# RESEARCH

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# Cost analysis of MOUD implementation and sustainability in Massachusetts jails



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# Abstract

**Background** In 2018 Massachusetts mandated that county jails offer all FDA-approved medications for opioid use disorder (MOUD) to incarcerated individuals with OUD. Estimating costs needed to implement and sustain an MOUD program are not clearly known in jail facilities. The objective of this study was to identify the type of MOUD model deployed by the jails serving as research sites for the Massachusetts JCOIN hub, determine which resources were utilized at each stage of development, and estimate the associated costs.

**Methods** Resources required to implement and sustain the MOUD programs were identified through detailed, site-specific microcosting analyses at six participating jails in Massachusetts. Quantitative resource utilization data were captured primarily through in-person site-visits and semi-structured interviews with key personnel. Unit costs were derived from the Federal Supply Schedule and Bureau Labor of Statistics from a site-specific level perspective. Our customizable budget impact tool, designed to assist jails/prisons with assessing the viability of alternative MOUD models, was used to organize each site's resources and estimate their associated costs. Resources/costs were summarized by site, according to type and phase, and cross-site comparisons were made to identify common program elements and unique models.

**Results** Three MOUD models were identified. Model 1 consisted of a vendor hired to deliver and administer methadone daily, while clinical jail staff administered buprenorphine and extended-release naltrexone. Model 2 included facilities that hired a certified vendor to operate an in-house opioid treatment program (OTP) to oversee the administration of all MOUD. Jails in Model 3 became certified OTPs, thereby allowing jail staff to manage all aspects of the MOUD program. There was considerable variability in implementation costs, both within and across models, driven by model-specific factors, but also with switching models, expanding infrastructure, etc. Entering the sustainment phase, the per-person costs of care were quite similar across models but differed according to the proportion of costs considered time-dependent vs. variable.

**Conclusion** Our findings represent the most detailed and comprehensive estimates of resource/cost requirements for jail-based MOUD programs. Given the budget constraints faced by jails, the investment required to implement/ sustain an MOUD program will likely result in the need to obtain additional funding or reallocate existing resources away from other initiatives.

Keywords Cost, MOUD, Jails

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# Introduction

An estimated 15% of the 1.8 million incarcerated individuals in the U.S. have an opioid use disorder (OUD) (Thakrar 2023; Mancher 2019; Kang-Brown 2020). Most carceral facilities discontinue medications for opioid use disorder (MOUD) upon entry, then do not initiate and link people to community-based MOUD at release. This ultimately increases risk of overdose due to lower opioid tolerance relative to the highly variable and unpredictable potency of the street opioid supply (Binswanger et al. 2013; Krawczyk et al. 2017; Moore et al. 2019).

As the opioid overdose crisis enters its third decade, the U.S. is now witnessing a concerted policy effort to expand access to MOUD in carceral settings, including local jails (Pourtaher et al. 2023). In 2018, Massachusetts (MA) mandated that all FDA-approved MOUD be offered to incarcerated individuals with OUD in its county houses of correction (HOC, i.e. jail) settings. The law (Chap. 208) stipulates that HOCs must offer to continue MOUD for individuals receiving it prior to detention, initiate MOUD prior to release among sentenced individuals where appropriate, and facilitate continuation of MOUD in the community upon release from incarceration (An 2018). The Justice Community Opioid Innovation Network (JCOIN) Massachusetts Research Hub partnered with seven HOCs, the MA Department of Public Health, and community treatment providers to conduct a Type-1 hybrid effectiveness-implementation study of Chap. 208 (Evans et al. 2021; Murphy 2021). By leveraging Massachusetts' early adoption of these policies, the study promises to provide significant insights for future stakeholders at the national, state, and local levels. Among the most pressing stakeholder concerns to be addressed by this study is the fiscal impact of introducing MOUD programming within carceral settings (Grella et al. 2020).

Healthcare budgets in jails are typically constrained and completed a year in advance, thus uncertainty surrounding the resources and associated costs needed to implement and sustain a MOUD program can serve as a significant barrier to adoption. The MOUD delivery model options available to a given facility will differ according to their existing services, the treatment resources in their community, and regulatory oversight. Examples of MOUD delivery models are transporting incarcerated individuals to an Opioid Treatment Program (OTP) for medication dosing, partner with OTPs for one or more medications where (1) dosing is provided by contracted vendors who come in the facility everyday to administer or (2) contracted vendors work under their OTP license in-house of the correctional facility to provide MOUD, a correctional facility obtaining an OTP license on their own, or obtain a Drug Enforcement Agency (DEA) and state license as a healthcare facility. The objective of this study was to categorize the MOUD delivery models used by each HOC research site in Massachusetts, determine which resources were utilized by the site at each stage of development/execution, and estimate the associated costs.

# Methods

A detailed, site-specific microcosting analysis on six of the seven Massachusetts county jail sites identified the resources required to implement and sustain carceral MOUD programs. One jail was omitted because of incomplete data. Quantitative resource utilization data were captured primarily through in-person site visits and semi-structured interviews with key personnel conducted in 2019-2022 (Gold et al. 2022; Neumann and Sanders 2017). Personnel identified as most salient were those involved in the planning and day-to-day operations of the MOUD program, which included superintendents, assistant superintendent(s), sheriffs, lieutenants, nurses, medical directors, physicians, and correctional officers. The Drug Abuse Treatment Cost Analysis Program (DATCAP) instrument guided the interviews (French et al. 1997). We developed a customizable budget impact tool to assist carceral facilities with assessing the viability of alternative MOUD models (Ryan et al. 2023). This tool was used to organize each site's resources and estimate their associated costs, assuming a 5-year cost estimateUpon completion of all tools, cross-site comparisons were made to identify common program elements and unique models. Site characteristics and program costs were also evaluated and summarized in tables and figures.

The budget impact tool, which is publicly-available and described in detail in Ryan et al., (2023; The Center for Health Economics of Treatment Interventions for Substance Use Disorder, HCV, and HIV (CHERISH) n.d.) allows users to organize resources according to how they are deployed for the intervention (fixed startup, time-dependent, variable), then assigns nationallyrepresentative price weights to estimate costs by phase (implementation, sustainment). Wage and fringe rates were obtained from the Bureau of Labor of Statistics (n.d.). Administrative data regarding the average number of incarcerated individuals receiving MOUD for induction and maintenance on a monthly basis were obtained from the Massachusetts Department of Public Health. All monetary values were expressed in 2023 USD and was costed from a site-level perspective.

Fixed start-up resources/costs are incurred only once in the early stages of implementation. Examples of fixed start-up costs for implementing MOUD in jails included construction/renovation of an on-site dispensary, licensure and accreditation, and interim medication delivery. Time-dependent resources/costs are incurred on a recurring basis but are then fixed over a period of time. Time-dependent resources/costs included on-going meetings, accreditation, and contracted vendor fees. Variable resources/costs are a direct function of the number of individuals treated and included medication dosing, counseling services, and biological testing supplies. We define the implementation phase of the intervention to be the period leading up to the steady-state phase, during which time the fixed start-up costs are also paid off; thus, the implementation phase consists of all costs incurred over that period (fixed start-up, time-dependent, variable) (Fig. 1). For this study, the implementation phase spanned 12 months. The sustainment phase then reflects the time-dependent and variable resources/costs that would be required in a typical year following the completion of the implementation phase. Finally, a per-patient sustainment cost was calculated for both MOUD induction (initiated MOUD while incarcerated) and MOUD maintenance (continued MOUD that had been initiated prior to incarceration and while in the community). Service delivery models were determined based on similarities across methods. For example, sites were grouped based on (1) hiring a vendor to be on or off site, (2) the type(s) of MOUD a vendor would administer, or (3) the jail becoming certified as an opioid treatment program (OTP) on their own.

#### Results

#### Program models

Table 1 provides additional details about each facility. For instance, five of the six facilities are defined as metropolitan (varying by population size) (Economic Research

Service U.S. n.d.) settings. The average daily population of the facilities ranged from 125->1,000. The monthly number of those who screen positive for an OUD ranged from an average of 13–395 incarcerated individuals. The monthly average receiving MOUD induction and maintenance ranged from 6 to 48 individuals for methadone, 11–75 individuals for buprenorphine (tablet only), and 1–5 individuals for extended-release naltrexone. Two facilities switched their MOUD delivery model during the implementation phase. The total monthly average of patients receiving MOUD was multiplied by 12 and used as a denominator to estimate the annual per patient costs.

We categorized the MOUD delivery approaches of the six jails into three models. Model 1 (Contract for Methadone Maintenance, N=2) jails contracted with a certified external vendor to deliver and administer methadone daily to incarcerated individuals, who entered the facility with an existing prescription from a community provider (methadone induction was typically not offered). Moreover, clinical jail staff were in charge of facilitating induction and/or maintenance of buprenorphine and extended-release naltrexone. Model 2 (Contract for all Induction & Maintenance, N=2) facilities contracted with a certified vendor to operate an in-house opioid treatment program (OTP) (Substance 2022) to oversee the induction and maintenance of all three types of MOUD. In Model 3 (Jail OTP Certification,N=2) jails underwent the OTP certification process to operate their own in-house OTP and manage all factors relating to the MOUD program, including induction and maintenance for all medications.

All models were required to be approved by federal and state regulatory agencies (i.e., federal entities, such

Implementation Phase		$\longrightarrow$	
	Sustainment Phase		
Fixed Start-up	Time-Dependent	Variable	
Equipment	Meetings	OUD Medications	
Start-up Meetings	Trainings	OUD Assessments	
Trainings	Accreditation and Licensing Fees	Medication Dosing	
Information Technology Services (ITS)	Contracted Vendor Fees	Counseling	
Construction/Renovation		Testing Supplies	
Application Process			
Interim Medication Delivery			

Fixed Start-up- one-time costs Time-Dependent- costs that are re-occur over a fixed time period Variable-direct cost of a patient

Fig. 1 Microcosting resources

# Table 1 Jail characteristics

	Model 1: Contract for Methadone Maintenance		Model 2: Contract for All Induction & Maintenance		Model 3: Jail OTP Certification	
	Site A	Site B	Site C	Site D	Site E	Site F
Average Daily Population	>600	> 300	> 1,000	> 1,000	>150	>125
Switched MOUD Program Type During Implementa- tion	YES	NO	NO	NO	NO	YES
Setting* Economic Research Service U.S. (n.d.)	Major Metro*	Major Metro*	Major Metro*	Large Metro**	Nonmetro***	Small Metro****
Monthly Average Number of those who Screen Positive for an OUD	146	101	392	236	56	13
Monthly Average Number of Patients Receiving MOUD						
Methadone	19	11	21	48	21	6
Buprenorphine	32	26	44	75	11	6
Extended-Release Naltrexone	5	1	3	2	2	1
Total Monthly Average Number of Patients Receiv- ing MOUD	56	38	68	125	34	13
Annual Average of Patients Receiving MOUD	672	456	816	1500	408	156

\* https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/

\*Major Metropolitan area is considered a population of 1 million or more

\*\*Large Metropolitan area is a population of 250,000-1 million

\*\*\*Nonmetro area has a population of 20,000 or more

\*\*\*\*Small metro has a population fewer than 250,000

as Substance Abuse and Mental Health Services Administration [SAMHSA] and Drug Enforcement Agency [DEA] and state entities, such as Massachusetts Bureau of Substance Addiction Services [BSAS]) each year. A new OTP received provisional certification for up to one year during which time staff applied for OTP accreditation (Substance 2022). Once the site was officially accredited, a renewal/recertification occurred depending on the awarded timeframe.

The processes for induction and maintenance of each medication were similar across models. Induction typically required separate ~60 min appointments with clinicians (i.e., nurse practitioner, physician assistant), whereas medication maintenance required only one ~30–60 min appointment with a clinician to continue medication. The administration of buprenorphine involved a lengthier process, typically consisting of a clinician crushing the tablet (most commonly buprenorphine/naloxone) and placing it under the individual's tongue followed by a 15-minute observation by security officers as the tablet dissolved. Some facilities also provided water and a cracker to ensure the tablet was fully ingested.

# Costs of program models

#### Model 1: contracted for Methadone maintenance

Table 2 presents the costs associated with Model 1. The total implementation costs were \$2.7 million for Site A

#### Table 2 Model 1 costs

Model 1 - Contracted Methadone Maintenance: A vendor is contracted to deliver and administer methadone daily for those who maintain a prescription; jail staff deliver buprenorphine and extended-release naltrexone

	Site A	Site B
Fixed-Start Up	\$1,611,987	\$393,261
Costs in Previous Model	\$1,580,751	
Renovation		\$77,882
Meetings and Trainings	\$25,748	\$43,515
Supplies and Equipment	\$5,488	\$271,864
Time-Dependent	\$773,906	\$516,845
Vendor/Accreditation Fees	\$711,575	\$455,822
Meetings and Trainings	\$62,331	\$61,023
Variable	\$351,757	\$251,999
OUD Medications	\$20,872	\$13,687
OUD Assessments & Testing Supplies	\$96,005	\$77,204
Medication Dosing	\$215,629	\$161,108
Counseling (Group & Individual)	\$19,256	
Implementation	2,737,650	\$1,162,105
Sustainment	\$1,125,663	\$768,844
Annual Per Patient	\$1,675	\$1686
Monthly Per Patient	\$140	\$141

and ~\$1.1 million for Site B; however, Site A changed models and vendors (from initially pursuing Model 2) during the implementation phase, which resulted in additional expenditures. The resources associated with Site A's initial vendor accounted for ~\$1.6 million in vendor fees, including the vendor's ITS software system for those receiving MOUD, furniture and supplies, trainings, interagency meetings, interim medication delivery, accreditation fees, and medication delivery. Although Site A was able to leverage many of the resources associated with the initial vendor model (e.g., ITS, furniture, supplies), an additional \$31,236 worth of fixed start-up resources were still required for the new vendor model. The following resources were required to facilitate the vendor change: additional meetings, training new vendors, and purchasing extra locked medication storage carts. The fixed start-up cost for Site B was just under \$394,000, which included renovations, supplies, ITS equipment, meetings, and trainings for the vendor and for data entry. The timedependent costs were \$773,906 for Site A and \$516,845 for Site B. Time-dependent resources/costs for both sites included the vendors' monthly fee, internal meetings, and annual trainings from regulatory agencies. The variable costs for Sites A and B were \$351,757 and \$251,999, respectively. These costs included the induction process, medications, group dosing, and supplies. The induction process in Sites A and B involved a MOUD clinician (i.e., nurse practitioner, physician assistant) and a physician appointment, whereas a maintenance evaluation consisted of one clinician verifying the active MOUD prescription. Buprenorphine dosing for incarcerated individuals was typically done in groups (8-10 patients per group) and involved one nurse and two security officers at both sites. Summing the time-dependent and variable costs resulted in the following annual sustainment cost estimates: Site A = \$1,125,663 (\$1,795/patient; \$150/ patient-per-month), Site B = \$768,844 (\$1,686/patient; \$140/patient-per-month).

# Model 2: contracted for all induction & maintenance

Sites C and D contracted for all induction and maintenance, for which the implementation phase costs were ~3.4 million and ~5 million, respectively. The fixed start-up cost was \$1,065,891 for Site C and ~22,216,060 million for Site D. The fixed start-up costs for both sites included construction of a dispensary, IT services, trainings, and interagency meetings. While Site C's dispensary was being built, the jail had an interim medication delivery protocol where jail staff traveled to a partnered community-based OTP to retrieve the medications. Site C's IT services included integrating the vendor's software for MOUD status, whereas Site D created their own IT software using jail staff. Additionally, both sites had vendor staff trainings. Site C's time-dependent costs were over \$2.0 million, and Site D's time-dependent costs were ~\$2.7 million. The time-dependent costs consisted of monthly vendor fees, trainings, meetings, and state and federal regulatory agencies' certification fees. Regulatory agencies' trainings were completed annually for both sites with interagency meetings held for supervisors and clinical staff. The monthly vendor fee differed across sites, according to each site's service agreement. Site C paid an administrative fee to operate the OTPand an additional per-patient cost for medication and dosing, while Site D's service agreement bundled services and included vendor staffing, medication, counseling, dosing, and discharge planning. The variable costs for Sites C and D were \$342,358 and \$84,561, respectively. Site C's contract has an additional cost per patient for OUD treatment that is accounted for in variable costs. Site D had multiple facilities where the contracted nurse traveled with a correctional officer to transport medication to different buildings. The correctional officer's time was accounted for in the variable costs. The annual sustainment costs for Sites C and D were \$2.3 million (\$2,905/ person; \$242/patient-per-month) and \$2.7 million (\$1,860/person; \$155/patient-per-month), respectively (Table 3).

#### Table 3 Model 2 costs

Model 2 – Contract for All Induction & Maintenance: A vendor is contracted to operate an in-house program to deliver all forms of MOUD within the jail

	Site C	Site D
Fixed-Start Up	\$1.065,891	\$2,216,060
Dispensary	\$995,795	\$1,162039 <sup>a</sup>
Meetings & Trainings specifically for Jail staff	\$12,587	\$1,000,335
Supplies/equipment	\$15,510	
Interim Medication Delivery	\$27,682	
Information Technology Services	\$14,317	\$53,686
Time-Dependent	\$2,022,842	\$2,706,170
Vendor/Accreditation Fees	\$1,912,323	\$2,667,556
Meetings and Trainings	\$96,775	\$38,614
Information Technology Services	\$13,744	
Variable	\$342,358	\$84,561
OUD Treatment	\$309,079	\$19,698
Medication Dosing	\$18,152	\$17,981
Counseling (Group & Individual)	\$15,127	
Miscellaneous Costs		\$46,882
Implementation	\$3,431,091	\$5,006,791
Sustainment	\$2,371,200	\$2,790,731
Annual Per Patient	\$2,905	\$1,860
Monthly Per Patient	\$242	\$155

<sup>a</sup> Dispensary costs in Site D included the supplies/equipment

#### Model 3: jail OTP certification

Sites E and F pursued their own internal OTP certification and licensure for which the cost for the implementation phase was ~\$598,000and ~\$1.1 million, respectively. The fixed start-up cost was \$143,855 for Site E and \$875,328 for Site F. Site E pursued an OTP from the start, incurring fixed start-up costs for supplies, OTP license and accreditation, trainings, and meetings. Prior to becoming a licensed OTP, Site F had initially contracted with a vendor, which amounted to \$523,640 for supplies, ITS (i.e., integrating MOUD data into existing electronic record systems), meetings, trainings, medication delivery and dosing. Site F transitioned models requiring the purchase of additional supplies for the dispensary and interim medication delivery to support the process of becoming their own OTP. As the dispensary was being built, security personnel picked up medication to ensure the continuation of dosing patients. The time-dependent costs were \$98,561 for Site E and \$66,696 for Site F. Timedependent costs for both sites included regulatory agency fees, annual audits, electronic prescribing license, and meetings. The variable cost was \$355,505for Site E and \$180,251 for Site F. The variable costs included medication, screening for OUD, and group and individual counseling sessions. The sustainment costs for Sites E and F were \$454,066 (\$1,112/person; \$93/patient-per-month) and \$246,947 (\$1714/person; \$131/patient-per-month), respectively. See Table 4.

# Discussion

These findings are the most detailed and comprehensive estimates of resource/cost requirements for carceral MOUD programs. The enactment of MA State law (2018), Chapter 208, mandating HOCs (i.e. jails) to screen for OUD, provide MOUD treatment, and facilitate post-release care opened avenues for the NIDA-funded JCOIN Massachusetts Research Hub to collaborate with state jails to conduct precise site-specific microcosting analyses. As a result, three different models of MOUD delivery were identified across the six jails included in this study. Model 1 contracted with a vendor to administer methadone daily to incarcerated individuals with existing prescriptions from community providers, while clinical jail staff were responsible for buprenorphine and extended-release naltrexone delivery. Model 2 involved facilities contracting with a certified vendor to run an in-house OTP to provide induction and maintenance of all three types of MOUD. Jails in Model 3 engaged in the complex regulatory process to obtain their own internal OTP certifications and licenses allowing their employed staff to provide induction and maintenance for all three FDA-approved MOUDs.

#### Table 4 Model 3 costs

Model 3 - Jail OTP Certification: The jail obtains OTP licensure to deliver all forms of MOUD within the jail.

	Site E	Site F
Fixed-Start Up	\$143,855	\$875,328
Costs in Previous Model		\$523,640
OTP Application Process	\$74,647	\$155,628
Meetings and Trainings	\$49,522	
Supplies and Equipment	\$19,686	\$196,060
Time-Dependent	\$98,561	\$66,696
Accreditation Fees	\$8,190	\$8,823
Renewal of Accreditation	\$16,035	
Meetings and Trainings	\$70,843	\$56,955
Information Technology Services	\$3,493	\$918
Variable	\$355,505	\$180,251
OUD Medications	\$	\$4,372
OUD Assessments & Testing Supplies	\$120,350	\$46,536
Medication Dosing	\$182,264	\$122,445
Counseling (Group & Individual)	\$17,902	\$6,898
Implementation	\$597,921	\$1,122,275
Sustainment	\$454,066	\$246,947
Annual Per Patient	\$1,112	\$1,582
Monthly Per Patient	\$93	\$131

Implementation costs varied considerably both within and across models. Within Models 1 and 3, facilities that chose to modify their initial model had substantially higher implementation costs due to sunk costs for the initial model that were lost in the switch. Changing models can be costly, however the correctional facility may not have any other option than to switch because of vendor staff turnover, communication (misinformed and/ or weak working relationships and contracted staff shortages. This observation may suggest an advantage for late adopters who are able to learn from the successes and challenges of jails that adopted a MOUD program earlier.

The largest implementation costs were associated with Model 2 (Sites C and D). Model 2 contracted with an authorized OTP vendor to provide all three forms of MOUD; however, Sites C and D were required to construct a dispensary, which drove up their implementation costs. The fixed start-up costs were even greater in Site D than C. Site D comprised multiple facilities with a larger overall population, which accounted for greater costs in meetings and trainings. Site D also used their own ITS staff to develop software for the MOUD program, whereas Site C used outside contractors.

Interestingly, after assuming the fixed start-up costs and entering the sustainment phase, the per-person marginal costs of care were similar across models (Fig. 2). The largest per-person sustainment costs were associated



with Model 2. The sustainment costs for Model 2 also consisted of the largest proportion of time-dependent versus variable factors as a result of recurring vendor fees varying based on the extent of bundled services included in the contract. For example, Site C had a standard daily dose rate for treatment regardless of the type of medication, whereas, in Site D, all bundled services were included in the monthly vendor fee. The larger the proportion of time-dependent costs, the greater the site's ability to lower their per-person cost of care by expanding their patient population; however, the extent to which they were able to do so depended on the structure of the contract. For example, contracts may have included an increase in the monthly rate after reaching a certain patient threshold. On the other hand, sites that became a certified OTP (Model 3) had the largest proportion of variable costs, which was associated with less ability to capture economies of scale, especially for small jails. Contrarily, a larger proportion of variable costs had advantages from a budgeting perspective, such as enhanced transparency of per-person cost drivers that enables expense optimization and more predictable and manageable budget planning.

Massachusetts jails were originally given state funding to create MOUD programming during this pilot phase set to end in 2024, after which the program will likely become part of the usual operation of jails in MA. This paper offers information jails can use to explore options and better prepare for implementation. For example, visiting or speaking to a facility with similar characteristics (i.e., average daily population, number of buildings, proximity to OTP) can help facilities understand what others have learned in the process and provide opportunities for training and educating staff on the benefits of MOUD. Table 5 provides additional helpful insights on how to begin thinking about MOUD models.

The primary strength of this paper derives from our unprecedented access to multiple jails and their personnel tasked with designing, implementing, and running three different models of MOUD delivery; however, this study has a number of important limitations. COVID-19 had an impact on the population size in facilities and it is anticipated that the number of those receiving MOUD will increase over time. All jails in the study were in Massachusetts, which limits generalizability to carceral facilities in other states with different legal constraints, healthcare budgets, and other contextual realities. Relatedly, cost is not the only consideration for jails considering implementation of a MOUD program. A jail's choice of MOUD model will likely consider other factors, such as average daily population, proximity to an OTP, local vendor options and fees, existing staffing models, and the size of the facility. This study only accounted for one type of buprenorphine tablet (buprenorphine/ naloxone), where jails have multiple options, such as injectable buprenorphine, the buprenorphine monoproduct, and

# Table 5 Helpful insights

#### **Helpful Insights**

(1) Visit/Speak with jails who have similar characteristics (average daily population, number of buildings, proximity to OTP) and implemented MOUD

• It can reduce your chance of having to switch models, that can drive up implementation costs

· Learn from their experience with license and accreditation

(2) Build relationships with your local OTP

• Knowing the community OTPs and what they offer can create an easier transition for release

(3) Understand what the vendors are offering

- Develop a contract that pays for bundled services (i.e., will vendor ensure medication continuity post release?)
- Provide a reasonable patient capacity
- What type of service(s)? (i.e., maintenance, induction or both)
- What is the cost difference using vendor staff vs. jail staff to create ITS services or build the dispensary?

(4) Educate/Train staff on OUD

· Should it be a recurring training? (i.e., annual)

#### (5) Potential Space

Is there space not being used to have a dispensary

Can one room serve more than one purpose?

buprenorphine film. Additionally, we were unable to obtain information from one of the original seven sites along with the cost of license renewal for Site F, which could have increased their time-dependent costs.

# Conclusion

Although carceral settings are increasingly offering pharmacotherapy to clients with OUD, few studies have estimated the required resources and costs associated with MOUD implementation. Given the fixed and limited budgets faced by carceral settings, the investment required to implement and sustain a MOUD program will likely result in the need for jails to obtain additional funding or reallocate existing resources from other initiatives. Depending on the perspective, the cost per patient may vary. For example, Brady et al. found an average weekly cost for jail based methadone maintenance treatment was \$115 (assuming \$460 monthly per patient) in an urban jail and Zarkin et al. found that interim methadone cost was \$509 per patient in jail. The findings from this study, in conjunction with our publicly-available and customizable budget impact tool (Ryan et al. 2023), will assist interested facilities in making informed decisions regarding the feasibility and potential challenges of adopting alternative MOUD programs.

# Supplementary Information

The online version contains supplementary material available at https://doi. org/10.1186/s40352-025-00321-z.

Supplementary Material 1.

#### Authors' contributions

DAR and SMM contributed to the conception of the work, interpreted the data, and wrote the original draft . DE, EH, EE, TS, PF, KM contributed to the writing, reviewing and editing. All authors reviewed the final manuscript.

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#### Data availability

No datasets were generated or analysed during the current study.

#### Declarations

Ethics approval and consent to participate Not applicable.

#### **Competing interests**

The authors declare no competing interests.

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