

CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Portable versus Fixed X-ray Equipment: Clinical and Cost-Effectiveness, and Guidelines

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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.

Research Questions

1. What is the clinical effectiveness of portable x-ray imaging equipment versus fixed x-ray equipment?
2. What is the cost-effectiveness of portable x-ray imaging equipment versus fixed x-ray equipment?
3. What are the evidence-based guidelines regarding the use of portable x-ray equipment?

Key Findings

Two economic evaluations were identified regarding the clinical and cost-effectiveness of portable versus fixed x-ray imaging. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, or evidence-based guidelines were identified.

Methods

This report makes use of a literature search strategy developed for a previous CADTH report. For the current report, a limited literature search was conducted on key resources including PubMed, OVID, the Cochrane Library, 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 retrieval by study type. Where possible, retrieval was limited to the human population. The search was limited to English-language documents published between January 1, 2015 and January 8, 2019 to capture any articles published since the previous report.

Selection Criteria

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

Table 1: Selection Criteria

Population	Patients in the community requiring home / mobile x-ray imaging (e.g., chest, joint, or limb)
Intervention	Portable / In home x-ray imaging (e.g., Leonardo x-ray device)
Comparator	Fixed x-ray imaging
Outcomes	Clinical effectiveness (e.g. image quality, time to result, diagnostic accuracy, changes in clinical outcomes, validity); Cost-effectiveness; Evidence-based guidelines
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, economic evaluations, evidence-based guidelines

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, economic evaluations, and evidence-based guidelines.

Two economic evaluations were identified regarding the cost-effectiveness of portable versus fixed x-ray imaging. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Two economic evaluations^{1,2} were identified regarding the cost-effectiveness of portable versus fixed x-ray imaging. The authors of both evaluations^{1,2} found that portable x-ray imaging was a safe, accessible, and cost-effective method to capture diagnostic images in comparison to in-hospital based imaging. One study¹ used a decision model to compare hospital-based imaging and mobile radiography services with hospital-based imaging alone for nursing home residents. The authors found that there was a 30% cost-reduction by implementing the mobile radiography service for nursing home residents.¹ The authors of the prospective cost-minimization analysis² compared mobile radiography in elderly care facilities with hospital-based radiology examinations and found that mobile radiography reduced costs significantly per examination as well as total health-care related costs.² Overall, mobile radiography was found to significantly reduce health care costs compared to hospital-based radiography.

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

Economic Evaluations

1. Kjelle E, Kleven L, Olerud HM, Melberg HO. Cost analysis of mobile radiography services for nursing home residents in Southeast Norway. *J Eval Clin Pract.* 2018 Oct 26.
[PubMed: PM30362207](#)

2. Dozet A, Ivarsson B, Eklund K, Klefsgard R, Geijer M. Radiography on wheels arrives to nursing homes - an economic assessment of a new health care technology in southern Sweden. *J Eval Clin Pract.* 2016 Dec;22(6):990-997.
[PubMed: PM27412082](#)

Guidelines and Recommendations

No literature identified

Appendix — Further Information

Previous CADTH Reports

3. Portable versus fixed X-ray equipment: a review of the clinical effectiveness, cost-effectiveness, and guidelines. (*CADTH Rapid response report: summary with critical appraisal*). Ottawa (ON): CADTH; 2016: <https://www.cadth.ca/portable-versus-fixed-x-ray-equipment-review-clinical-effectiveness-cost-effectiveness-and> . Accessed 2019 Jan 15.
4. Mobile X-ray imaging versus fixed x-ray imaging in long-term care: clinical and cost-effectiveness. (*CADTH Rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2014: <https://www.cadth.ca/mobile-x-ray-imaging-versus-fixed-x-ray-imaging-long-term-care-clinical-and-cost-effectiveness> . Accessed 2019 Jan 15.

Systematic Reviews – Alternative Comparator

5. Kjelle E, Lysdahl KB. Mobile radiography services in nursing homes: a systematic review of residents' and societal outcomes. *BMC Health Serv Res*. 2017 Mar 23;17(1):231.
[PubMed: PM28335759](#)

Non-Randomized Studies – Alternative Comparator and Setting

6. Tonna JE, Kawamoto K, Presson AP, et al. Single intervention for a reduction in portable chest radiography (pCXR) in cardiovascular and surgical/trauma ICUs and associated outcomes. *J Crit Care*. 2018 Apr;44:18-23.
[PubMed: PM29024879](#)
7. Cant J, Snoeckx A, Behiels G, Parizel PM, Sijbers J. Can portable tomosynthesis improve the diagnostic value of bedside chest X-ray in the intensive care unit? A proof of concept study. *Eur Radiol Exp*. 2017;1(1):20.
[PubMed: PM29708195](#)
8. Ngan TL, Wong ETH, Ng KLS, Jeor PKS, Law MYY, Lo GG. Key performance indicators for comparing the performance of portable radiography: direct digital radiography versus conventional machine computed radiography - A study in a Nonacute hospital. *J Med Imaging Radiat Sci*. 2014;45(2):105-114.
<https://www.sciencedirect.com/science/article/pii/S1939865413001069> . Accessed 2019 Jan 15.

Qualitative Studies

9. Vigeland E, Bohm RE, Rostad A, Lysdahl KB. Mobile x-ray service for nursing homes. *Tidsskr Nor Laegeforen*. 2017 02;137(3):198-202.
[PubMed: PM28181756](#)

Additional References

10. Gretton C, Honeyman M. The Digital revolution: eight technologies that will change health and care. *The King's Fund* 2016;
<https://www.kingsfund.org.uk/publications/eight-technologies-will-change-health-and-care>. Accessed 2019 Jan 15.