#)
22. Goldman JL, Richardson T, Newland JG, et al. Outpatient parenteral antimicrobial therapy in pediatric Medicaid enrollees. *J Pediatric Infect Dis Soc*. 2017;6(1):65-71.
[PubMed: PM26803327](#)
23. Ponce González MA, Mirón Rubio M, Mujal Martínez A, et al. Effectiveness and safety of outpatient parenteral antimicrobial therapy in acute exacerbation of chronic obstructive pulmonary disease. *Int J Clin Pract*. 2017;71(12):10.
[PubMed: PM28949430](#)
24. Rentala M, Andrews S, Tiberio A, et al. Intravenous home infusion therapy instituted from a 24-hour clinical decision unit for patients with cellulitis. *Am J Emerg Med*. 2016;34(7):1273-1275.
[PubMed: PM27182030](#)
25. Shrestha NK, Shrestha J, Everett A, et al. Vascular access complications during outpatient parenteral antimicrobial therapy at home: a retrospective cohort study. *J Antimicrob Chemother*. 2016;71(2):506-512.
[PubMed: PM26510718](#)
26. Yan M, Elligsen M, Simor AE, Daneman N. Patient characteristics and outcomes of outpatient parenteral antimicrobial therapy: a retrospective study. *Can J Infect Dis Med Microbiol*. 2016;2016:8435257-8435257.
[PubMed: PM27366183](#)