

CADTH RAPID RESPONSE REPORT: REFERENCE LIST

Remote Access Technologies versus Interfacility Transportation in Rural and Remote Settings: Clinical Effectiveness, 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 comparative clinical effectiveness of remote access technologies versus interfacility transportation for patients requiring care in rural and remote settings?
2. What is the comparative cost-effectiveness of remote access technologies versus interfacility transportation for patients requiring care in rural and remote settings?
3. What are the evidence-based guidelines associated with the use of remote access technologies for patients requiring care in rural and remote settings?

Key Findings

Two randomized controlled trials, four non-randomized studies, one economic evaluation, and one evidence based guideline were identified regarding remote access technologies for patients requiring care in rural or remote settings. No relevant health technology assessments, systematic reviews or meta-analyses were identified.

Methods

A limited literature search was conducted on key resources including PubMed, 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. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, economic studies and guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2013 and November 13, 2018. 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	Patient who require access to care in rural in remote settings
Intervention	Remote access technologies (i.e., robotic technologies, video conference technologies, telemedicine)
Comparator	Q1-Q2: Interfacility transportation (i.e., travelling for care) Q3: No comparator required

Outcomes	Q1: Quality of patient care, clinical benefit (i.e., improved health outcomes), harms (i.e., rate of adverse events), accuracy of diagnoses and treatment plans. Q2: Cost-effectiveness Q3: Evidence-based guidelines
Study Designs	Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials (RCT), non-randomized studies, economic evaluations, and guidelines.

Results

Two randomized controlled trials, four non-randomized studies, one economic evaluation and one evidence based guideline were identified in the search regarding remote access technology for patients needing care in rural or remote areas. No relevant health technology assessments, systematic reviews or meta-analyses were identified.

Additional references of potential interest are provided in the appendix.

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified,

Randomized Controlled Trials

1. Buvik A, Bugge E, Knutsen G, Smabrekke A, Wilsgaard T. Quality of care for remoteorthopaedic consultations using telemedicine: a randomised controlled trial. BMC Health Serv Res. 2016 Sep 8;16:483.
[PubMed: PM27608768](#)
2. Boman K, Olofsson M, Berggren P, Sengupta PP, Narula J. Robot-assisted remote echocardiographic examination and teleconsultation: a randomized comparison of time to diagnosis with standard of care referral approach. JACC Cardiovasc Imaging. 2014 Aug;7(8):799-803.
[PubMed: PM25124011](#)

Non-Randomized Studies

3. Holt T, Sari N, Hansen G, et al. Remote presence robotic technology reduces need for pediatric interfacility Transportation from an Isolated Northern Community. Telemed J E Health. 2018 Feb 2.
[PubMed: PM29394155](#)
4. Mohr NM, Young T, Harland KK, et al. Emergency department telemedicine shortens rural time-to-provider and emergency department transfer times. Telemed J E Health. 2018 Aug;24(8):582-593.
[PubMed: PM29293413](#)

5. Robinson JD, Prochaska JD, Yngve DA. Pre-surgery evaluations by telephone decrease travel and cost for families of children with cerebral palsy. *SAGE open medicine*. 2017;5:2050312117720046.
[PubMed: PM28839936](#)
6. Muller KI, Alstadhaug KB, Bekkelund SI. Acceptability, feasibility, and cost of telemedicine for nonacute headaches: A randomized study comparing video and traditional consultations. *J Med Internet Res*. 2016 May 30;18(5):e140.
[PubMed: PM27241876](#)

Economic Evaluations

7. Jacups SP, Kinchin I, McConnon KM. Ear, nose, and throat surgical access for remote living Indigenous children: What is the least costly model? *J Eval Clin Pract*. 2018 Oct 12.
[PubMed: PM30311714](#)

Guidelines and Recommendations

8. Blacquiere D, Lindsay MP, Foley N, et al. Canadian Stroke Best Practice Recommendations: Telestroke best practice guidelines Update 2017. *Int J Stroke*. 2017 Oct;12(8):886-895.
[PubMed: PM28441928](#)

Appendix — Further Information

Previous CADTH Reports

9. New technologies that support the delivery of health care in rural and remote areas. (CADTH Health technology update, Iss 2). Ottawa (ON): CADTH; Aug 2018. <https://www.cadth.ca/health-technology-update-issue-21> Accessed 2018 Nov 20.
10. Technologies assisting in remote consultations for the diagnosis of stroke: A review of the clinical evidence. (CADTH Rapid response report: Summary with critical appraisal). Ottawa (ON): CADTH; Nov 2013. <https://www.cadth.ca/technologies-assisting-remote-consultations-diagnosis-stroke-review-clinical-evidence> Accessed 2018 Nov 20
11. Bittner AK, Wykstra SL, Yoshinaga PD, Li T. Telerehabilitation for people with low vision. Cochrane Database Syst Rev. 2015 Aug 31;8:CD011019. <https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD011019.pub2/full> Accessed 2018 Nov 20
12. Isaac M, Isaranuwachai W, Tehrani N. Cost analysis of remote telemedicine screening for retinopathy of prematurity. Can J Ophthalmol. 2018 Apr;53(2):162-167. [PubMed: PM29394155](https://pubmed.ncbi.nlm.nih.gov/29394155/)

Review Articles

13. Kataria S, Ravindran V. Digital health: a new dimension in rheumatology patient care. Rheumatol Int. 2018 Nov;38(11):1949-1957. [PubMed: PM29713795](https://pubmed.ncbi.nlm.nih.gov/29713795/)
14. Kornelsen J, McCartney K, Netwon L et al. Rural patient transport and transfer: Findings from a realist review. Vancouver (BC): Applied Policy Research Unit. Nov 2016. <https://www.divisionsbc.ca/sites/default/files/Divisions/Rural%20and%20Remote/Rural%20Patient%20Transport%20Report%20-%20FINAL.pdf> Accessed 2018 Nov 20.
15. Velasquez SE, Chaves-Carballo E, Nelson EL. Pediatric teleneurology: A model of epilepsy care for rural populations. Pediatr Neurol. 2016 Nov;64:32-37. [PubMed: PM27742162](https://pubmed.ncbi.nlm.nih.gov/27742162/)
16. Krupinski EA. Innovations and possibilities in connected health. J Am Acad Audiol. 2015 Oct;26(9):761-767. [PubMed: PM26415969](https://pubmed.ncbi.nlm.nih.gov/26415969/)

Additional References

17. Mechanic OJ, Kimball AB. Telehealth systems. Treasure Island (FL): StatPearls Publishing. 2018 May 13. <https://www.ncbi.nlm.nih.gov/books/NBK459384/> Accessed 2018 Nov 20.
18. CareLink network service for remote monitoring of people with cardiac devices [MIB64]. London (GB): National Institute for Health and Care Excellence. May 2016. <https://www.nice.org.uk/advice/mib64> Accessed 2018 Nov 20.

19. Queensland rural and remote health service framework: Final draft. Brisbane (AU): Queensland Government Department of Health; 2013.
https://www.health.qld.gov.au/_data/assets/pdf_file/0032/432878/randr_hsp_framework.pdf Accessed 2018 Nov 20.