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CADTH Reference List

# Administration of Intravenous Diuretics for Acute Exacerbation of Heart Failure

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Summary of Abstracts

CADTH

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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.

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## Key Messages

- One non-randomized study was identified about the comparative clinical utility of administering IV diuretics in an outpatient IV clinic versus an emergency department setting.
- No relevant literature was identified about the comparative cost-effectiveness of administering IV diuretics in an outpatient IV clinic versus an emergency department setting.
- No evidence-based guidelines were identified about the administration of IV diuretics in outpatient IV clinic settings.

## Research Questions

1. What is the comparative clinical utility of administering IV diuretics in an outpatient IV clinic versus an emergency department setting?
2. What is the comparative cost-effectiveness of administering IV diuretics in an outpatient IV clinic versus an emergency department setting?
3. What are the evidence-based guidelines regarding the administration of IV diuretics in outpatient IV clinic settings?

## Methods

### Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Database of Systematic Reviews, the International HTA Database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were heart failure, diuretics, intravenous, and outpatient. A CADTH-developed search filter was applied to limit retrieval to guidelines for a secondary search of the concepts heart failure and diuretics. The search was completed on June 24, 2022, and limited to English-language documents published since January 1, 2017. Internet links were provided, where available.

### Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications. Open access full-text versions of evidence-based guidelines were reviewed when available, and relevant recommendations were summarized.

### Table 1: Selection Criteria

| Criteria | Description |
|---|---|
| **Population** | Individuals with acute exacerbation of heart failure |
| **Intervention** | Administration of IV diuretics in an outpatient IV clinic setting |
| **Comparator** | Q1 and Q2: Administration of IV diuretics in an emergency department setting<br>Q3: Not applicable |
| **Outcomes** | Q1: Clinical utility (e.g., hospital utilization, improved symptoms, patient quality of life, patient safety, adverse events)<br>Q2: Cost-effectiveness (e.g., quality-adjusted life-years gained [incremental cost-effectiveness ratios], cost per adverse event avoided)<br>Q3: Recommendations regarding the appropriate use of outpatient IV clinic settings (e.g., addressing barriers to access, patient population, patient care, when outpatient IV clinics should be used) |
| **Study designs** | Health technology assessments, systematic reviews, randomized-controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines |

## Results

One non-randomized study[1] was identified about the comparative clinical utility of administering IV diuretics in an outpatient IV clinic versus an emergency department setting. No relevant health technology assessments, systematic reviews, or randomized-controlled trials were identified. No economic evaluations were identified about the comparative cost-effectiveness of administering IV diuretics in an outpatient IV clinic versus an emergency department setting. No evidence-based guidelines were identified about the administration of IV diuretics in outpatient IV clinic settings.

Additional references of potential interest that did not meet the inclusion criteria are provided in Appendix 1.

## Overall Summary of Findings

One non-randomized study[1] compared patients with emergency department–identified acute decompensated heart failure who were treated with IV diuretics at an outpatient clinic to those who were treated with IV diuretics in the hospital. No differences between groups were observed in 30-to-90-day readmissions, 30-to-90-day mortality, or adverse outcomes.[1] In addition, there was a lower cost associated with using the outpatient clinic compared to in-hospital care.[1] The authors concluded that IV diuretics administered in an outpatient clinic setting is a feasible option for the treatment of acute decompensated heart failure.[1]

No relevant literature was found about the comparative cost-effectiveness of administering IV diuretics in an outpatient IV clinic versus an emergency department setting. Similarly, no evidence-based guidelines about the administration of IV diuretics in outpatient IV clinic settings were identified; therefore, no summary can be provided.

# References

## Health Technology Assessments

No literature identified.

## Systematic Reviews

No literature identified.

## Randomized Controlled Trials

No literature identified.

## Non-Randomized Studies

1. Halatchev IG, Wu WC, Heidenreich PA, et al. Inpatient versus outpatient intravenous diuresis for the acute exacerbation of chronic heart failure. *Int J Cardiol Heart Vasc*. 2021;36:100860. PubMed

## Economic Evaluations

No literature identified.

## Guidelines and Recommendations

No literature identified.

# Appendix 1: References of Potential Interest

## Previous CADTH Reports


2. Tran K, Butcher R. Heart function clinics for patients with heart failure. *(CADTH Health Technology Review). Can J Health Technol.* 2021;1(9). https://www.cadth.ca/sites/default/files/pdf/htis/2021/RC1379%20Heart%20function%20clinics%20Final.pdf. Accessed 2022 Jun 28.


## Systematic Reviews

### *Unclear Comparator*


3. Wierda E, Dickhoff C, Handoko ML, et al. Outpatient treatment of worsening heart failure with intravenous and subcutaneous diuretics: a systematic review of the literature. *ESC Heart Fail*. 2020;7(3):892-902. PubMed


## Randomized Controlled Trials

### *Unclear Comparator*


4. Hamo CE, Abdelmoneim SS, Han SY, et al. OUTpatient intravenous LASix Trial in reducing hospitalization for acute decompensated heart failure (OUTLAST). *PLoS ONE*. 2021;16(6):e0253014. PubMed


## Non-Randomized Studies

### *Alternative Comparator – Observational Hospitalization Setting*


5. St Amand A, Taveira TH, Henthorne KE, Wu WC. Ambulatory intravenous diuretic clinic associated with short-term risk reduction in mortality and rehospitalizations in patients discharged with heart failure. *R I Med J.* 2020;103(9):16-21. PubMed


### *Unclear Comparator*


6. Ahmed FZ, Taylor JK, John AV, et al. Ambulatory intravenous furosemide for decompensated heart failure: safe, feasible, and effective. *ESC Heart Fail*. 2021;8(5):3906-3916. PubMed

7. Ioannou A, Browne T, Jordan S, Metaxa S, Mandal AKJ, Missouris CG. Diuretic lounge and the impact on hospital admissions for treatment of decompensated heart failure. *QJM*. 2020;113(9):651-656. PubMed


### *No Comparator*


8. Vaishnav J, Hubbard A, Chasler JE, et al. Management of heart failure in cardiac amyloidosis using an ambulatory diuresis clinic. *Am Heart J.* 2021;233:122-131. PubMed

9. Verma V, Zhang M, Bell M, et al. Outpatient intravenous diuretic clinic: an effective strategy for management of volume overload and reducing immediate hospital admissions. *J Clin Med Res*. 2021;13(4):245-251. PubMed

10. Alghalayini KW. Effect of diuretic infusion clinic in preventing hospitalization for patients with decompensating heart failure. *SAGE Open Med.* 2020;8:2050312120940094. PubMed

11. Chambers J, Cummings A, Cuomo K, et al. Efficacy of a nurse practitioner managed outpatient intravenous diuresis clinic to relieve recurrent congestion in patients with cardiac amyloidosis. *Heart Lung*. 2020;49(2):213-214. PubMed

12. Zuzarte P, Kostiw K, Maciukiewicz M, Figueira ML, Costa-Vitali A. Outpatient disease management program for heart failure: a multidisciplinary approach with an ambulatory intravenous diuretic therapy. *Insuf Card*. 2018;13(1): 2-9. http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S1852-38622018000100002. Accessed 2022 Jun 28.


## Economic Evaluations

### *Unclear Intervention – Not Specific to IV Diuretic Administration*


13. Fitch K, Lau J, Engel T, Medicis JJ, Mohr JF, Weintraub WS. The cost impact to Medicare of shifting treatment of worsening heart failure from inpatient to outpatient management settings. *Clinicoecon Outcomes Res*. 2018;10:855-863. PubMed


## Guidelines and Recommendations

### *Unclear Methodology*


14. CorHealth Ontario. CorHealth COVID-19 heart failure memo # 1: recommendations for an Ontario approach for ambulatory monitoring & management of heart failure during COVID-19. Toronto (ON): CorHealth Ontario; 2022: https://www.corhealthontario.ca/CorHealth-COVID-19-Heart-Failure-Memo1-Recommendations-for-Managing-Heart-Failure-During-Covid-19.pdf. Accessed 2022 Jun 28.
See: Section 6, page 5

15. Maine Medical Partners; MaineHealth Cardiology. Heart failure protocol for the outpatient setting. Diuretic protocol for heart failure patients with a weight gain of greater than or equal to 4 pounds from target weight. Portland (ME): Maine Medical Partners; 2019: https://www.mainehealth.org/-/media/MaineHealth/PDFs/Heart-Care/Protocols/Heart-Failure-Protocol-Outpatient-Setting.pdf. Accessed 2022 Jun 28.
See: Protocol Statement 3, page 1

## Review Articles

16. Girerd N, Mewton N, Tartiere JM, et al. Practical outpatient management of worsening chronic heart failure. *Eur J Heart Fail*. 2022;24(5):750-761. PubMed

17. Wand A., Russell SD, Gilotra NA. Ambulatory management of worsening heart failure: current strategies and future directions. *Heart Int*. 2021;15(1):49-53. https://www.touchcardio.com/wp-content/uploads/sites/4/2021/07/touchCARDIO_HI_15.1_pp49-53.pdf. Accessed 2022 Jun 28.

18. Greene SJ, Mentz RJ, Felker GM. Outpatient worsening heart failure as a target for therapy: a review. *JAMA Cardiol*. 2018;3(3):252-259. PubMed