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CADTH RAPID RESPONSE REPORT: SUMMARY OF ABSTRACTS

Telehealth and Mobile Services for Substance Use Disorder: 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.

Funding: CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

Research Questions

1. What is the clinical effectiveness of telehealth-delivered interventions and mobile (moveable) services in the management of substance use disorder?
2. What is the cost-effectiveness of telehealth-delivered interventions and mobile (moveable) services in the management of substance use disorder?
3. What are the evidence-based guidelines regarding telehealth-delivered interventions and mobile (moveable) services in the management of substance use disorder?

Key Findings

Two systematic reviews and eight non-randomized studies were identified regarding the clinical effectiveness of telehealth-delivered interventions and mobile services in the management of substance use disorder. No relevant economic evaluations or evidence-based guidelines were identified regarding telehealth-delivered interventions and mobile (moveable) services in the management of substance use disorder.

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 opioids, telemedicine and mobile health units. No filters were applied to limit the retrieval by study type. The search was also limited to English language documents published between January 1, 2015 and January 9, 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	Adults with substance use disorder with or without other co-occurring mental health or addictions issues
Intervention	Telehealth interventions (e.g., telehealth-based opioid agonist therapy, telehealth-based mental health services, telehealth-based combined therapies) Mobile health services (i.e., moveable services, such as Mobile Outreach Street Health (MOSH) in Halifax; mobile pharmacies providing opioid agonist therapies and mental health interventions; mobile supervised injection sites; mobile needle exchanges)

Comparator	Q1-2: No treatment (no substance use disorder treatment); standard or usual care delivered in-person, in static locations (including opioid agonist therapy); No comparator (before and after studies) Q3: No comparator
Outcomes	Q1: Clinical effectiveness (e.g., changes in overdoses, retention, compliance, safety [patient harms and benefits], change in health status, change in symptoms, quality of life) Q2: Cost-effectiveness (e.g., cost per hospitalization avoided, cost per overdose avoided, cost per quality-adjusted life year [QALY] increase) Q3: Recommendations
Study Designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, 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 and systematic reviews are presented first. These are followed by randomized controlled trials, non-randomized studies, economic evaluations, and evidence-based guidelines.

Two systematic reviews[1-2] and eight non-randomized studies[3-10] were identified regarding the clinical effectiveness of telehealth-delivered interventions and mobile services in the management of substance use disorder. No relevant health technology assessments, randomized controlled trials, economic evaluations, or evidence-based guidelines were identified.

Additional references of potential interest are provided in the appendix.

Overall Summary of Findings

Two systematic reviews[1-2] and eight non-randomized studies[3-10] were identified regarding the clinical effectiveness of telehealth-delivered interventions and mobile services in the management of substance use disorder. Many studies demonstrated that telehealth or mobile health interventions improved treatment retention, adherence, and relapse prevention in patients with substance use.[1-3,5,6,8,10] However, the author of one study[9] found that there was no significant difference in treatment retention, abstinence, and substance use between telepsychiatry and in person treatment, while another study reported no significant difference in mental illness and substance use compared to standard care.[3] The authors of two non-randomized studies[4,7] assessed mobile harm reduction units administering hepatitis C virus (HCV) treatment to persons using or injecting drugs. The authors found that HCV reinfection was higher in those who injected drugs in the past 6 months,[4] and that HCV seroconversion (i.e. HCV infection) was not associated with methadone status.[7] The authors concluded that HCV treatment was efficacious preventing HCV reinfection in persons who use drugs attending low threshold mobile harm reduction units.[4] Detailed study characteristics are provided in Table 2.

Table 2: Summary of Included Studies on Telehealth-delivered interventions and Mobile Services

First Author, Year	Study Characteristics (N= # of patients)	Interventions	Comparators	Outcomes	Conclusions
Systematic Reviews					
Jiang 2017[1]	• 25 studies (22 RCT) • 11 studies for telecommunication	Telephone MI	NR	• Treatment • Prevention	Multiple studies supported the effectiveness of telephone MI to treat and prevent substance abuse
Tofighi 2017[2]	• 11 studies	Text Messaging Intervention	NR	• Clinical outcomes • Treatment adherence • Peer support engagement • Relapse prevention	Text messaging interventions demonstrated improved clinical outcomes, medication adherence, peer support group engagement; it also intervened on relapse prevention and appointment attendance
Non-Randomized Studies					
Legha 2019[3]	• Matched case-control study • N=103 cases and 103 controls	Telepsychiatry	No treatment	• LOS • ER visits • Hospital admissions • Clinical history • Mental health • Substance abuse diagnosis • Treatment compliance	Telepsychiatry patients had higher treatment compliance, greater likelihood to complete treatment, and fewer discharges against medical advice. However, PTSD and history of violence was higher in cases and no significant difference was found in mental health, medical illness, socioeconomic challenges or substance abuse.
Valencia 2019[4]	• Prospective study • N=160 PWUD in the past 6 months	Mobile harm reduction units administering HCV treatment	No treatment	• HCV re-infection	HCV treatment was efficacious; Incidence of HCV reinfection was higher in those who injected drugs in the past 6 months
Weintraub 2018[5]	• Retrospective chart review • N=177 • Setting: Rural drug treatment center	Telemedicine delivered buprenorphine treatment	No treatment	• Treatment retention • Substance abuse	Buprenorphine was effectively delivered via telemedicine. Treatment retention was “98% at 1 week, 91% at 1 month, 73%

First Author, Year	Study Characteristics (N= # of patients)	Interventions	Comparators	Outcomes	Conclusions
					at 2 months, and 57% at 3 months"; 86% had negative opioid urine tests
Cousins 2018[6]	• Retrospective study • N=NR • 5 years	Medication hub administering XR-NTX	No treatment	• Treatment adherence	Significant increase in utilization of medication assisted treatment (89%) and initiation (59%)
Valencia 2018[7]	• Prospective cohort • N=940 PWUD	Mobile harm reduction unit	No treatment	• HCV seroconversion/infection	Methadone status was not associated with HCV seroconversion however injecting drugs in the past year was strongly associated.
Eibl 2017[8]	• Retrospective cohort • N=3733	Telemedicine delivered OAT	In person treatment	• Treatment retention	Treatment retention was greater in the telemedicine group (50% at 1 year) versus the in-person treatment group (39% at 1 year). The mixed group (25-75% by telemedicine) also had higher likelihood of retention than the in-person group (47% at 1 year).
Zheng 2017[9]	• Retrospective study • N=100	Telepsychiatry / videoconference delivered buprenorphine MAT	In person treatment	• Substance use • Time to abstinence from drug use • Treatment retention	No significant difference
Guarino 2016[10]	• Mixed methods pilot study • N=25 MMT patients	Mobile psychosocial intervention and MMT	MMT alone	• Substance use • Patient satisfaction • Treatment retention • Abstinence from drug use	Participants in the intervention group reported significantly greater satisfaction and usefulness and demonstrated increased treatment retention and abstinence from illicit opioid drugs versus MMT alone

HCV = Hepatitis C virus; MAT = medication assisted treatment; MI = motivational interviewing; MMT = methadone maintenance treatment; NR = not reported; OAT = opioid agonist therapy; PWUD = people who use drugs; XR-NTX = extended-release naltrexone

References Summarized

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

1. Jiang S, Wu L, Gao X. Beyond face-to-face individual counseling: a systematic review on alternative modes of motivational interviewing in substance abuse treatment and prevention. *Addict Behav*. 2017 Oct;73:216-235.
PubMed: PM28554033

2. Tofighi B, Nicholson JM, McNeely J, Muench F, Lee JD. Mobile phone messaging for illicit drug and alcohol dependence: a systematic review of the literature. *Drug Alcohol Rev*. 2017 Jul;36(4):477-491.
PubMed: PM28474374

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

3. Legha RK, Moore L, Ling R, Novins D, Shore J. Telepsychiatry in an Alaska native residential substance abuse treatment program. *Telemed J E Health*. 2019 Dec 4.
PubMed: PM31804905

4. Valencia J, Alvaro-Meca A, Troya J, et al. High rates of early HCV reinfection after DAA treatment in people with recent drug use attended at mobile harm reduction units. *Int J Drug Policy*. 2019 Oct;72:181-188.
PubMed: PM31253391

5. Weintraub E, Greenblatt AD, Chang J, Himelhoch S, Welsh C. Expanding access to buprenorphine treatment in rural areas with the use of telemedicine. *Am J Addict*. 2018 Dec;27(8):612-617.
PubMed: PM30265425

6. Cousins SJ, Crevecoeur-MacPhail D, Kim T, Rawson RA. The Los Angeles County hub-and-provider network for promoting the sustained use of extended-release naltrexone (XR-NTX) in Los Angeles County (2010-2015). *J Subst Abuse Treat*. 2018 Feb;85:78-83.
PubMed: PM28291571

7. Valencia La Rosa J, Ryan P, Alvaro-Meca A, et al. HCV seroconversion in a cohort of people who use drugs followed in a mobile harm reduction unit in Madrid: Breaking barriers for HCV elimination. *PLoS One*. 2018;13(10):e0204795.
PubMed: PM30281616

8. Eibl JK, Gauthier G, Pellegrini D, et al. The effectiveness of telemedicine-delivered opioid agonist therapy in a supervised clinical setting. *Drug Alcohol Depend*. 2017 Jul 1;176:133-138.
PubMed: PM28535455

9. Zheng W, Nickasch M, Lander L, et al. Treatment outcome comparison between telepsychiatry and face-to-face buprenorphine medication-assisted treatment for opioid use disorder: a 2-year retrospective data analysis. *J Addict Med*. 2017 Mar/Apr;11(2):138-144.
PubMed: PM28107210

10. Guarino H, Acosta M, Marsch LA, Xie H, Aponte-Melendez Y. A mixed-methods evaluation of the feasibility, acceptability, and preliminary efficacy of a mobile intervention for methadone maintenance clients. *Psychol Addict Behav*. 2016 Feb;30(1):1-11.
PubMed: PM26618796

Economic Evaluations

No literature identified.

Guidelines and Recommendations

No literature identified.

Appendix — Further Information

Previous CADTH Reports

11. Evidence on opioids (*CADTH evidence bundle*). Ottawa (ON): CADTH; 2019 Nov: https://www.cadth.ca/evidence-bundles/opioid-evidence-bundle Accessed 2020 Jan 23.

12. Gray C, Banerjee S, Argáez C. Treatment programs for opioid use disorders: a review of guidelines (*CADTH rapid response report: summary with critical appraisal*). Ottawa (ON): CADTH; 2018 Aug: https://www.cadth.ca/sites/default/files/pdf/htis/2018/RC1010%20Treatment%20Programs%20for%20Opioid%20Use%20Disorders%20Final.pdf Accessed 2020 Jan 23.

13. Ho C, Argáez C. Telehealth-delivered opioid agonist therapy for the treatment of adults with opioid use disorder: review of clinical effectiveness, cost-effectiveness, and guidelines (*CADTH rapid response report: summary with critical appraisal*). Ottawa (ON): CADTH; 2018 Oct: https://www.cadth.ca/sites/default/files/pdf/htis/2019/RC1026%20opioid%20agonist%20therapy%20Final.docx.pdf Accessed 2020 Jan 23.

14. Optimal evidence-based therapies for the treatment of addictions: clinical effectiveness and guidelines (*CADTH rapid response report: summary of abstracts*). Ottawa (ON): CADTH; 2016 Jan. https://www.cadth.ca/sites/default/files/pdf/htis/jan-2016/RB0952%20Addiction%20Treatment%20Final.pdf

Systematic Reviews

Alternative Outcome

15. Lin LA, Casteel D, Shigekawa E, Weyrich MS, Roby DH, McMenamin SB. Telemedicine-delivered treatment interventions for substance use disorders: a systematic review. *J Subst Abuse Treat*. 2019 Jun;101:38-49. PubMed: PM31006553

16. Tofighi B, Isaacs N, Byrnes-Enoch H, et al. Expanding treatment for opioid use disorder in publicly funded primary care clinics: exploratory evaluation of the NYC health+hospitals buprenorphine ECHO program. *J Subst Abuse Treat*. 2019 Nov;106:1-3. PubMed: PM31540604

Randomized Controlled Trials

Alternative Population

17. Timko C, Below M, Vittorio L, et al. Randomized controlled trial of enhanced telephone monitoring with detoxification patients: 3- and 6-month outcomes. *J Subst Abuse Treat*. 2019 Apr;99:24-31. PubMed: PM30797391

Alternative Comparator

18. Aharonovich E, Sarvet A, Stohl M, et al. Reducing non-injection drug use in HIV primary care: a randomized trial of brief motivational interviewing, with and without HealthCall, a technology-based enhancement. *J Subst Abuse Treat*. 2017 Mar;74:71-79.
PubMed: PM28132704

Study Protocol

19. Metrebian N, Weaver T, Pilling S, et al. Telephone delivered Incentives for Encouraging adherence to Supervised methadone consumption (TIES): study protocol for a feasibility study for an RCT of clinical and cost effectiveness. *Contemp Clin Trials Commun.* 2020 Mar;17:100506.
PubMed: PM31909291

20. Long J, Yuan JM, Johnson RK. A shared decision-making tool to prevent substance abuse: protocol for a randomized controlled trial. *JMIR Res Protoc*. 2018 Jan 11;7(1):e5.
PubMed: PM29326094

21. Gordon MS, Vocci FJ, Fitzgerald TT, O'Grady KE, O'Brien CP. Extended-release naltrexone for pre-release prisoners: a randomized trial of medical mobile treatment. *Contemp Clin Trials*. 2017 Feb;53:130-136.
PubMed: PM28011389

Non-Randomized Studies - Alternative Outcome

22. Darfler K, Sandoval J, Pearce Antonini V, Urada D. Preliminary results of the evaluation of the California Hub and Spoke Program. *J Subst Abuse Treat*. 2020 Jan;108:26-32.
PubMed: PM31400985

23. Jensen AN, Beam CM, Douglass AR, Brabson JE, Colvard M, Bean J. Description of a pharmacist-led clinical video telehealth group clinic for opioid overdose prevention and naloxone education. *Ment Health Clin*. 2019 Jul;9(4):294-297.
PubMed: PM31293850

24. Yates D, Frey T, Montgomery JC. Utilizing risk index for overdose or serious opioid-induced respiratory depression (RIOSORD) scores to prioritize offer of rescue naloxone in an outpatient veteran population: a telephone-based project. *Subst Abus*. 2018;39(2):182-184.
PubMed: PM29578839

25. LaBelle B, Franklyn AM, Pkh Nguyen V, Anderson KE, Eibl JK, Marsh DC. Characterizing the use of telepsychiatry for patients with opioid use disorder and cooccurring mental health disorders in Ontario, Canada. *Int J Telemed Appl.* 2018 Feb 11;2018:7937610.
PubMed: PM29610570

Review Articles

26. Strike C, Miskovic M. Scoping out the literature on mobile needle and syringe programs-review of service delivery and client characteristics, operation, utilization, referrals, and impact. *Harm Reduct J*. 2018 Feb 8;15(1):6.
PubMed: PM29422042

27. Huskamp HA, Busch AB, Souza J, et al. How Is Telemedicine being used In opioid and other substance use disorder treatment? *Health Aff (Millwood)*. 2018 Dec;37(12):1940-1947.
PubMed: PM30633671

28. Gates P, Albertella L. The effectiveness of telephone counselling in the treatment of illicit drug and alcohol use concerns. *J Telemed Telecare*. 2016 Mar;22(2):67-85.
PubMed: PM26026185