



**Evidence Snapshot**

# The effectiveness of opioid treatment delivery methods

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An Evidence Snapshot brokered by the Sax Institute for the NSW Ministry of Health.  
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This updated report was prepared by: Deshanie Rawlings, Gabriel Moore, Anton du Toit, Hyun Song, Eileen Goldberg, Moin Uddin Ahmed, and Hir S Jani, with content expertise provided by Tanya Bosch, NSW Ministry of Health. May 2022.

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**Enquiries regarding this report may be directed to the:**

Manager  
Knowledge Exchange Program  
Sax Institute  
[www.saxinstitute.org.au](http://www.saxinstitute.org.au)  
[knowledge.exchange@saxinstitute.org.au](mailto:knowledge.exchange@saxinstitute.org.au)  
Phone: +61 2 9188 9500

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# Introduction

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This Evidence Snapshot rapid review was commissioned by the NSW Ministry of Health and prepared by the Sax Institute. Note that it was completed within a short time, so while a rigorous process for searching was followed it is possible that some peer reviewed or grey literature may have been missed.

The NSW Opioid Treatment Program (OTP) has had marked success in assisting opioid dependent people to reduce or cease opioid use, improve their quality of life and prevent harms associated with opioid use. Notwithstanding this success, the OTP faces challenges associated with:

- Improving access to treatment
- Safety and quality and
- Program sustainability.

Together with key stakeholders, and in the context of limited resourcing, the Centre for Alcohol and Other Drugs (CAOD) developed a Strategic Action Plan to enhance the Program across these three high level focus areas. Action 3.2.4 in the Plan is “Investigate innovative models of care such as shared care, outreach bus, NP/nurse-led clinics, unsupervised dosing for buprenorphine, public-private partnership, social enterprises”.

This Evidence Snapshot review was commissioned to identify innovative and cost-effective models of service delivery for OTP.

## Review question

**What is the evidence for the effectiveness of opioid treatment delivery models and what are their costs?**

## Methods

We searched PubMed, CINAHL and Scopus for peer-reviewed literature as well as an extensive grey literature search. This included the UK Department of Health and Social Care, NZ Ministry of Health, US CDC, German Federal Ministry of Health, Swedish Ministry of Health and Social Affairs, the King’s Fund, and the Oxford Centre for Evidence Based-Medicine, as well as several combinations of search terms on Google, filtered by country.

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We reviewed the title and abstracts of n=211 peer reviewed papers. The peer reviewed literature searches were undertaken on 2<sup>nd</sup> to 9<sup>th</sup> November 2021, and the grey literature searches were completed on 9<sup>th</sup> December 2021. Peer reviewed and grey literature was sourced by 5pm on 10<sup>th</sup> December 2021.

We report our full results in Appendices 3 and 4.

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# Summary of findings

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## Findings

### Peer reviewed literature

- We identified twenty-six papers of which seven were evaluations (1-7), five were commentaries or editorials (8-12), four were reviews (13-16), four were qualitative studies (17-20), three were trials (21-23), two were observational studies (24, 25), and one was a study protocol.(26) All studies were conducted in the United States except for three, of which two were conducted in Canada (1, 13) and one in Finland.(16)
- Effectiveness, defined as 'meeting the goals of the client', was not measured in any of the included studies. Only two studies reported client-related outcomes: one was a feasibility trial of physician-pharmacist collaboration that measured participant safety and satisfaction (23); the other was an evaluation of a primary care model which measured areas of functioning and satisfaction-with-life.(4) None of the studies reported costs.
- The most frequently reported outcomes were: number of clients treated (n=6 studies) (2, 6, 15, 19, 23, 24); retention in treatment (n=7 studies) (6, 8, 13, 14, 23, 24, 27), adherence to treatment (n=2 studies) (23, 25); continued drug use (n=4 studies) (1, 6, 22, 23); and abstinence (n=2 studies). (4, 14)
- Innovative models of opioid treatment delivery to expand access identified in the literature were: primary care, digital health, low threshold, group-based treatment, and mobile outreach as well as combinations of these models (e.g., digital health and low threshold care or digital health and primary care). Digital health models were the most frequently mentioned.

### Grey literature

- Eleven papers from the grey literature were selected for inclusion of which seven were website publications (28-34), two were policy papers (35, 36), one was an environmental scan for the Canadian Agency for Drugs and Technologies in Health (37) and one was a technical brief for the Agency for Healthcare Research and Quality (AHRQ) US (38).
- Effectiveness, defined as 'meeting the goals of the client', was not measured in any of the included studies. None of the papers included mentioned costs.
- Models of opioid treatment to expand access mentioned in the grey literature were the same as in the peer review: primary care, digital health, low threshold, group-based treatment and mobile outreach.

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## Key messages

### Peer reviewed literature

#### *Effective models of opioid treatment and their costs*

- Innovative models of opioid treatment to expand access identified in the literature were digital health (n=7), primary care (n=6), low threshold (n=2), group-based treatment (n=2), and mobile outreach (n=2), as well as a combination of these models. Telemedicine models were most frequently mentioned as being innovative as these addressed many traditional barriers to treatment and increased access to treatment, particularly for rural and hard to reach communities. Primary care models were also identified as being innovative and leveraged the roles of nonphysician staff to increase access to treatment.
- Effectiveness, defined as meeting the goals of the client, was not measured in any of the included studies. None of the studies reported costs.
- The lack of evidence for effectiveness in peer reviewed points to the need for evaluation of opioid treatment delivery models with a focus on client-related outcomes.
- The degree of heterogeneity in the models suggests that treatment delivery is sensitive to local needs. The policy context of the country in which the study was conducted must be taken into consideration when assessing innovative models for the Australian context. This is particularly the case as all but three peer reviewed studies were conducted in the US.

### Grey literature

- Innovative models of opioid treatment to expand access identified in the grey literature were primary care (n=5), digital health (n=4), low threshold (n=1), group-based treatment (n=1), and mobile outreach (n=2). None of the papers included mentioned costs.
- Primary care models to expand access to treatment were most frequently mentioned as using innovative approaches which included the use of designated nonphysician staff to perform the care coordination role and tiered care models with centralised intake and stabilisation of patients with ongoing management in community settings.
- The Shared Care for Opioid Treatment (SCOT) Project's shared care model (34) appeared to be most relevant due to applicability to the Australian context.

## Description of treatment delivery models

### Peer reviewed literature

#### *Digital health*

- Digital health models encompass a range of technologies for treatment including telemedicine models (n=5) and mobile health or application-based interventions (n=2). The COVID-19 pandemic compounded barriers to accessing treatment which led to the regulatory changes in the US with requirements for an in-person examination to prescribe buprenorphine temporarily waived. This in turn led to innovative models of treatment, particularly in digital health. Telemedicine models were rapidly implemented and increased
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access to treatment by eliminating many traditional barriers to treatment (e.g., lack of prescribers, long wait times, lack of transport or childcare, stigma).

- Two harm reduction primary care programs in New York State (one rural and one urban) rapidly adopted telemedicine to initiate buprenorphine treatment and reported eliminating many traditional barriers to treatment.(11) A pilot program suggested that access to treatment can be expanded in rural areas through a mental healthcare model which links patients to an addiction psychiatrist via videoconference.(6)
- Clark et al established a 24-hour telephone hotline which functioned as a “tele-bridge” clinic which linked patients with a prescriber in real-time for assessment and unobserved buprenorphine initiation with connection to follow-up if appropriate (a digital health and low threshold model). This was shown to improve buprenorphine access.(8) Tringale et al reported on Homeless Health Care Los Angeles’ implementation of a novel “telephone booth” model that allowed socially distanced on-site treatment of syringe exchange patients which addressed the barriers of using traditional telemedicine approaches with people living on the streets or in homeless shelters.(9) Homeless Health Care Los Angeles also transitioned from on-site direct dispensing to off-site collection from participating pharmacies (a digital health and primary care model). (9)
- Another digital health and primary care model reported in the literature was the Project Extension for Community Healthcare Outcomes (ECHO).(5) Project ECHO offers primary care providers training through a video conferencing platform led by addiction specialists. The findings by Tofighi et al suggest that Project ECHO is feasible, however, improvements in buprenorphine prescribing were minimal post-training.
- Interactive computer and text message–delivered interventions to improve adherence to treatment have been shown to be acceptable and feasible. While the sample size was small (n=24), participants universally endorsed this program as a highly accessible, useful, and supportive tool to overcome challenges that may arise in the early phase of recovery.(18)
- ReSET-O, an FDA-cleared, prescription digital therapeutic for improving retention was found reduce healthcare resource utilisation. It delivers a form of evidence-based neurobehavioral therapy founded on the community reinforcement approach.(27)

### **Primary care**

- Primary care models which were led by pharmacists or nurses were the most frequently mentioned in the studies included (n=6). These include collaborations between physicians and pharmacists; hub and spoke models, and health home models. These models were identified as innovative approaches which increased access to treatment by leveraging the roles of nonphysician staff in primary care.
- A narrative review by Bach et al (13) described novel programs designed to expand access to treatment by leveraging the role of community pharmacists and noted that Australia had already adopted this approach. Wu et al (23) found that a physician and pharmacist collaborative care model to address the shortage of buprenorphine-waivered physicians in the US appeared to be feasible and had high acceptability to patients.
- The evaluation of the Rural Outpatient Opioid Treatment program pilot which was a nurse-led model in Canada demonstrated that an outpatient opioid treatment program (OTP) can be successfully integrated into rural primary care.(1)
- Vermont (US) implemented an innovative “hub-and-spoke” system to expand access to treatment. Each region has a “hub” which is a licensed specialty OTP and the “spokes” are medical practices that provide office-based opioid treatment. Rawson et al found treatment

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as delivered in the hub-and-spoke system is highly effective for reducing opioid use and overdose and improving functioning in many life domains.(4)

- Washington State (US) implemented their own novel hub-and-spoke model which built on prior approaches and improved access by increasing integration of care and providing access to treatment in a variety of service settings (e.g., mental health agencies, primary care) rather than requiring direct contact with an OTP.(19) With this approach, nearly 5,000 people were inducted into treatment in 18 months.
- The health home model was successfully implemented in three states in the US (Maryland, Rhode Island and Vermont) and showed potential to effectively address the complex needs of individuals with opioid use disorder by providing whole-person care that integrates medical care, behavioural health, and social services and supports.(17) This model coordinates treatment between OTPs and office-based opioid treatment with other services.

### ***Low threshold***

- OTPs in the US have rigid requirements for entry and continuation of treatment. Low threshold models (n=2) described removed as many barriers to treatment as possible.
- Low threshold models were implemented in Kentucky and Missouri, US. Kentucky's Emergency Department (ED) bridge model allowed ED staff to initiate treatment and included a transitional outpatient clinic for discharged patients. In Missouri's Medication First model patients receive pharmacotherapy as quickly as possible. Supportive state policies, partnerships and collaborations, and sustainability were identified as key success factors.(2)
- Kelly et al also reported on a novel low threshold model where treatment is initiated in the ED which effectively used social work staff to promote patient engagement with outpatient services.(24)

### ***Group-based treatment***

- Group-based treatment models were described in two studies. Lander et al found a novel group-based model of buprenorphine treatment in West Virginia (US) was successful in retaining patients long-term in a rural setting (14). Sokol et al provide a blueprint for group-based treatment by delineating the key components of the model in their paper (20).

### ***Mobile outreach***

- Mobile outreach models were described in two studies. The pilot by Wenzel et al demonstrated that the Youth Opioid Recovery Support (YORS) model (a novel outreach treatment approach) was feasible and efficacious. Home delivery of treatment, family or alternate treatment, and emphasis on promotion of medication adherence were part of the model.(22)
  - Weintraub et al also demonstrated the feasibility of a mobile outreach model with telemedicine services integrated to bring treatment to patients in underserved, difficult to access, rural communities. The telemedicine mobile treatment unit staffed with a nurse, a peer recovery specialist, and a substance use counsellor had similar outcomes (retention and opioid use) to office-based treatment programs.(7)
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## **Other models**

Several other models were described. Moore et al found the Safe Station model, a community-initiated response in New Hampshire (US) offers immediate access to services for individuals with opioid use disorders through fire stations.(3)

D’Onofrio et al. is a study protocol to evaluate the impact of implementation facilitation on the adoption of an ED-initiated buprenorphine model for opioid use disorder.(26)

Knudsen et al examined a model for assessing implementation context and fidelity in the Helping to End Addiction Long-term Communities Study.(39) This study is a multisite, community-level cluster-randomised trial to test a novel community engagement intervention.

The review by Nunes et al examined examples of more liberal models of treatment, including the implementation of buprenorphine in France in the 1990s, primary care–based methadone in Canada, and low-threshold buprenorphine models.(15) Selin et al reviewed treatment and policies in the Nordic countries to cast light on the functioning of the Finnish treatment system. (16)

Watson et al is an introduction to a special issue of the Journal of Substance Abuse Treatment on innovative interventions and approaches to expand medication assisted treatment in the US. It mentioned the hub-and-spoke models, Missouri’s Medication-First approach and the ED bridge program in Kentucky among others.(12)

The editorial by Volkow analyses the factors that triggered the opioid crisis and the interventions which are fundamental for curtailing the crisis. The authors suggested strategies to expand access to medication and improve treatment retention, including a more active involvement of psychiatrists to address psychiatric comorbidities, are fundamental to preventing fatalities and achieving recovery.(10)

## **Grey literature**

### **Primary care**

- Vermont’s hub and spoke model was the most frequently mentioned (n=4). It was described as an innovative model to expand access to treatment in website publications by the Pew Charitable Trusts and the Commonwealth Fund (31, 32), and as an opportunity to integrate care in a policy paper for the Substance Abuse and Mental Health Services Administration (SAMHSA, US) (36) and in a AHRQ technical brief (38).
- The Massachusetts’ Nurse Care Managers model was another innovative model to expand access to treatment mentioned by Pew Charitable Trusts (32) and in a AHRQ technical brief (38).
- Baltimore’s Collaborative Opioid Prescribing (Co-OP) innovative model was mentioned as an example which links primary care with OTPs in the policy paper for SAMHSA (36) and in a AHRQ technical brief (38).
- The Shared Care for Opioid Treatment (SCOT) Project is a model of shared care developed by Metro North Mental Health – Alcohol and Drug Service, Queensland to increase access to treatment. The model increased primary care capacity to manage treatment by providing support and access to alcohol and drug (AOD) services (34). Treatment is commenced in an AOD clinic and transferred to a GP once patient is stable in treatment and considered suitable for shared care. The model enabled AOD services to

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provide timely access to care for complex clients by providing ongoing care in primary care to clients stable in their treatment. An evaluation of the SCOT Project highlighted the viability of a shared care model with the right supports. While costs were not mentioned, a cost differential of between \$500K-\$1.5m in favour of the shared care model was estimated.

### ***Digital health***

- The Project ECHO model, which uses telehealth, was mentioned as an innovative approach a website publications by the Pew Charitable Trust and in a AHRQ technical brief (32, 38).
- The website publication by Health Canada mentioned that funding for treatment in Newfoundland and Labrador in Canada was increased for new models which will pay for case managers, primary care providers, and telemedicine. With new models, patients will have more access to treatment in their own communities (29).
- The environmental scan for the Canadian Agency for Drugs and Technologies in Health identified facilitators to timely access, including walk-in style programs, transportation initiatives, increased staffing, lowered stigma, flexible appointment times and integrated treatment services. Telehealth programs were found to be successful in facilitating access to treatment across Canada, especially in rural and remote regions (37).

### ***Low threshold***

- The publication on the Commonwealth Fund website mentioned an innovative low-threshold approach in an urban setting. Bellevue Hospital (US) provides initial screening and patients receive a one-week prescription for buprenorphine-naloxone (31). Although it is encouraged, patients are not required to receive counselling, nor is treatment automatically suspended if they fail a screening test for illicit substances.

### ***Group-based treatment***

- The Commonwealth Fund website also mentioned the Open Door Clinic's group-based treatment model that made providing treatment services financially and logistically feasible. The model is structured around group visits to enable the clinic to cover the cost of drug counsellors and nurses, whose services aren't billable (31).

### ***Mobile outreach***

- Two website publications by The Kraft Center for Community Health (US) and the Legislative Analysis and Public Policy Association (US) were on the use of mobile outreach vans providing health care and harm reduction services for hard-to-reach communities. Community Care in Reach vans provided only prescriptions only not medication (30). The Legislative Analysis and Public Policy Association fact sheet provided nine examples of mobile outreach vans in use across the US, which provide buprenorphine treatment, naloxone, and referrals for ongoing treatment (28).

### ***Other documents***

- A second website publication by the Pew Charitable Trust made recommendations to improve access to treatment and integrate care (33). Recommendations for policy makers include expanding take-home dosing and treatment in new settings, allowing OTPs more
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flexibility to dispense methadone for use at home (e.g., distributing one month's worth at a time) so patients do not have to return to a clinic every day for treatment.

- The White Paper by Furnival and McGovern provided context on how Australia reached its current OTP paradigms and identified some of the challenges (35). Key challenges included access to prescribers in terms of number and location; access to dispensing sites; travel time and costs; limits to patient numbers; and opening hours. Barriers to treatment included the dispensing fee, the experience of queuing to be dosed and availability and flexibility of dosing. Stigma is also a common part of the patient experience.

**Table 1**—Summary overview of peer reviewed papers

Type of delivery model Author, year, country	Study design	Description of model of care	Effectiveness* (or relevant findings)	Costs
<i>Digital health</i>				
Clark et al, 2021, USA	Commentary	24/7 telephone clinic where patients linked with a buprenorphine prescriber in real-time assessment and unobserved buprenorphine initiation	Not mentioned.	Not mentioned
Langdon et al, 2021, US	Qualitative study	Interactive computer- and text message–delivered personalised feedback intervention for adults initiating outpatient buprenorphine treatment.	Not mentioned. The intervention was highly acceptable. Presentation of material, including the length of the intervention, is effective in facilitating learning.	Not mentioned
Tringale and Subica, 2021, US	Commentary	Telephone booth model that allowed socially distanced on-site “face-to-face” treatment of syringe exchange patients during COVID-19	Not mentioned. Data indicate changes maintained patient enrolment and engagement in treatment	Not mentioned
Tofighi et al, 2019, US	Evaluation	Program offers primary care providers training and support in managing opioid use disorder via videoconference	Not mentioned.	Not mentioned
Velez et al, 2021, US	Observational study	reSET-O is an evidence-based digital neurobehavioral intervention aimed at patients who are already using buprenorphine.	Not mentioned. reSET-O initiation was associated with fewer inpatient, ED, and other clinical encounters, increased case management/rehabilitative services, and lower net costs over six months.	Not mentioned. Cost savings of USD 2,150 per patient were achieved over a period of six months.

Type of delivery model Author, year, country	Study design	Description of model of care	Effectiveness* (or relevant findings)	Costs
Wang et al, 2021, US	Commentary	Telemedicine to initiate buprenorphine treatment	Not mentioned. Anecdotal evidence that during Covid-19 pandemic this model increased access, and lowered barriers initiating treatment	Not mentioned
Weintraub et al, 2018, US	Evaluation	Buprenorphine treatment to patients at a drug treatment centre in rural Maryland via telemedicine	Not mentioned. Retention in treatment was 91% at 1 month, 73% at 2 months, and 57% at 3 months.	Not mentioned
<i>Primary care</i>				
Bach et al, 2019, US	Review	Various pharmacist-led models described with varying approaches including community pharmacists monitoring for problematic opioid use, increasing pharmacy-based harm reduction efforts (including naloxone distribution), and involving community pharmacists in the dispensation of medication.	Not mentioned	Not mentioned
Buck-McFadyen et al, 2021, Canada	Evaluation (pilot)	Nurse system navigator and family physician model expanded to include a multidisciplinary team of community-based service providers to facilitate integration of group recovery work, primary care, harm reduction and peer support, all coordinated within primary care services.	Not mentioned. Opioid use decreased while use of other substances remained high	Not mentioned
Clemens-Cope et al, 2017, US	Qualitative study	Health home model coordinates treatment between OTPs and office-based opioid treatment with medical and behavioural health care and other services	Not mentioned. The model was implemented successfully and was responsible for substantial improvements in patient care.	Not mentioned.

Type of delivery model Author, year, country	Study design	Description of model of care	Effectiveness* (or relevant findings)	Costs
Rawson et al, 2019, US	Evaluation	Vermont's "hub-and-spoke" system – Regional "hubs" with specialist physicians, nurses, and counsellors provide support to local "spokes" (primary care settings).	In-treatment participants showed large reductions in substance use, overdoses, ED visits, police contacts, and family conflict, and improvements in mood and satisfaction with all areas of life, except work/school participation	Not mentioned
Reif et al, 2021, US	Qualitative study	Washington State Hub and Spoke model integrated care and included a "no wrong door" policy. An important innovation was the flexibility to allow primary care providers to serve as hubs.	Not mentioned. Nearly 5,000 people were inducted onto medication in the first 18 months.	Not mentioned
Wu et al, 2021, US	Non-randomised feasibility trial	Physician and pharmacist collaborative care model - eligible patients' buprenorphine care was transferred from their physician to a community pharmacist for 6 months	Not mentioned. Model was feasible and acceptable	Not mentioned

*Low threshold*

High et al, 2020, US	Evaluation	The Emergency Department (ED) bridge model in Kentucky, which links patients discharged from EDs to treatment and recovery services. The Medication First model in Missouri which prioritises rapid and sustained access to lifesaving resources (medications for OUD)	Not mentioned. Prior to intervention 30,000 people received prevention services, during implementation > 118,000 individuals received treatment	Not mentioned
Kelly et al, 2020, US	Observational study	EDs initiate buprenorphine and provide outpatient referrals through a social work driven care model - warm hand-off to community clinics.	Not mentioned. 120 patients opted for ED buprenorphine induction. 39% remained engaged in treatment after 30 days.	Not mentioned

Type of delivery model Author, year, country	Study design	Description of model of care	Effectiveness* (or relevant findings)	Costs
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*Group-based treatment*

Lander et al, 2020, US	Review	30-min group appointment (which includes medication management with a prescriber), directly followed by a 60-minute group-based psychosocial therapy session	Not mentioned. 37.8% retained less than 1-year; 62.7% retained for 1-year or more, 33.9% retained for 3 years or more	Not mentioned
Sokol et al, 2019, US	Qualitative study	A blueprint delineating group-based treatment implementation described	Not mentioned	Not mentioned

*Mobile outreach*

Weintraub et al, 2021, US	Evaluation	Combined use of telemedicine and mobile treatment on demand. Patients received buprenorphine prescriptions after initial teleconsultation and follow-up visits from a study physician specialized in addiction psychiatry and medicine.	58.51% were retained in treatment by 3 months. Evaluation demonstrated feasibility of combining telemedicine with mobile treatment, with outcomes (retention and opioid use) similar to those obtained from office-based telemedicine treatment programs	Not mentioned
Wenzel et al, 2021, US	Clinical trial	Multi-component intervention to improve adherence include home delivery of treatment, family or alternate treatment significant other involvement with an emphasis on promotion of medication adherence, assertive outreach to engage and maintain contact through often chaotic trajectories	Not mentioned. Feasibility and efficacy of intervention demonstrated.	Not mentioned

Type of delivery model Author, year, country	Study design	Description of model of care	Effectiveness* (or relevant findings)	Costs
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*Other models*

D'Onofrio et al, 2019, US	Study protocol	Emergency department-initiated buprenorphine	N/A	N/A
Knudsen et al, 2020, US	Cluster-randomised trial	This study measured implementation context and fidelity for a community engagement intervention.	N/A	N/A
Moore et al, 2021, US	Evaluation	Safe Station is a novel response that offers immediate, access to services through fire stations.	Not mentioned. Data convergence provided guidance to the sustainability and replicability of the program.	Not mentioned
Nunes et al, 2021, US	Review	Primary care-based methadone in Canada, and low-threshold buprenorphine models described	Not mentioned	Not mentioned
Selin et al, 2015, Finland	Review	Treatment and policies in the Nordic countries described. Denmark- methadone administered usually daily. Take-home doses also possible. Norway- patient decides treatment objectives. Usually, doses are taken under supervision every day for 3 months. Then maximum one weeks take home doses are given. Sweden- treatment plan drafted with patient. For two months- medications taken under supervision. Then take-home doses if doctor allows (frequency not mentioned). Does not mention frequency in Iceland and Finland	Not mentioned	Not mentioned



Type of delivery model Author, year, country	Study design	Description of model of care	Effectiveness* (or relevant findings)	Costs
Watson et al, 2020, US	Commentary	Mentioned Hub-and-Spoke models of care, Missouri's Medication-First approach and the ED bridge program in Kentucky	Not mentioned	Not mentioned
Volkow et al, 2019, US	Editorial	Strategies to expand access to medication and improve treatment retention, including a more active involvement of psychiatrists who are optimally trained to address psychiatric comorbidities	Not mentioned	Not mentioned

\*Effectiveness defined as meeting the goals of the client

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# Appendices

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## Appendix 1: Included publications

### *Peer reviewed literature*

Bach P, Hartung D. Leveraging the role of community pharmacists in the prevention, surveillance, and treatment of opioid use disorders. *Addiction Science & Clinical Practice*. 2019;14(1):30.

Buck-McFadyen E, Lee-Popham S, White A. Pilot program integrating outpatient opioid treatment within a rural primary care setting. *Rural and Remote Health*. 2021;21(3):6413.

Clark SA, Davis C, Wightman RS, Wunsch C, Keeler LAJ, Reddy N, et al. Using telehealth to improve buprenorphine access during and after COVID-19: A rapid response initiative in Rhode Island. *Journal of Substance Abuse Treatment*. 2021;124.

Clemans-Cope L, Wishner JB, Allen EH, Lallemand N, Epstein M, Spillman BC. Experiences of three states implementing the Medicaid health home model to address opioid use disorder—Case studies in Maryland, Rhode Island, and Vermont. *Journal of Substance Abuse Treatment*. 2017;83:27-35.

D'Onofrio G, Edelman EJ, Hawk KF, Pantaloni MV, Chawarski MC, Owens PH, et al. Implementation facilitation to promote emergency department-initiated buprenorphine for opioid use disorder: Protocol for a hybrid type III effectiveness-implementation study (Project ED HEALTH). *Implementation Science*. 2019;14(1).

High PM, Marks K, Robbins V, Winograd R, Manocchio T, Clarke T, et al. State targeted response to the opioid crisis grants (opioid STR) program: Preliminary findings from two case studies and the national cross-site evaluation. *Journal of Substance Abuse Treatment*. 2020;108:48-54.

Kelly T, Hoppe JA, Zuckerman M, Khoshnoud A, Sholl B, Heard K. A novel social work approach to emergency department buprenorphine induction and warm hand-off to community providers. *American Journal of Emergency Medicine*. 2020;38(6):1286-90.

Knudsen HK, Drainoni M-L, Gilbert L, Huerta TR, Oser CB, Aldrich AM, et al. Model and approach for assessing implementation context and fidelity in the HEALing Communities Study. *Drug and Alcohol Dependence*. 2020;217.

Knudsen HK, Drainoni M-L, Gilbert L, Huerta TR, Oser CB, Aldrich AM, et al. Corrigendum to “Model and approach for assessing implementation context and fidelity in the HEALing Communities Study” [*Drug Alcohol Depend*. 217 (2020)].

Lander LR, Zheng W, Hustead JD, Mahoney JJ, III, Berry JH, Marshalek P, et al. Long-term treatment retention in West Virginia's comprehensive opioid addiction treatment (COAT) program. *Journal of the Neurological Sciences*. 2020;411.

Langdon KJ, Scherzer C, Ramsey S, Carey K, Rich J, Ranney ML. Feasibility and acceptability of a

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digital health intervention to promote engagement in and adherence to medication for opioid use disorder. *Journal of Substance Abuse Treatment*. 2021.

Moore SK, Saunders EC, McLeman B, Metcalf SA, Walsh O, Bell K, et al. Implementation of a New Hampshire community-initiated response to the opioid crisis: A mixed-methods process evaluation of Safe Station. *International Journal of Drug Policy*. 2021;95.

Nunes EV, Levin FR, Reilly MP, El-Bassel N. Medication treatment for opioid use disorder in the age of COVID-19: Can new regulations modify the opioid cascade? *Journal of Substance Abuse Treatment*. 2021;122:108196.

Rawson R, Cousins SJ, McCann M, Pearce R, Van Donsel A. Assessment of medication for opioid use disorder as delivered within the Vermont hub and spoke system. *Journal of substance abuse treatment*. 2019 Feb 1;97:84-90.

Reif S, Brolin MF, Stewart MT, Fuchs TJ, Speaker E, Mazel SB. The Washington State Hub and Spoke Model to increase access to medication treatment for opioid use disorders. *Journal of Substance Abuse Treatment*. 2020;108:33-9.

Selin J, Perälä R, Stenius K, Partanen A, Rosenqvist P, Alho H. Opioid substitution treatment in Finland and other Nordic countries: Established treatment, varying practices. *Nordic Studies on Alcohol and Drugs*. 2015;32(3):311-24.

Sokol R, Albanese M, Chew A, Early J, Grossman E, Roll D, et al. Building a Group-Based Opioid Treatment (GBOT) blueprint: A qualitative study delineating GBOT implementation. *Addiction Science and Clinical Practice*. 2019;14(1).

Tofighi B, Isaacs N, Byrnes-Enoch H, Lakew R, Lee JD, Berry C, et al. Expanding treatment for opioid use disorder in publicly funded primary care clinics: Exploratory evaluation of the NYC health + hospitals buprenorphine ECHO program. *Journal of Substance Abuse Treatment*. 2019;106:1-3.

Tringale R, Subica AM. COVID-19 innovations in medication for addiction treatment at a Skid Row syringe exchange. *Journal of Substance Abuse Treatment*. 2021;121.

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Wu L-T, John WS, Ghitza UE, Wahle A, Matthews AG, Lewis M, et al. Buprenorphine physician–pharmacist collaboration in the management of patients with opioid use disorder: results from a multisite study of the National Drug Abuse Treatment Clinical Trials Network. *Addiction*. 2021;116(7):1805-16.

### ***Grey literature***

Duncan A (2018) Innovative Approaches Can Help Improve Availability of Opioid Use Disorder Treatment. Pew Charitable Trusts. Issue Brief.

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## Appendix 2: Search strategy

### *Key concepts*

Concept 1	Concept 2	Concept 3	Concept 4
“model of treatment”	opioid	effectiv*	innovat*
program	heroin	efficac*	novel
system	methadone	evaluat*	new
initiative	buprenorphine		
“model of care”	codeine		
delivery	fentanyl		
	oxycodone		
	opium		
	naloxone		

Additional to the above, to reduce the number of false positives in the search results a number of exclusion terms were added: hepatitis, HCV, HIV, AIDs, cancer, leukaemia, palliative, "end of life", neonatal.

### *Timeframe*

This review includes peer reviewed and grey literature published from January 2016 to November 2021.

### *Inclusion and exclusion criteria*

We included studies which described models of opioid treatment which had been implemented and were considered safe. We focussed on those which had the potential to increase access to treatment and which were considered effective (either in terms of meeting patients' own treatment goals, use of illicit opioids, treatment retention, or other stated goals). We included studies which examined 'add-ons' to opioid treatment.

We included all study types, prioritising those with the strongest evidence but including those at a lower level of evidence where the treatment model was promising. We focused mainly on Australia, New Zealand, US, Canada, and the UK, but included papers from some European countries.

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Where mentioned, we reported the frequency of delivery, the personnel leading the programme, the cost to the patient (if any), the costs to the health service, and the goals of the programme.

We excluded studies which were about the efficacy or effectiveness of a treatment, rather than a treatment model or mode of delivery. We excluded studies focussed solely on naloxone/Narcan. We excluded protocol papers and other papers which described models which had not been implemented. We excluded studies which were primarily about pain management, surgery, the effects of the COVID-19 pandemic on drug treatment services, and epidemiological studies.

## Sources

### 1. Scopus

Search:

```
TITLE-ABS-KEY (( treatment OR care OR service OR recovery OR integrated OR intervention OR partnership ) W/3 ( model* OR program* )) OR initiative OR delivery )
AND TITLE-ABS-KEY ( opioid OR heroin OR methadone OR buprenorphine OR codeine OR fentanyl
OR oxycodone OR opium OR naloxone )
AND TITLE-ABS-KEY ( effectiv* OR efficac* OR evaluat* OR ( treatment W/3 ( retain OR retention
OR maintain OR continue ) ) )
AND TITLE-ABS-KEY ( innovat* OR novel OR ( new W/3 ( model OR program OR initiative ) ) )
AND NOT TITLE-ABS-KEY ( hepatitis OR HCV OR HIV OR AIDs OR cancer OR leukaemia OR
palliative OR "end of life" OR neonatal )
```

```
AND ( LIMIT-TO ( PUBYEAR,2021) OR LIMIT-TO ( PUBYEAR,2020) OR LIMIT-TO
( PUBYEAR,2019) OR LIMIT-TO ( PUBYEAR,2018) OR LIMIT-TO ( PUBYEAR,2017) OR LIMIT-TO
( PUBYEAR,2016) )
```

```
AND ( LIMIT-TO ( LANGUAGE,"English" ) )
```

```
AND ( EXCLUDE ( EXACTKEYWORD,"Nonhuman" ) OR EXCLUDE ( EXACTKEYWORD,"Animal" )
OR EXCLUDE ( EXACTKEYWORD,"Animals" ) OR EXCLUDE ( EXACTKEYWORD,"Animal
Experiment" ) OR EXCLUDE ( EXACTKEYWORD,"Animal Model" ) OR EXCLUDE
( EXACTKEYWORD,"Mouse" ) OR EXCLUDE ( EXACTKEYWORD,"Rat" ) )
```

```
AND ( LIMIT-TO ( AFFILCOUNTRY,"United States" ) OR LIMIT-TO ( AFFILCOUNTRY,"Canada" )
OR LIMIT-TO ( AFFILCOUNTRY,"United Kingdom" ) OR LIMIT-TO ( AFFILCOUNTRY,"Australia" )
OR LIMIT-TO ( AFFILCOUNTRY,"Italy" ) OR LIMIT-TO ( AFFILCOUNTRY,"Germany" ) OR LIMIT-TO
( AFFILCOUNTRY,"Netherlands" ) OR LIMIT-TO ( AFFILCOUNTRY,"Spain" ) OR LIMIT-TO
( AFFILCOUNTRY,"Portugal" ) OR LIMIT-TO ( AFFILCOUNTRY,"Switzerland" ) OR LIMIT-TO
( AFFILCOUNTRY,"Belgium" ) OR LIMIT-TO ( AFFILCOUNTRY,"New Zealand" ) OR LIMIT-TO
( AFFILCOUNTRY,"Denmark" ) OR LIMIT-TO ( AFFILCOUNTRY,"France" ) OR LIMIT-TO
( AFFILCOUNTRY,"Ireland" ) OR LIMIT-TO ( AFFILCOUNTRY,"Norway" ) OR LIMIT-TO
( AFFILCOUNTRY,"Sweden" ) OR LIMIT-TO ( AFFILCOUNTRY,"Austria" ) OR LIMIT-TO
( AFFILCOUNTRY,"Czech Republic" ) OR LIMIT-TO ( AFFILCOUNTRY,"Finland" ) )
```

```
AND ( LIMIT-TO ( SUBJAREA,"MEDI" ) OR LIMIT-TO ( SUBJAREA,"PHAR" ) OR LIMIT-TO
( SUBJAREA,"NURS" ) OR LIMIT-TO ( SUBJAREA,"PSYC" ) OR LIMIT-TO ( SUBJAREA,"HEAL" )
OR LIMIT-TO ( SUBJAREA,"SOCI" ) )
```

```
PUBYEAR > 2015
```

- Limited to articles published from 1<sup>st</sup> January 2016 to 9<sup>th</sup> November 2021.
  - Limited to articles published in English.
  - Limited to studies based in Australia, NZ, North America and Europe.
  - Limited to studies with human subjects.
-

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## 2. PubMed

Search:

(((((model\*[Title/Abstract] OR program\*[Title/Abstract] OR initiative[Title/Abstract] OR delivery[Title/Abstract]) AND (opioid[Title/Abstract] OR heroin[Title/Abstract] OR methadone[Title/Abstract] OR buprenorphine[Title/Abstract] OR codeine[Title/Abstract] OR fentanyl[Title/Abstract] OR oxycodone[Title/Abstract] OR opium[Title/Abstract] OR naloxone[Title/Abstract])) AND (effectiv\*[Title/Abstract] OR efficac\*[Title/Abstract] OR evaluat\*[Title/Abstract] OR ( treatment n3 ( retain[Title/Abstract] OR retention[Title/Abstract] OR maintain[Title/Abstract] OR continue ) ) [Title/Abstract])) AND (innovat\*[Title/Abstract] OR novel[Title/Abstract] OR ( new n3 ( model[Title/Abstract] OR program[Title/Abstract] OR initiative ) ) [Title/Abstract])) NOT (hepatitis[Title/Abstract] OR HCV[Title/Abstract] OR HIV[Title/Abstract] OR AIDs[Title/Abstract] OR cancer[Title/Abstract] OR leukaemia[Title/Abstract] OR palliative[Title/Abstract] OR "end of life"[Title/Abstract] OR neonatal[Title/Abstract])) AND (english[Language])

Limited to 2016-2021

Limited to Humans

Limited to article types: Clinical Study, Clinical Trials (all phases and protocols), Comparative Study, Controlled Clinical Trial, Evaluation Study, Government Publication, Journal Article, Multicenter Study, Observational Study, Pragmatic Clinical Trial, Validation Study

- Limited to articles published from 1<sup>st</sup> January 2016 to 9<sup>th</sup> November 2021.
- Limited to articles published in English.
- Limited to research studies.
- Limited to studies with human subjects.
- Excluded editorials, news, correspondence, and letters.

## 3. CINAHL

Search:

(+model\*+OR+program\*+OR+initiative+OR+delivery+)+AND+(+opioid+OR+heroin+OR+methadone+OR+buprenorphine+OR+codeine+OR+fentanyl+OR+oxycodone+OR+opium+OR+naloxone+)+AND+(+effectiv\*+OR+efficac\*+OR+evaluat\*+OR+(+treatment+n3+(+retain+OR+retention+OR+maintain+OR+continue+)+)+)+AND+(+innovat\*+OR+novel+OR+(+new+n5+(+model+OR+program+OR+initiative+)+)+)+NOT+(+hepatitis+OR+HCV+OR+HIV+OR+AIDs+OR+cancer+OR+leukaemia+OR+palliative+OR+"end of life"+OR+neonatal+)&cli0=DT1&clv0=201601-202112&cli1=LA1&clv1=Y&cli2=CT2&clv2=Y&cli3=SN3&clv3=Australia+%26+New+Zealand~Canada~Continental+Europe~Europe~UK+%26+Ireland~USA&cli4=AG3&clv4=Adolescent:+13-18+years~All+Adult&type=1&searchMode=Standard&site=ehost-live&scope=site&ssl=y

(+treatment+++n3+++model\*+++OR+++program\*+)+)+OR+++initiative+++OR+++care+++n3+++model\*+)+)+AND+(+opioid+++OR+++heroin+++OR+++methadone+++OR+++buprenorphine+++OR+++codeine+++OR+++fentanyl+++OR+++oxycodone+++OR+++opium+++OR+++naloxone+)+)+AND+(+effectiv\*+++OR+++efficac\*+++O

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R++evaluat\*++OR++(+treatment++W%2f3++(+retain++OR++retention++OR++maintain++OR++continue+)+AND+(+innovat\*++OR++novel++OR++(+new++W%2f3++(+model++OR++program++OR++initiative+)+)+)+NOT+(+hepatitis+OR+HCV+OR+HIV+OR+AIDs+OR+cancer+OR+leukaemia+OR+palliative+OR+%E2%80%9Cend+of+life%E2%80%9D+OR+neonatal+)&cli0=DT1&clv0=201601-202112&type=1&searchMode=Standard&site=ehost-live&scope=site&ssl=y

- Limited to articles published from [date] to 29 [date].
- Limited to 2016-2021
- Limited to English language
- Limited to Human
- Limited to geographic subsets: Aust/NZ, Canada, Europe, UK & Ireland, USA
- Limited to age groups: all adult and adolescent 13-18

#### 4. Google

- Search terms: “innovative model opioid treatment” and “increase access to opioid treatment”.
- These were narrowed by country: Australia, UK, US, Canada.

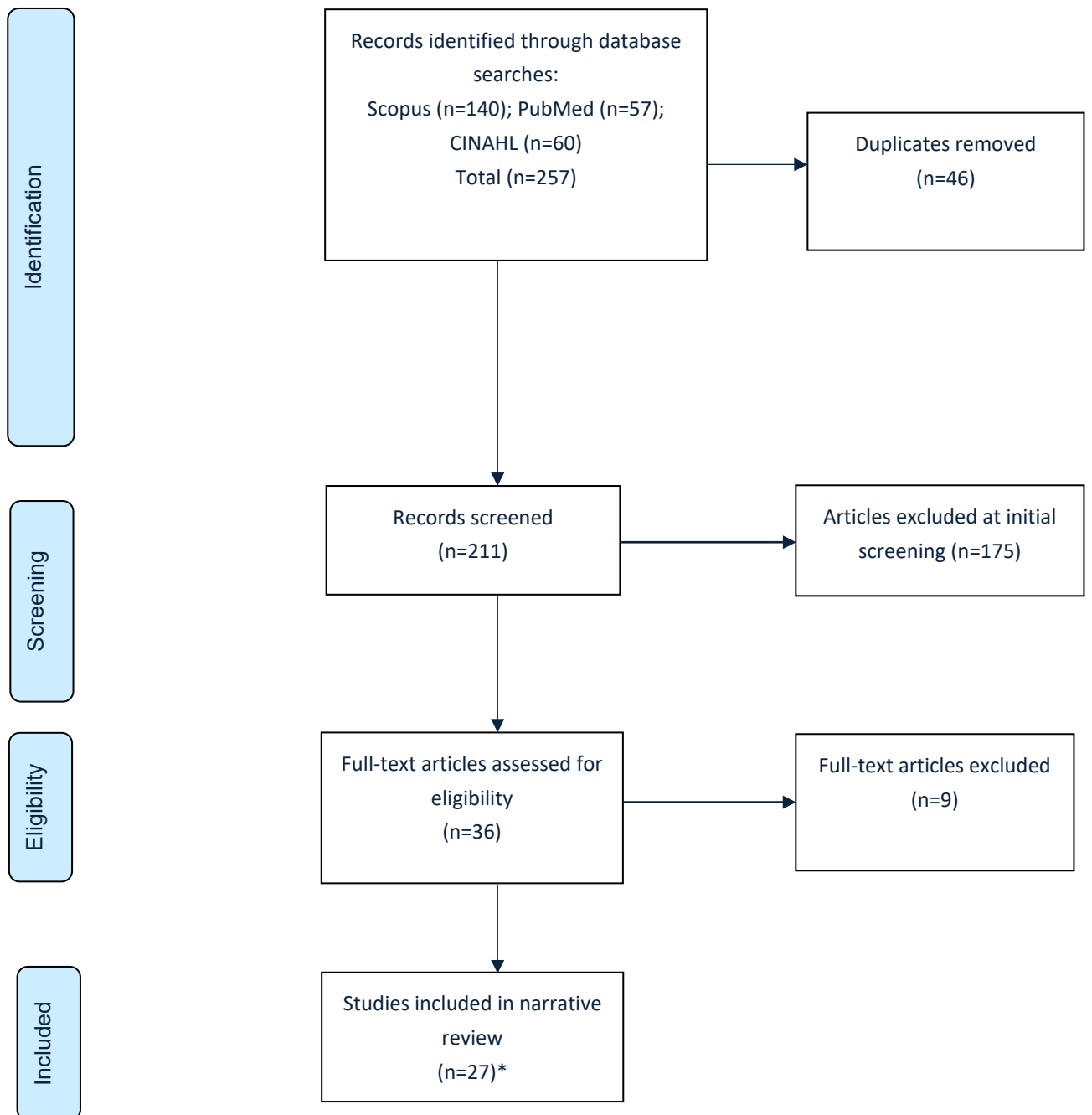
#### 5. Jurisdictional searches

Organisations searched: UK Department of Health and Social Care, NZ Ministry of Health, US CDC, German Federal Ministry of Health, Swedish Ministry of Health and Social Affairs, the King’s Fund, and the Oxford Centre for Evidence Based-Medicine

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### Appendix 3: PRISMA Diagram



\* One of the articles was a corrigendum: Knudsen et al, 2021.

## Appendix 4: Data extraction tables

**Table 4.1 Peer reviewed literature**

Author, Year Country	Study design	Setting	Short description	Results/Outcomes
Bach et al, 2019, US	Review	Pharmacy	Narrative review of models leveraging the role of pharmacists implemented in different countries.	Specific approaches examined include strategies to facilitate pharmacist monitoring for problematic opioid use, to increase pharmacy-based harm reduction efforts (including naloxone distribution and needle exchange programs), and to involve community pharmacists in the dispensation of opioid agonist therapy. Each of these activities present a potential means to further engage pharmacists in the identification and treatment of opioid use disorders.
Buck-McFadyen et al, 2021, Canada	Evaluation	Primary care	Evaluation of a pilot program - Rural Outpatient Opioid Treatment (ROOT) program which was developed to bring some of the structure of an inpatient treatment program into a rural outpatient setting.	Findings from the urine drug screen showed that opioid use declined throughout the first 12 weeks of follow-up. Other unprescribed substances, particularly methamphetamines and cocaine, remained high throughout the program (33-64%).
Clark et al, 2021, US	Commentary	Outpatient	24/7 telephone hotline to function as a “tele-bridge” clinic where people with opioid use disorder can be linked with a buprenorphine prescriber in real-time for assessment and	50% reduction in no-show rate of new patients following telehealth consultation. From mid-April 2020 to mid-November 2020, 74 fielded 93 calls and new buprenorphine prescriptions.

Author, Year Country	Study design	Setting	Short description	Results/Outcomes
			unobserved buprenorphine initiation with connection to follow-up if appropriate.	
Clemens-Cope et al, 2017, US	Qualitative study	Primary care	Case studies in Maryland, Rhode Island, and Vermont of experiences of implementing the Medicaid health home model to address opioid use disorder. The model coordinates treatment provided at opioid treatment programs and office-based treatment with medical and behavioural health care and other services.	Discussants reported that the model was implemented successfully and was responsible for substantial improvements in patient care.
D'Onofrio et al, 2019, US	Study protocol	Hospital	Implementation facilitation to promote emergency department-initiated buprenorphine for opioid use disorder.	N/A
High et al, 2020, US	Evaluation	Mixed	Evaluation of approaches that Kentucky and Missouri implemented in their states using State Targeted Response to the Opioid Crisis Grant. Kentucky implemented the Emergency Department (ED) bridge model, which links patients discharged from EDs to appropriate professional treatment and recovery services.	Findings from the case studies and supported by the national evaluation indicate that key factors to successful program implementation – supportive state policies, partnerships and collaborations, and sustainability – facilitated the implementation of planned interventions.

Author, Year Country	Study design	Setting	Short description	Results/Outcomes
			Missouri implemented the Medication First Model.	
Kelly et al, 2020, US	Observational study	Hospital	A novel social work approach to emergency department buprenorphine induction and warm hand-off to community providers.	120 patients opted for ED buprenorphine induction. 70 (61%) presented to initial outpatient intake appointment and 45 (39%) remained engaged in treatment after 30 days.
Knudsen et al, 2020, US	Randomised cluster trial	Community	This study was about developing an implementation framework, to assess implementation context and fidelity.	No results presented in the study.
Lander et al, 2020, US	Review	Primary care	Long-term treatment retention in West Virginia's comprehensive opioid addiction treatment (COAT) program.	37.8% of patients were retained less than one year and 14.7% were retained 10 or more years. Initiating treatment at a younger age was associated with long-term retention.
Langdon et al, 2021, US	Qualitative study	Mixed	Feasibility and acceptability of a and structure of an interactive computer- and text message-delivered personalised feedback intervention to promote engagement in and adherence to medication for opioid use disorder for adults initiating outpatient buprenorphine treatment.	The intervention was highly acceptable. Presentation of material, including the length of the intervention, is effective in facilitating learning.

Author, Year Country	Study design	Setting	Short description	Results/Outcomes
Moore et al, 2021, US	Evaluation	Community	The Safe Station model offers immediate access to services for persons with opioid use disorders through fire stations.	Community partners identified key program characteristics including firefighter compassion, low- threshold access, and immediacy of service linkage. Implementation and sustainability survey data corroborate the qualitative interview and observation data in these areas.
Nunes et al, 2021, US	Review	Mixed	Reviewed examples of more liberal treatment for opioid use disorder regimens than the US, including the implementation of buprenorphine in France in the 1990s, primary care–based methadone in Canada, and low-threshold buprenorphine models.	There was evidence of reductions in mortality overall associated with the availability of low-threshold methadone.
Rawson et al, 2019, US	Evaluation	Primary care	Evaluation of Vermont innovative system called the “hub-and-spoke” (H & S) system, with 7 regional “hubs” that offer methadone and buprenorphine, as well as intensive support, and 77 local “spokes” (primary care settings) that offer buprenorphine.	85% of participants reported 90-day abstinence from opioid use compared to 0% of out-of-treatment participants. In-treatment participants reported statistically significant changes in areas of function related to health (decrease in ED visits, overdoses), school participation (increase in days attending school), criminal involvement (decreased interaction with police and involvement in illegal activities), family and mood (all measures decreased), compared to no changes in the out-of-treatment participants.
Reif et al, 2021, US	Qualitative	Primary care	Examines the design, early implementation and results Washington State Hub and Spoke	About 150 prescribers are in these networks (25 on average). In the first 18 months, nearly 5,000 people were inducted onto OUD

Author, Year Country	Study design	Setting	Short description	Results/Outcomes
	study		Model which has a flexible approach that incorporates primary care and substance use treatment programs, as well as outreach, referral and social service organisations, and a nurse care manager.	medication treatment: 73% on buprenorphine, 19% on methadone, and 9% on naltrexone.
Selin et al, 2015, Finland	Review	N/A	Discussed the history of substitution treatment and drug abuse treatment policies in the Nordic countries. Then the coverage and extent of treatment and different patient groups in these countries. The objectives and quality of treatment in each country, focusing on national guidelines on treatment practices is described. The treatment systems from the point of view of discontinuation rates and mortality rates during treatment.	Not reported.
Sokol et al, 2019, US	Qualitative study	Primary care	This study delineated the key components of implementing Group-Based Opioid Treatment (GBOT).	Six core components to GBOT implementation were identified that optimise clinical outcomes, comply with mandatory policies and regulations, ensure patient and staff safety, and promote sustainability in delivery. These were consistent group expectations, team-based approach to care, safe and confidential space, billing compliance, regular monitoring, and regular patient participation.

Author, Year Country	Study design	Setting	Short description	Results/Outcomes
Tofighi et al, 2019, US	Evaluation	Primary care	The study assessed the feasibility of a 16-session video conferencing platform led by Addiction Medicine experts in improving addiction knowledge, perceived self-efficacy, and buprenorphine prescribing among primary care providers.	Perceived self-efficacy improved post-H+H ECHO (73.2%) versus pre-training survey results (58.1%). There were minimal increases in knowledge post-training (58.4%) versus pre-training (51.4%). Only three additional providers reported prescribing Buprenorphine post-training (n=10) versus pre-training (n=7).
Tringale and Subica, 2021, US	Commentary	Outpatient	Described a novel “telephone booth” model that allowed socially distanced on-site “face-to face” treatment of syringe exchange patients.	Telebooth was useful to maintain social distancing. Data indicate that this model effectively supported treatment delivery during COVID-19. In February 2020, 86% received buprenorphine through direct dispensing. By April and May, 89% of patients received buprenorphine through coordinated pharmacies—confirming the feasibility and acceptability of using a socially distanced “coordinated pharmacy” model to engage and retain patients in treatment.
Velez et al, 2021, US	Observational study	Mixed	Retrospective claims study evaluated healthcare resource utilisation up to 6 months before/after reSET-O initiation.	Facility encounters decreased, with 45 fewer inpatient (P = 0.024) and 27 fewer emergency department visits (P = 0.247). Clinical encounters with largest changes were drug testing (638 fewer; P < 0.001), psychiatry (349 fewer; P = 0.036), case management (176 additional = 0.588), other pathology/laboratory (166 fewer; P = 0.039), office/other outpatient (154 fewer; P = 0.302), behavioural rehabilitation (111 additional; P = 0.124), alcohol/substance rehabilitation (96 fewer; P = 0.348), other rehabilitation (66 fewer; P

Author, Year Country	Study design	Setting	Short description	Results/Outcomes
				= 0.387), mental health rehabilitation (61 additional; P = 0.097), and surgery (60 fewer; P = 0.070). Changes in facility/clinical encounters saved \$2,150/patient.
Volkow et al, 2019, US	Editorial	N/A	This review analysed the factors that triggered the opioid crisis and its further evolution, along with the interventions to manage and prevent opioid use disorder, which are fundamental for curtailing the opioid crisis.	Strategies to expand access to medication for OUD and improve treatment retention, including a more active involvement of psychiatrists who are optimally trained to address psychiatric comorbidities, are fundamental to preventing fatalities and achieving recovery.
Wang et al, 2021, US	Commentary	Primary care	Two harm reduction primary care programs in New York State that care for people who use drugs and offer buprenorphine, one rural (Ithaca) and one urban (Manhattan), rapidly adopted telemedicine to initiate buprenorphine treatment.	Experience suggests that telemedicine for buprenorphine initiation is eliminating many traditional barriers to treatment.
Watson et al, 2020, US	Commentary	Mixed	Introduction to the special issue on innovative interventions and approaches to expand treatment. Mentioned Hub-and-Spoke models of care, Missouri's Medication-	Not reported.



Author, Year Country	Study design	Setting	Short description	Results/Outcomes
			First approach and the ED bridge program in Kentucky.	
Weintraub et al, 2018, US	Evaluation	Primary care	This report describes the results of a retrospective chart review of 177 patients in a rural drug treatment centre that were treated with buprenorphine through telemedicine.	Retention in treatment was 98% at 1 week, 91% at 1 month, 73% at 2 months, and 57% at 3 months. Of patients still engaged in treatment at 3 months, 86% had opioid-negative urine toxicology.
Weintraub et al, 2021, US	Evaluation	Primary care	Evaluation of the use of a telemedicine mobile treatment unit to improve access to treatment for individuals living in an underserved rural area.	Fifty-five patients (58.51%) were retained in treatment by 3 months (90 days) after baseline. Opioid use was reduced by 32.84% at 3 months, compared with baseline, and was negatively associated with treatment duration (F = 12.69; P = .001).
Wenzel et al, 2021, US	Clinical trial	At home	This pilot study tested the Youth Opioid Recovery Support (YORS) intervention among a group choosing either XR-MOUD compared to historical treatment as usual (H-TAU) and intervention conditions from a previous study.	Participants in YORS compared to H-TAU received more outpatient doses at 12 weeks (1.91 vs. 0.40, p < .001) and 24 weeks (3.76 vs. 0.70, p < .001), had lower relapse rates at 12 weeks (36.4% vs. 75.0%; p = .012) and 24 weeks (52.9% vs. 95.0%; p = .003), and had greater cumulative relapse-free survival over 24 weeks (HR = 2.65, 95% CI: 1.17–6.02, p < .05).

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Author, Year Country	Study design	Setting	Short description	Results/Outcomes
Wu et al, 2021, US	Feasibility trial	Primary care	This study investigated the feasibility and acceptability of a new collaborative care model involving buprenorphine-waivered physicians and community pharmacists. Eligible patients' buprenorphine care was transferred from their physician to a community pharmacist for 6 months.	There were high rates of treatment retention (88.7%) and adherence (95.3%) at the end of the study. Participant satisfaction: over 90% expressed high satisfaction.

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**Table 4.2 Grey literature summaries**

**Duncan A (2018) Innovative Approaches Can Help Improve Availability of Opioid Use Disorder Treatment. Pew Charitable Trusts. Issue Brief.** Available from: <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/11/innovative-approaches-can-help-improve-availability-of-opioid-use--disorder-treatment>

This brief described four innovative treatment models that show promise in improving patient outcomes. All of them offer medication-assisted treatment (MAT) which combines medication with behavioural interventions and focus on care coordination for individuals with opioid use disorder (OUD).

In 2013, Vermont implemented a *hub and spoke model* which expands access to treatment and counselling services. Specialists initiate treatment (hub), and care is then transferred to a community-based provider (spoke), once the patient is stabilised. Three years after hub-and-spoke was implemented, the number of physicians able to prescribe buprenorphine for OUD had increased by 64%.

Massachusetts used a *nurse care managers (NCMs) model* to expand access to treatment. NCMs conduct an initial screening; the physician confirms diagnosis and the appropriateness of treatment; and the NCM delivers MAT in community-based centres. Access to OUD treatment substantially increased from 327 patients in 2007 to 3,000 patients in 2014.

Project ECHO (Extension for Community Healthcare Outcomes) model, developed by the University of New Mexico, uses telehealth technology to connect providers, particularly those in rural and underserved areas, with specialists. This model increased buprenorphine prescribers from 36 in 2006 to 375 in 2016.

The *telemedicine model* allows medication prescription and behavioural health therapy via a secure, cloud-based electronic interface. The psychiatrist prescribes medications via videoconference, which can be filled by a pharmacist or administered by a nurse, who also ensures care coordination. Retention rates (63%) were comparable among those receiving in-person care (50-72%).

Costs - not mentioned

Innovation - Use of telehealth and telemedicine

**Stoller K, Stephens M, Schoorr A (2016) Integrated Service Delivery Models for Opioid Treatment Programs in an Era of Increasing Opioid Addiction, Health Reform, and Parity.**

American Association for the Treatment of Opioid Dependence policy paper for the Substance Abuse and Mental Health Services Administration in the U.S. Department of Health and Human Services.

This paper aims to provide a blueprint for more innovative and integrated service delivery, focusing on 8 (OTPs) as comprehensive treatment hubs in the treatment of opioid addiction.

It presented 11 opportunities for integrating care in OTPs including coordinating with:

- Physicians Prescribing Buprenorphine (Vermont's hub and spoke model and Baltimore's Collaborative Opioid Prescribing (Co-OP) model were described)
- Primary Care Practices
- Psychiatric Providers

- 
- Specialty Medical Providers - Pain Treatment Providers, Obstetric Providers, Infectious Disease Treatment Providers
  - Hospital-based Opioid Treatment Programs.

The second half of the paper covered OTPs and New York's Medicaid redesign. New York State is transforming its health care delivery system with the largest Medicaid program in the country. The paper provided options to support an innovative care model with care coordination - a behavioural health care site with fully integrated, co-located primary health care.

Costs - not mentioned

Innovation – a behavioural health care site with fully integrated, co-located primary health care

**No Author (2021) Opioid Treatment Programs: A Key Treatment System Component. Pew Charitable Trusts. Issue Brief.** Available from: <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2021/07/opioid-treatment-programs-a-key-treatment-system-component>

This brief provided recommendations to ensure that comprehensive opioid use disorder (OUD) care at opioid treatment programs (OTPs) reaches populations in need and is integrated into systems delivering other health care services. To improve access, state and federal policymakers can take the following steps:

- Eliminate burdensome restrictions on the establishment of new OTPs - State lawmakers can reduce zoning restrictions and other legal hurdles that prevent the creation of new OTPs.
- Improve OTP integration into broader initiatives to reform health care delivery - State health agencies should incorporate OTPs into new health delivery system reforms that serve Medicaid enrollees with complex needs, including OUD. Facilitate the adoption of new OTP models that bring medications to underserved populations and reduce barriers for initiating methadone.
- State health agencies should help establish medication units, which are offsite facilities affiliated with an OTP that can dispense medications, and extend OTP services in homeless shelters, prisons, rural communities, and other harder-to-reach settings.
- Federal and state policymakers should enable patients to receive medication while they await placement in an OTP.
- Improve OTP access for patients with Medicaid or Medicare.
- Expand take-home dosing and treatment in new settings.
- Federal and state policymakers should allow OTPs more flexibility to dispense methadone for use at home (e.g., distributing one month's worth at a time) so patients do not have to return to a clinic every day to receive their treatment.
- Federal policymakers should allow methadone to be distributed in pharmacies, primary care offices, and other community care settings.

Costs - not mentioned

Innovation – not mentioned

**Furnival A and McGovern C (2018) Medication-Assisted Treatment of Opioid Dependence A White Paper.** Available from:

<https://static1.squarespace.com/static/57bfc0498419c24a01318ae2/t/5f5be29d2cb3e0f5771185bfb/1606298089859/MATOD+-+White+Paper+-+FINAL+-+16.5.18.pdf>

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This paper provided context on how Australia reached its current opioid dependence treatment paradigms; information on the emerging trends and products; and identified some of the challenges and opportunities that exist going forward to enhance the treatment framework.

The History of Medication-Assisted Treatment for Opioid Dependence (MATOD) in Australia is covered and noted the National Drug Strategy 2017-26 and National Guidelines for Medication-Assisted Treatment of Opioid Dependence. Medications available for use as well emerging long-acting injection (LAI) medications were described.

The treatment framework for MATOD in Australia was discussed including existing challenges and challenges. These range from the capacity for patients to effectively access treatment through to cost considerations and the patient experience. Key challenges included access to prescribers in terms of number and location; access to dispensing sites; travel time and costs; limits to patient numbers; and opening hours. Barriers to treatment include dispensing fee, the experience of queuing to be dosed and availability and flexibility of dosing. Stigma is also a common part of the patient experience. This is experienced directly and indirectly and even from healthcare professionals in treatment settings.

Case studies are detailed for Ontario, France and the United States as opportunities to reflect on different national approaches and frameworks for MATOD. A number of issues are recommended for further consideration including a national definition for opioid dependency and national consistency of guidelines for treatment. A proposed timetable for addressing key issues such as coming advent of the LAIs was discussed.

Costs - not mentioned

Innovation – not mentioned

**SCOT Project: establishing a sustainable model of shared care for opioid treatment. Metro North Health. Queensland.** Available from: <https://insight.qld.edu.au/training/scot-project-establishing-a-sustainable-model-of-shared-care-for-opioid-treatment/detail>

Shared Care for Opioid Treatment (SCOT) Project has developed a model of shared care for opioid dependence treatment for Metro North Mental Health – Alcohol and Drug Service (MNMH-ADS). The model aims to increase primary care capacity to manage the treatment of opioid dependence by providing access to alcohol and drug (AOD) services and support. The model seeks to enable AOD services to provide timely access to tertiary care for complex and high-risk clients by providing clients stable in their treatment ongoing care in primary care.

A modified Delphi method was used to develop the model. Treatment is commenced in an AOD clinic and transferred to a GP once patient is stable in treatment and considered suitable for shared care. GP has access to a case manager, AOD medical specialists, clinical support line and patient support phone line and workplace training. Processes and resources have been developed to support GPs and a video has been developed to address concerns and answer questions. This is available as part of a package for those interested in implementing a shared care model in their area.

The evaluation of SCOT project was found and is available from: [https://www.health.qld.gov.au/data/assets/pdf\\_file/0018/1126224/shared-care-opioid-treatment-report.pdf](https://www.health.qld.gov.au/data/assets/pdf_file/0018/1126224/shared-care-opioid-treatment-report.pdf)

Cost effectiveness of a Nurse Navigator coordinating and managing shared care treatment was compared to a 'business as usual' model where clinical services expand to meet demand, providing

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treatment to the new, and more complex and high-risk patients in addition to maintaining patients stable in their treatment. Acknowledging this is a simple evaluation of costs associated with both models in meeting increased service demands, it highlights that moving patients into the right care, in the right place, at the right time can increase service capacity at a fraction of the cost of meeting demands by bolstering 'business as usual'. The comparison indicates a cost differential of between \$500k and \$1.5m in favour of a Nurse Navigator model.

The SCOT Project has highlighted the viability of a shared care model with the right supports. The cost effectiveness of a Nurse Navigator model provides an opportunity to meet increasing demands on services through innovation and collaboration with primary health care. A shared care model can meet the Quadruple Aim, improving the patient and staff experience and health outcomes, while providing cost efficiencies. The evaluation recommended that MNMH-ADS investigate possible channels to incorporate a Nurse Navigator model into the treatment framework.

Costs - Not mentioned. Cost differential noted \$500K-\$1.5m in favour of shared care model.

Innovation – Shared care with nurse navigator.

### **New Model for Opioid Dependence Treatment in Newfoundland and Labrador. Health Canada**

Available from: <https://www.cbc.ca/news/canada/newfoundland-labrador/opioid-addiction-funding-1.4727944>

Increased funding of more than \$4 million (\$2.7 million provincial and \$1.6 million federal funding) will be used to pay for case managers, primary care providers, and telemedicine, with a focus on opioid addiction treatment. Using a new model, patients will have more access to treatment in their own communities. Four regional health teams will be located around the province, with access to treatments like Suboxone, a combination of buprenorphine and naloxone lauded across the country as the newest and best way to treat opioid addiction. Video links and telehealth will provide access to people in communities where doctors don't have an office.

Costs - not mentioned

Innovation - Use of telemedicine

### **Wells C, Dolcine B, Frey N (2019). Programs for the Treatment of Opioid Addiction: An Environmental Scan. Ottawa: The Canadian Agency for Drugs and Technologies in Health.**

A literature search and a survey were conducted for this environmental scan to describe the opioid treatment programs that are currently available in Canada and internationally, identify the recommended wait times, identify prioritisation criteria for entry to programs. The review found that there are numerous types of opioid programs both in Canada and internationally, including residential treatment, community treatment, primary care, pharmacy treatment, therapeutic communities, and programs within correctional settings. According to survey results, wait times in Canada vary from immediate service to about three months. Facilitators to timely access include walk-in style programs, transportation initiatives, increased staffing, lowered stigma, flexible appointment times, and integrated treatment services. Telehealth programs were also successful in facilitating access to opioid programming across Canada, especially in rural and remote regions. Common prioritisation criteria for services include patients who are at high risk, such as pregnant patients, adolescents, and individuals with HIV. Communication and integration of services was noted as key to improving transitions between settings, including from the emergency department (ED) to primary care, primary

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care to specialised clinics, and from correctional settings to the community. This scan does not include an assessment of the clinical or cost-effectiveness of opioid addiction treatment programs.

Costs - not mentioned

Innovation - Use of telehealth

**Community Care in Reach® The Kraft Center.** Available from:

<https://www.kraftcommunityhealth.org/CommunityCareInReach>. Evaluation of pilot available from <https://www.kraftcommunityhealth.org/wp-content/uploads/2020/04/CareZONE-evaluation-report-01-31-2019-Final-suppressed.pdf>

Community Care in Reach® is an innovative mobile health initiative that brings together partners in preventive care, addiction services, and harm reduction to serve individuals not well-connected to health care, experiencing homelessness and/or living with addiction. The model consists of two components: harm reduction and clinical care, both of which are provided via street outreach and inside a van. A partnership model, Community Care in Reach provides accessible, on-demand care in a partnership model between harm reduction service staff who focus on safer drug use and primary care physicians who prescribe buprenorphine for patients with opioid use disorder.

Costs - not mentioned

Innovation – Use of van for outreach- prescription only provided to patients not medication.

**Mobile Outreach Vans. Legislative Analysis and Public Policy Association.** Available from:

<http://legislativeanalysis.org/wp-content/uploads/2020/07/Mobile-Vans-Fact-Sheet-FINAL.pdf>

Mobile outreach vehicles (MOVs), which are large, customised vans are a popular method to deliver health care and harm reduction services for hard-to-reach communities. MOVs provide a variety of services including referrals to treatment, naloxone distribution, needle exchange services, some provide health services in addition to harm reduction services. Nine examples of MOVs used throughout the United States are presented.

1. Project RIDE (Rapid Initiation of Drug Treatment Engagement) in South Philadelphia initiates and provides free buprenorphine treatment for up to 30 days or until the patient enters a treatment program. A nurse practitioner, a case manager, and a peer recovery specialist work in the van.
2. COTI Project (Centers of Treatment Innovation) in New York State provides treatment, mobile telehealth services, naloxone, harm reduction education, and peer outreach and engagement.
3. PCARE Van (Project Connections at re-Entry) in Baltimore provides buprenorphine treatment, naloxone, and referrals to treatment.
4. Caroline County Mobile Health Unit in Maryland is staffed by a nurse and a peer recovery specialist. A psychiatrist provides telehealth consultation and prescriptions.
5. Wellness Winnie Denver is staffed with mental health counsellors and peer navigators providing peer support; sharps disposal; behavioural health screenings and assessments; naloxone dissemination; referrals to medical, legal, and social services; and toiletry and clothing distribution.
6. Liberations Mobile Wellness van in Connecticut provides recovery support services. A health care professional with prescribing privileges and a recovery coach provides referrals for treatment, prescriptions for buprenorphine, naloxone, needle exchange services, and educational resources.



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7. Mobile health units in Colorado staff by a nurse, AOD counsellor and a peer recovery coach provide naloxone and referrals to treatment services. A doctor who can prescribe buprenorphine is available via telemedicine.
  8. The Stigma Crusher in Chicago provides counselling, referrals and peer support. The van also provides naloxone, fentanyl test strips, safe consumption supplies, safe sex supplies, pill and needle disposal, and toiletries, food, and clothing.
  9. Teen Van San Francisco provides care to high-risk young people aged 10 to 25 at schools and shelters and is staffed by an adolescent physician, a nurse practitioner, a social worker, and a dietitian. Patients can receive AOD counselling and treatment referrals among other services.

Costs - not mentioned

Innovation – Use of van for outreach

**Chou R, Korthuis PT, Weimer M, et al. (2016) Medication-Assisted Treatment Models of Care for Opioid Use Disorder in Primary Care Settings. Technical Brief No. 28.** (Prepared by the Pacific Northwest Evidence-based Practice Center) AHRQ Publication. Agency for Healthcare Research and Quality.

This Technical Brief described promising and innovative MAT models of care in primary care settings and barriers to implementation, and summarised the evidence available on these models, identified gaps in the evidence base to guide future research. A literature review and key informant interviews were conducted.

Twelve representative MAT models of care in primary care settings are described, using a framework with the following components – pharmacological therapy, psychosocial services, care integration/coordination and educational/outreach. The twelve models were:

- Vermont's Hub and Spoke
- Baltimore's Collaborative Opioid Prescribing (Co-OP)
- Massachusetts Nurse Care Manager
- Office-Based Opioid Treatment (OBOT)
- Buprenorphine HIV Evaluation and Support (BHIVES) Collaborative
- Project (ECHO) Extension for Community Healthcare Outcome (New Mexico)
- Medicaid Health Home
- Southern Oregon
- Emergency Department Initiation of Office-Based Opioid Treatment
- Inpatient Initiation of Medication-Assisted Treatment
- Integrated Prenatal Care and Medication-Assisted Treatment

Innovations in MAT models of care include the use of designated nonphysician staff to perform the key integration/coordination role; tiered care models with centralised intake and stabilisation of patients with ongoing management in community settings; screening and induction performed in emergency department, inpatient, or prenatal settings with subsequent referral to community settings; community-based stakeholder engagement to develop practice standards and improve quality of care; and use of Internet-based learning networks. Most trials of MAT in primary care settings focus on comparisons of one pharmacological therapy versus another, or on the effectiveness of different psychosocial interventions, rather than on effectiveness of different MAT models of care per se. Key barriers to implementation include stigma, lack of institutional support, lack of prescribing physicians, lack of expertise, and inadequate reimbursement. Reviewers noted that research is needed to clarify



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optimal MAT models of care and to identify effective strategies for overcoming barriers to implementation.

Costs - not mentioned

Innovation – tiered care models with centralised intake and stabilisation of patients with ongoing management in community settings.

**Hostetter M and Klein S (2017). In Focus: Expanding Access to Addiction Treatment Through Primary Care. The Commonwealth Fund.** Available from:

<https://www.commonwealthfund.org/publications/2017/sep/focus-expanding-access-addiction-treatment-through-primary-care>

This article examined four models of delivering addiction treatment within primary care.

1. A state-led model in which primary care practices receive additional resources and support - Vermont's "hub and spoke" model to reduce long waiting lists for treatment is described. Designated addiction treatment "hubs," serve the most clinically complex patients, and "spokes," which are primary care offices willing to provide MAT to less complex patients. Hubs are staffed by psychiatrists and care coordinators, accommodating daily dispensing of medication.
2. A model pioneered in rural health clinics - Open Door Clinics, a group of 11 rural health centres pursued a waiver to prescribe buprenorphine. The model is structured around group visits, each involving six to 12 patients which enables the clinics to cover the cost of drug counsellors and nurses, whose services aren't billable. Clinicians have access to a consulting psychiatrist.
3. A "low-threshold" approach to treating addiction in an urban setting - Bellevue Hospital where patients undergo initial screening and receive a one-week prescription for buprenorphine-naloxone. Although encouraged, patients are not required to receive counselling, nor is treatment automatically suspended if they fail a screening for illicit substances.
4. A model developed to treat complex patients in an integrated primary and behavioural health care clinic- Center for Integrative Medicine was designed to treat patients who repeatedly turn up in the emergency department. About 70% have a substance use disorder, so the clinic provides MAT to these patients.

Barriers to expanding treatment in primary care include that many providers are already overwhelmed and a lack of financial incentives. Levers for overcoming these barriers include training during medical school and via continuing medical education programs and creating financial incentives and supportive policy. Policymakers must recognise that addiction is a chronic disease that requires long-term treatment.

Costs - not mentioned

Innovation – not mentioned

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