Clayman *et al. Health & Justice* (2025) 13:22
https://doi.org/10.1186/s40352-025-00333-9

Health & Justice

RESEARCH Open Access

Factors contributing to the expansion of medication for opioid use disorder (MOUD) within the New Hampshire Department of Corrections (NHDOC)

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Abstract

Introduction Expanding access to medication for opioid use disorder (MOUD) to people involved in the carceral system is a priority for the New Hampshire Department of Corrections (NHDOC), where more than 40% of residents have an opioid use disorder (OUD). NHDOC participated in the multi-site Justice Community Opioid Innovation Network (JCOIN) clinical trial, "Long-acting buprenorphine vs. naltrexone opioid treatments in criminal justice system-involved adults (EXIT-CJS)". We examine the contributing factors to the expansion of the NHDOC MOUD program from 2021 to 2023, including participation in EXIT-CJS, which occurred from 2019 to 2024.

Methods Data on quarterly MOUD prescribing and EXIT-CJS enrollments were abstracted from the NHDOC medical records from July 1, 2021- December 31, 2023 as part of a quality improvement initiative. To examine factors influencing expansion of the program, conversations were conducted with NHDOC leadership team and clinical staff.

Results From 2021 to 2023, the quarterly number of patients treated with MOUD at the NHDOC increased by more than 400% from a total of 165 patients in July-September 2021, to 685 patients in October-December 2023. At the policy level, elimination of the federal DATA-Waiver (X-Waiver) Program allowed additional providers to prescribe MOUD. At the organizational level, support from NHDOC leadership, including Medical and Forensics and the Commissioner's Office, encouraged broader engagement in MOUD from providers, multidisciplinary staff, and security. This work was augmented through receipt of State Opioid Response (SOR) dollars with a requirement to continue to advance education for NHDOC staff on the efficacy of MOUD. Resulting discussions between medical providers, experts on addiction treatment, staff and residents supported a culture change in attitudes about MOUD. During this same time window, the NHDOC made significant adjustments in the distribution of MOUD by adjusting the nursing administration process thus reducing the stigma associated with being a patient on MOUD and treating MOUD medication administration like all other medical conditions.

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Discussion Policy-related, organizational, and individual factors contributed to the expansion of the MOUD program at the NHDOC. EXIT-CJS recruitment occurred synergistically with the expansion of the MOUD program. As NHDOC was engaged as a site in EXIT-CJS, study recruitment increased awareness of extended-release treatment options among residents and staff.

Keywords Medication for opioid use disorder (MOUD), Opioid use disorder, Carceral settings, Implementation

Introduction

Background

In the United States (US), approximately 6–7 million people currently meet the criteria for an opioid use disorder (OUD) (Keyes et al., 2022). Within this population, a disproportionately high number of individuals are involved in the criminal legal system (National Institute on Drug Abuse (NIDA), National institutes of Health, & U.S. Department of Health and Human Services, 2020). One recent study found that more than 50% of people meeting OUD criteria for the past year were also involved in the criminal legal system (Winkelman et al., 2018). Nationally, an estimated 47% of adults experiencing incarceration meet criteria for a substance use disorder (SUD) diagnosis, with fewer than half receiving any treatment during incarceration (Maruschak et al., 2021). In the first two weeks after release from incarceration, the risk of death was 12.7 times higher than among other state residents, with a markedly elevated risk from drug overdose (Binswanger et al., 2007).

Given these significant challenges faced by individuals with OUD who have experienced incarceration, it is imperative to implement effective treatment for OUD in carceral settings which should include harm reduction principles such as access to overdose reversal medications at time of release and post release re-entry care coordination for at least 12 months. Medication for opioid use disorder (MOUD) is an effective, evidence-based treatment for OUD that should be implemented within federal and state carceral systems (Bovell-Ammon et al., 2024). Food and Drug Administration (FDA) approved medications, including buprenorphine, naltrexone, and methadone, reduce rates of opioid-related mortality and recurrence of opioid use during reintegration into the community (Cates & Brown, 2023; Farrell-MacDonald et al., 2014; Merrall et al., 2010). Studies have reported that individuals who participate in a MOUD program before release from incarceration have improved health outcomes, including increased rates of participation with community treatment (Brinkley-Rubinstein et al., 2018; Cates & Brown, 2023; Moore et al., 2019), reductions in opioid use (Brinkley-Rubinstein et al., 2018; Cates & Brown, 2023; Moore et al., 2019), lower rates of recidivism (Sharma et al., 2016), and a significantly lower chance of fatal overdoses after release (Cates & Brown, 2023; Farrell-MacDonald et al., 2014; Merrall et al., 2010). Despite the effectiveness of MOUD for improving outcomes for persons with OUD (Larochelle et al., 2018; Ma et al., 2019; Moore et al., 2019; Sordo et al., 2017), carceral systems in the US have often struggled to implement MOUD programs due to numerous barriers (Friedmann et al., 2012; Nunn et al., 2009; Rich et al., 2005; Scott et al., 2021). Implementation of MOUD in carceral systems is often hampered by a shortage of qualified medical providers and staff (Fiscella et al., 2018; Friedmann et al., 2012), funding challenges (Scott et al., 2021), regulatory barriers (Fiscella et al., 2018), leadership and staff beliefs including stigma about MOUD (Friedmann et al., 2012; Nunn et al., 2009; Pfaff et al., 2024; Rich et al., 2005), and security staff concerns about diversion (Friedmann et al., 2012; Rich et al., 2005).

MOUD at the New Hampshire Department of Corrections (NHDOC)

Expanding access to MOUD for people involved in the carceral system is a priority for the New Hampshire Department of Corrections (NHDOC), where more than 40% of people incarcerated in prison have an OUD diagnosis (New Hampshire Opioid Task Force & New Hampshire Governor's Commission on Alcohol and Other Drugs, 2019) and more than half of parole revocations were related to repeat non-compliance with treatment associated with SUDs and/or return to use of illicit substances causing a risk to public safety (Dardeau, 2022). Continuing to expand access to effective forms of OUD treatment and engaging persons at high risk for opioid-related harm in New Hampshire (NH) is critical to reduce mortality. The importance of effective treatment for OUD in NH was underscored by data gathered in the neighboring State of Massachusetts (MA), through the passage of Chap. 55 which provided extensive data on the impact of opioid use among people involved in the criminal legal system (Massachusetts Department of Public Health, 2017). When a person was released from prison in MA, their ability to re-enter society was threatened by the opioid crisis, just as in NH. The risk of opioid-related death following release from incarceration was more than 50 times greater than for the general public, with the rate of fatal overdoses during the first month after release being six times higher than during all other post-incarceration periods (Massachusetts Department of Public Health, 2017). Among people incarcerated in MA, who both were released and died between 2013 and

2014, opioid-related overdose was the cause of death for 40% of these people.

The NHDOC began a measured implementation of MOUD starting as early as 2010. Originally, the NHDOC focused primarily on the use of methadone for pregnant patients with OUD. Then from 2011 to 2019, the NHDOC took steps to advance the use of MOUD. With rising rates of overdose death in the NH community and increasing rates of OUD among residents at the NHDOC facilities, the NHDOC began a partnership with Alkermes in 2011. Patients were inducted on oral naltrexone as a bridge to extended-release naltrexone, which was provided at the time of release. This provision of naltrexone continued until a major expansion of the MOUD program in 2015, when oral naltrexone became available with buprenorphine as standalone MOUD options, though the use of oral buprenorphine was limited due to the DATA 2000's capping of patient caseloads. Patients eligible during 2015 through 2018 for inclusion in the MOUD program included: (1) Having a current DSM diagnosis of opioid use disorder; (2) 6 months of engagement in a psychosocial intervention for substance use treatment; (3) Demonstrated inability of psychosocial interventions alone to control addictive behaviors; and (4) Assessed by a clinician as possessing a commitment to achieving total abstinence from illegal substances and misuse of prescribed medications and/or alcohol as clinically indicated. Eventually in 2018, the NHDOC expanded access to both oral and injectable formulations of both naltrexone and buprenorphine. These were available to any patient meeting criteria for moderate to severe OUD at any time during incarceration, or to any patient entering the facilities with a prescription for MOUD.

Throughout the evolution of the NHDOC MOUD program, the NHDOC worked closely to provide formulations of MOUD that met patient need, were available in the community, and were cost-effective. An important element to providing any form of MOUD during incarceration, is an evaluation of the ability to maintain the treatment regimen upon release. When oral buprenorphine was originally adopted, transitioning patients to community treatment providers was challenging due to a limited number of community providers prescribing buprenorphine. When assessing the community provider landscape and noting an increasing number of NH providers attaining their X-Waiver, the NHDOC increased its use of oral buprenorphine. The NHDOC worked with the NH Department of Health and Human Services (DHHS) on the Medicaid formulary to ensure all current FDA approved forms of MOUD were covered under Medicaid. This was pivotal given the State of NH's adoption of expanded Medicaid and increased access to Medicaid post release for those exiting NHDOC facilities as an insurance benefit to cover the costs of treatment upon release.

The NHDOC has also implemented several supports beyond MOUD for patients with OUD. In 2018, through supportive funding from the State Targeted Response Grant, collaboration with providers, and advancing overall education to all staff and patients regarding the benefits of MOUD, the NHDOC received funding for a reentry care coordinator who provided women with assertive case management for one year post release. This assertive case management specifically focused on connecting women with treatment and removing any barriers to effective reintegration for those with OUD. In addition, State Opioid Response (SOR) funding provided naloxone kits to every person with an OUD exiting the NHDOC facilities, which marked the first implementation of harm reduction principles within the NHDOC. Over time, this program expanded to include three reentry care coordinators who offered the program to both females and males releasing with OUD. Through NHDOC's experience using reentry care coordinators, the NHDOC noted that this model increased community reintegration and reduced returns to incarceration within 12-months post-release (New Hampshire Department of Corrections, 2023).

In combination with MOUD, the NHDOC model to treat OUD has grown in line with relevant published research. Initial approaches included assessing for an OUD diagnosis through licensed alcohol and drug counselors (LADAC) screening and assessments, resulting in referrals to providers for consideration of MOUD treatment. After expanding the MOUD eligibility in 2018, the current process first affirms existing prescriptions at time of admission to a DOC facility. Verified prescriptions are continued seamlessly, mirroring the process used with other reported and verified pharmaceuticals. The NHDOC continues to use the American Society of Addition Medicine (ASAM) Criteria (American Society of Addiction Medicine (ASAM), 2023) as a means of assessment and treatment planning, while incorporating best practices from SAMSHA and the Association for Addiction Professionals.

Woven throughout the NHDOC's clinical treatment model history has been an incorporation of peer work and its importance, starting with certifying people incarcerated in Psychological First Aid then expanding under SOR funds to adding certification paths in Peer Recovery through a Certified Recovery Support Worker curriculum (CRSW). Recovery coaches who have completed their required class time but still are in the process of becoming a CRSW, perform the same interventions, such as educating their peers about substance use, recovery principles, and available resources. They advocate for recovery needs within the prison system,

ensuring treatment and recovery plans are respected. Additionally, they collaborate with mental health counselors when appropriate and correctional staff to create a holistic recovery environment while being supervised by NHDOC licensed alcohol and drug counselors (LADCs). This model ensures they are receiving the required supervision hours to move forward to certification. Recovery coaches hold supervised groups on the units and provide support throughout the day, when a LADC may not be available, if someone is struggling.

The NHDOC offers Focus Unit Programs, which are a modified therapeutic community with prison facilities: one for females and two for males who meet ASAM 3.5 assessment criteria. This Focus unit is one of many levels of treatment offered for those with SUDs within NHDOC system of care that has an emphasis on rehabilitation and wellness. This methodology bares the title of "Focus" in that the Intense Clinical treatment also encourages accountability and peer supports in a supportive environment that addresses SUDs while assisting residents in developing coping skills and wellness strategies for managing SUDs. Nurses at each facility are instrumental in preparing, administrating, and documenting MOUD administration, as well as providing ongoing care and follow-up. In addition, nurses are responsible for reporting missed doses of MOUD to the prescribing provider so that the provider can engage with patients and make informed next steps in treatment planning.

Project aims

In parallel to the NHDOC's efforts to expand their MOUD program, the NHDOC also engaged as a study site in the National Institutes of Health (NIH) Justice Opioid Innovation Network (JCOIN)-funded *"Long-acting buprenorphine vs. naltrexone opioid treatments in CJS-involved adults (EXIT-CJS)"* study (Waddell et al., 2021). This ongoing randomized controlled trial seeks to compare the effectiveness of extended-release buprenorphine versus extended-release naltrexone for adults with OUD involved in the criminal legal system. Participants were enrolled from all NHDOC facilities and inducted on study medication prior to release. While advancing MOUD expansion at the external, internal and individual levels within the NHDOC, the EXIT-CJS study was simultaneously being implemented. The aim of the present manuscript is to describe the confluence of factors contributing to the expansion of the MOUD program at the NHDOC, and to highlight how participation in clinical trials like EXIT-CJS can contribute to the synergistic expansion of evidence-based MOUD treatment in carceral settings.

Methods

Design

Statewide data on quarterly MOUD prescribing were abstracted from the NHDOC medical records for the purpose of program evaluation. The NHDOC Addiction Nurse Coordinator collected data on the quarterly number of patients treated with oral and injectable buprenorphine and naltrexone from the NHDOC electronic health record (TechCare EHR) from July 1, 2021, through December 31, 2023. The NHDOC Addiction Nurse Coordinator identified the cohort of interest (e.g., persons incarcerated in the NHDOC meeting Diagnostic and Statistical Manual (DMS) criteria for moderate to severe OUD who were receiving naltrexone or buprenorphine from July 1, 2021-December 31, 2023. As a quality improvement initiative, approval from an ethics board was not required and the authors did not seek a "Not Human Research" designation.

Setting

The NHDOC is a state-run prison system that operates facilities in urban and rural locations across the state of NH. The guiding mission of NHDOC is to provide a safe, secure, and humane correctional system through effective supervision and appropriate treatment of individuals, and a continuum of services that promote successful re-entry into society. Across three prison facilities, three transitional housing units, and one transitional work center, the NHDOC has an overall average population of approximately 1,960 people. Residents at the NHDOC facilities are 18 years of age or older and predominately White and not Hispanic or Latino (New Hampshire Center for Justice and Equity, 2024; New Hampshire Department of Corrections, 2023). Approximately 6% of residents are female. In addition to residents, the NHDOC has more than 700 full-time staff working within the facilities (New Hampshire Department of Corrections, 2023).

EXIT-CJS study

The EXIT-CJS study is a multi-site, pragmatic randomized controlled trial comparing the effectiveness of extended-release buprenorphine versus extended-release naltrexone to treat OUD among persons involved in the carceral system in six locations (New Hampshire, New Jersey, Connecticut, New York City, Delaware, and Oregon; (Waddell et al., 2021). NHDOC leadership collaborated with the research team to plan the study and then received all necessary approvals to conduct the study within the NHDOC facilities. In the NH site, participant recruitment started on July 1, 2021, and continued until December 31, 2023, overlapping the data collection period for the NHDOC MOUD program. The EXIT-CJS study allowed eligible residents in the NHDOC to access

extended-release buprenorphine and naltrexone if within 6 months of release. In total, 153 participants were eligible and enrolled in the EXIT-CJS study in NH. The New York University School of Medicine Institutional Review Board approved all study materials and methods for the EXIT-CJS study.

Methods and analysis

Statewide data on quarterly MOUD prescribing were abstracted from the NH DOC medical records for the purpose of program evaluation. Data on the number of persons receiving MOUD and the type of MOUD received during each quarter was extracted and reviewed by the MOUD team. This data was plotted to examine changes in the number of persons receiving MOUD. To examine factors influencing the expansion of the program, conversations were conducted with the NHDOC leadership team and clinical staff while reviewing the data showing the changes in MOUD prescribing. These conversations were informal and did not include rigorous qualitative methodologies, such as focus groups or interviews. Notes about the implementation of the MOUD program were taken and turned into a description of the implementation efforts used to increase MOUD prescribing at the NHDOC. The purpose of these conversations and notes was to identify factors contributing to program expansion and report on the evolution of program services across the NHDOC. These factors were then categorized into policy-level (or external), organizational, and individual factors.

Results

Expansion of MOUD prescribing at the NH DOC

From 2021 to 2023, the quarterly number of residents treated with MOUD at the NHDOC increased by more than 400% from a total of 165 residents in July-September 2021 to 685 residents in October-December 2023 (Fig. 1). The number of residents receiving buprenorphine-naloxone (Suboxone) increased most, from 82 residents receiving buprenorphine-naloxone in July-September 2021, to 611 residents receiving buprenorphine-naloxone in October-December 2023. Due to formulary changes, the numbers of residents receiving extended-release buprenorphine and naltrexone declined, as only those participating in the EXIT-CJS study were prescribed extended-release medications after October of 2021. The use of extended-release buprenorphine and naltrexone was reserved for patients who were not in secure facilities as an option for their treatment with an MOUD. In the final quarter of 2023, the NHDOC provided MOUD to an estimated 80% of residents with moderate to severe OUD.

Quarterly randomizations to extended-release buprenorphine and extended-release naltrexone in the New Hampshire EXIT-CJS study site similarly increased from July 2021 to December 2023 (Fig. 2). As study recruitment ended in 2023, there were no further enrollments of residents to receive injectable treatments for MOUD starting in 2024.

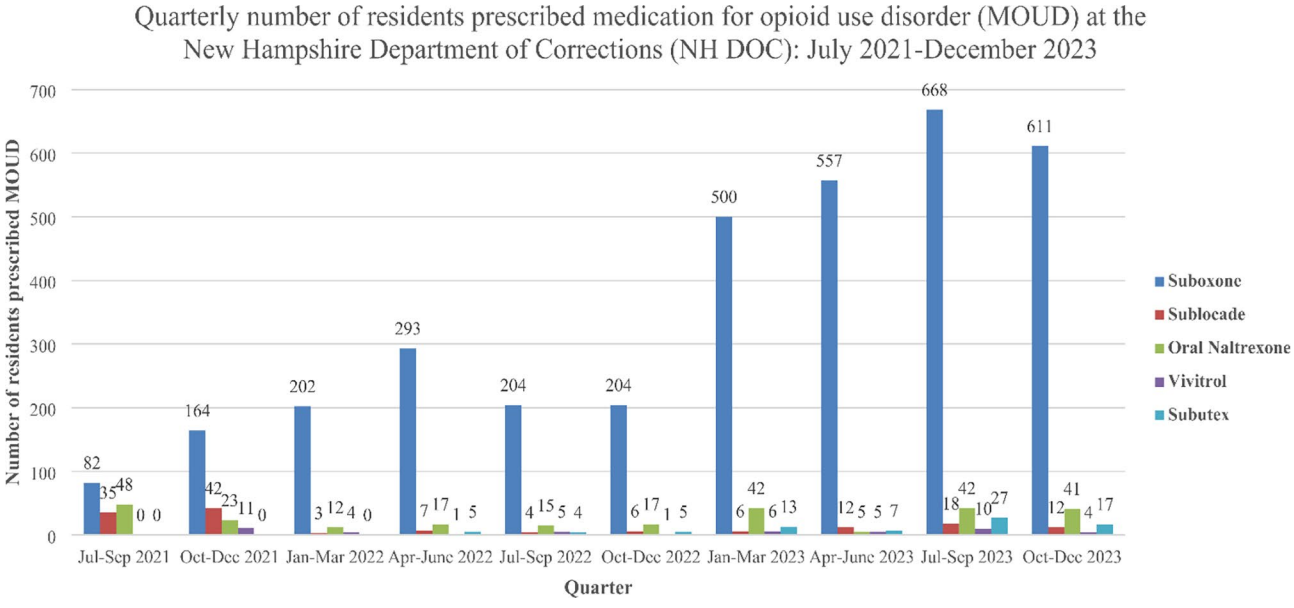

Fig. 1 Quarterly number of residents prescribed medication for opioid use disorder (MOUD) at the New Hampshire Department of Corrections (NH DOC), including EXIT-CJS study prescriptions: July 2021-December 2023

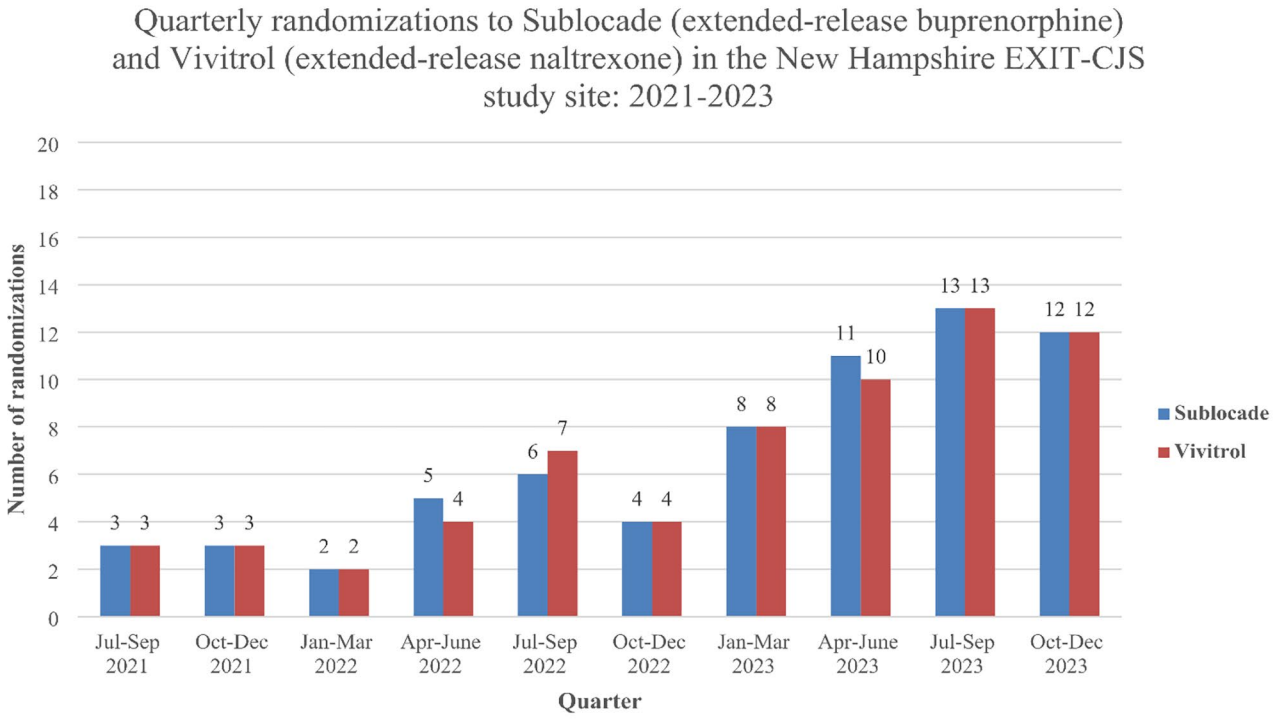

Fig. 2 Quarterly randomizations to extended-release buprenorphine and extended-release naltrexone in the New Hampshire EXIT-CJS study site: July 2021-December 2023

Factors influencing the expansion of MOUD prescribing at the NHDOC

Policy-level factors

Several major external policy-level factors supported the expansion of the NHDOC MOUD program. Elimination of the federal DATA-Waiver (X-Waiver) Program on December 29, 2022, was a critical federal policy change allowing additional licensed medical and psychiatric providers to prescribe MOUD to residents. After elimination of the X-Waiver, providers at the NHDOC prescribed MOUD more readily without limits, adjusting from primarily using naltrexone to including more buprenorphine and expanding treatment options. At this time, the providers were all hired under Wexford Health which required X-Waiver training. Under the principles of the X-waiver, the Department had 10 providers who had completed the X-waiver requirements. Of the 10, only one had the capacity to treat 275 patients, while all others were capped at 30 patients. Only one provider was assigned to the NHDOC women's prison with a cap of 30 patients, one provider with a cap of 30 was assigned to the Northern NH Correctional Facility in Berlin NH, and the rest of the X-Waivered providers were assigned to the facilities located in Concord, NH resulting in a potential for 485 patients within their waiver requirements. The number of available providers did not change after the elimination of the X-Waiver, but providers increased their caseload. It is important to state there was an overall underutilization of patient slots by providers based on their capacities as demonstrated by a total caseload of these 10 providers at all sites in March 2021 of only 94 patients on buprenorphine formulations. Discussions held to understand why there was an underutilization of patient slots included, providers needing more education to increase their confidence in prescribing, a series of intermittent vacancies in providers, and increased education needed for patients on OUD and its benefits as part of their treatment. The provider group at the time had only prescribed to 23% of those in the system with an OUD diagnosis in 2021. Now in 2024, the department has prescribed an OUD medication to 80% of those with a diagnosed OUD as part of their treatment plan in comparison.

The NHDOC also received expanded funding for MOUD through the NH State Opioid Response (SOR) grant in 2018 to fund purchasing of MOUD pharmaceuticals, providing certified peer recovery coaching courses to residents, funding staffing of three re-entry care coordinators and funding voluntary distribution of naloxone at time of release and available at the probation parole district offices throughout the State of NH. The NHDOC has continued to receive SOR funds each year since 2018.

Organizational level factors

Within the NHDOC, support from NHDOC leadership, including Medical and Forensics and the Commissioner's Office, encouraged broader engagement from medical providers, mental health providers, nursing, security, and other staff. NHDOC leadership consistently stated that expanding MOUD was a priority and supported organizational-level efforts to expand and improve the program. Due to post COVID-19 effects on recruitment of clinical staff, both nationally and in NH, NHDOC worked within the State's personnel rules to create a more competitive wage for clinicians working at the department to ensure continued treatment for mental illness and specifically to continue effective treatment of SUD. These efforts included seeking wage enhancements through the State's Governor and Executive Council that increased base wages by 25% for clinical staff to solidify retention and advance recruitment. These wage enhancements started on November 4, 2021.

In 2022, the Deputy Director of Forensic Services for NHDOC streamlined the MOUD Program Guidance, which clarified and simplified the process for starting a resident on MOUD. While initially residents were required to be engaged in counseling and other mental treatment prior to starting MOUD, the guideline was updated to reflect changes in the field of SUD treatment and provide a path for residents to engage in MOUD without being engaged in counseling. The NHDOC simplified the process to allow anyone with an OUD diagnosis to be evaluated by a provider and offered MOUD, also allowing residents and providers to engage in shared decision making about whether to prescribe buprenorphine or naltrexone. Education was provided to staff and residents on these changes and the corresponding workflow to improve ease of access and understanding of the process.

The process for managing diversion also evolved. While initially residents were referred for possible MOUD tapering if diversion was discovered, the process for managing diversion evolved, and now includes a meeting with the provider and patient first before any decision to taper off is made to evaluate each individual patient's case. Residents are now rarely taken off MOUD unless the conduct is clearly deliberate with the intent to engage in criminal diversion of medications, and providers can guide treatment based on evidence-based practices and patient engagement. Initiatives to address drug diversion were important to standardize workflows across disciplines particularly among security, nursing, medical, and mental health staff. Stakeholder meetings occurred at each facility with advocacy for improved communication and reporting from all parties within NHDOC who find diversion of medication. Additionally, the guidelines addressed policies for follow-up provider appointments to discuss diversion, MOUD adherence, dose titration, side effect mitigation, and plans for follow-up after release. These clarified workflows allowed MOUD dosing to became more standardized with implementation of a pill line for dosing.

Specifically, residents were initially receiving sublingual buprenorphine-naloxone in designated dosing rooms monitored by nursing and security staff. This was a staffing intensive decision made to ensure compliance and reduce diversion. After some time functioning under this medication methodology and visiting the Maine Department of Corrections to review their distribution model for MOUD, sublingual buprenorphine dosing was shifted from designated dosing rooms to a pill-line administration in June 2023. When dosing shifted to the "give and go" model, security staff were provided additional education on the process and efforts to monitor and mitigate diversion of MOUD specifically as they have always played a vital role in ensuring medication compliance during pill-line administration. This mirrored the administration of all other prescription medications within the NHDOC. The shift included more observation when residents left the pill line and returned to their unit, increased frequency of spot checks and room searches, as well as the occasional presence of specially trained canines to assist with searches. Uniquely in correctional facilities, trained canines are looking for pharmaceuticals that are not illicit in the community.

To ensure all providers and staff involved in the MOUD program worked in concordance, a multidisciplinary MOUD Administrative team was implemented. The team meets weekly to discuss cases, program operations, and policies. This process is a model the NHDOC has used in the past associated with chronic pain management. Aside from medical and mental health providers, inclusion of pharmacists was important to discuss trends in MOUD best practices, barriers to product availability and medication procurement. To treat the maximum number of residents, the pharmacy team led efforts to switch from sublingual to tablet buprenorphine formulations, which were more difficult to divert because it is a challenge to hide in one's mouth and lower in cost. Product availability of MOUD was another significant challenge. The pharmacist team occasionally had to change medication manufacturers to obtain a supply of the most cost-effective medication formulation. The pharmacy team also worked closely with providers and nursing staff to provide support on dosing, product packaging and storage.

Beyond education on the MOUD program and workflow, extensive educational programming on OUD and MOUD was offered to medical providers and staff at the NHDOC facilities to enhance knowledge about OUD and MOUD, and address myths and misconceptions about MOUD. This education was coordinated

and often delivered by the Addiction Nurse Coordinator in the NHDOC. Training to specifically address myths and misconceptions of security staff regarding SUD was key to gathering support for MOUD expansion and promoting shared understanding across the facilities. It was commonplace for officers to advocate for MOUD to be discontinued due to concerns about diversion and illicit use of controlled medications. Mandatory education as well as ongoing updates about the MOUD program were provided in several forums to staff, including monthly Stakeholder Meetings which involved security and nursing. Presentations that included information and supporting statements from the Americans with Disabilities Act (ADA), American Civil Liberties Union (ACLU), Federal Bureau of Prisons, American Society for Addiction Medicine (ASAM) and the Substance Abuse and Mental Health Services Administration (SAMHSA) were extremely beneficial in gaining staff buy-in and promoting understanding. To continuously provide updates on best practices and foster communication, educational programming was offered frequently.

Access to external experts

In addition to education provided from internal staff and providers, engaging external experts on MOUD to provide support and training to providers and mental health staff frequently occurs. The EXIT-CJS study also held annual in-person trainings and bi-weekly Zoom trainings for staff and providers to provide education and support on treating patients with OUD using extended-release naltrexone and buprenorphine. These trainings also reviewed study procedures, provided an overview of treatment with extended-release buprenorphine and offered case consultation. Clinical staff joined learning collaborative sessions with clinicians from the other study sites to discuss cases and challenges. These bi-weekly meetings provided an opportunity to ask specific questions about MOUD, especially the extended-release formulations. Experts on MOUD treatment and treatment with extended-release medication formulations were available for consultation. This education about both oral and injectable agents along parallel pathways led to synergy between EXIT-CJS recruitment and NHDOC MOUD program expansion.

Aside from trainings, EXIT-CJS study recruitment efforts increased awareness about MOUD treatment options among residents and staff. Starting in August 2022, the EXIT-CJS study employed a patient navigator to support recruitment and engagement of resident participants and provide referrals and education about the study. The patient navigator was a liaison between participants, the research team, and the NHDOC medical team and staff. The patient navigator identified residents with an OUD diagnosis within 6 months of release and screened them for study eligibility. Networking with NHDOC case managers, medical providers and security officers occurred synergistically with recruitment, allowing for informal education about MOUD and increased awareness of available MOUD options. Informational flyers about the study and MOUD options were designed and posted on residents' units and tablets. The patient navigator presented information to residents at educational fairs on a regular basis. The patient navigator also attended regular meetings with the NH Reentry Task Force to help facilitate participant reentry into the community. In addition, the patient navigator coordinated release efforts with medical providers and case managers and kept in contact with the classifications team to ensure participants received study materials and were connected with treatment prior to release. Word of mouth quickly spread amongst the resident population that there was an additional resource person that could guide them to OUD support, in addition to their NHDOC case manager to assist with re-entry and care coordination. These efforts educated staff and residents about MOUD options, and continually promoted awareness of OUD and available treatment options. This patient navigator complemented the existing three NHDOC reentry care coordinators funded through the State Targeted Response grant.

Individual-level factors

An overall change in culture and attitudes toward MOUD resulted from discussions between medical providers, experts on addiction treatment, multidisciplinary staff, security, and residents which supported an individualized approach to specific resident challenges. With general practices around initiation, titration, and diversion becoming more standardized, providers and staff shifted to a programmatic focus on addressing individual-level challenges to providing MOUD in a carceral setting, including addressing knowledge deficits among providers in prescribing (for example, procedures for managing residents requests for higher doses of medication) and educating residents on individual-level barriers to care (for example, improving understanding of common and rare side effects of MOUD). Resulting discussions between providers, experts on SUD treatment, staff and residents supported a culture change in attitudes about MOUD where treatment was more widely encouraged and criticism, such as a cited propensity for drug diversion, waned over time with increased education of and outreach to security staff.

Residents also reported enhanced trust in MOUD through engagement with the EXIT-CJS study. By having security clearance to move within the facilities, the patient navigator was able to meet in-person with interested residents and with NHDOC staff. Residents stated

that meeting with a non-NHDOC partner to discuss treatment options facilitated trust and interest in MOUD.

Discussion

In response to rising rates of overdose mortality and residents with OUD diagnoses, the NHDOC has engaged in concerted efforts to expand the provision of MOUD and address residents' needs. From 2021 to 2023, the NHDOC experienced a substantial increase in the number of residents with OUD treated with naltrexone and buprenorphine, treating more than an estimated 80% of residents with moderate to severe OUD in 2024, this represents 32% of the total incarcerated population. Concurrently, statewide data in NH demonstrates a reduction in opioid overdose and death from 2022 to 2023 and into 2024 (New Hampshire Information and Analysis Center, 2024). Expanding access to MOUD in carceral settings is critical to reducing opioid use, improving treatment engagement post-release and reducing opioid-related mortality (Moore et al., 2019), especially due to the high risk of opioid overdose mortality post-release (Binswanger et al., 2007, 2020). Aside from expanding access to life-saving medications, staff at the NHDOC also noted that increased access to MOUD may have contributed to reductions in MOUD demand and diversion. Both in the community and in carceral settings, patients have cited lack of access to MOUD and unmet treatment need as motivators to diverting buprenorphine (Evans et al., 2022, 2023; Rubel et al., 2023). Future studies should examine how improved MOUD access in carceral settings reduces the demand for diverted buprenorphine (Gryczynski et al., 2021; Rubel et al., 2023; Whaley et al., 2023).

The expansion of MOUD at the NHDOC occurred in a synergistic way with recruitment for the EXIT-CJS study, and was largely driven by policy, organization, and individual-level changes within the NHDOC and the NHDOC MOUD program. With the collaboration of the EXIT-CJS study and the support of leadership within the NHDOC, many challenges to providing MOUD at the NHDOC have been addressed. At the policy level, elimination of the federal DATA-Waiver (X-Waiver) Program allowed all providers to prescribe MOUD without any quantity limits as had previously existed under the X-Waiver. Previously, all providers were required to attend an eight-hour training prior to receiving approval to prescribe. This was a substantial barrier, as providers also needed to complete extensive professional training. After receiving the X-Waiver, providers were limited on the number of residents for whom they could prescribe. National prescribing data indicate that while elimination of the X-Waiver did not increase the number of providers prescribing buprenorphine, the number of residents treated by providers increased (Roy et al., 2024). Allowing providers to treat a higher number of residents may be particularly important for expanding access in a carceral setting. At the NHDOC the same phenomenon occurred where lifting the restriction on the number of patients led to providers feeling fully able to prescribe suboxone freely such that all providers eventually treated all eligible patients they managed with OUD. Expanded funding through a NH Department of Health and Human Services grant was also crucial to support the growing cost of MOUD treatment. Nationally, carceral systems have identified funding for medication and clinical staff as massive barriers to expanding MOUD programs (Ferguson et al., 2019; Knudsen et al., 2011; Scott et al., 2021; Zaller et al., 2022). While grant funding is helpful to support MOUD expansion in the short-term, long-term policy changes to support coverage of MOUD are crucial, including Medicaid expansion through waivers of the Medicaid Inmate Exclusion Policy allowing for coverage of some health services prior to release (Edmonds, 2021; Zaller et al., 2022). With variable funding policies across states, changes to state-level MOUD funding in carceral systems may be necessary (Knudsen et al., 2011).

Caring for residents with OUD within a carceral setting takes collaboration from all disciplines, including security and carceral system leadership, to be effective. Over the last decade at the NHDOC, the level of commitment, education, collaboration, and support for care of residents in prison who have a SUD has grown tremendously. Support from leadership is imperative to adopting MOUD programs in carceral settings (Pivovarova et al., 2022), and leadership at the NHDOC consistently updated and supported policies advancements in this program. The MOUD team within the NHDOC consists of medical providers, psychiatric providers, mental health providers, pharmacists, nurses, social workers, licensed alcohol and drug counselors and security staff. This multidisciplinary team was crucial to recommending positive changes and overcoming challenges at any level within the NHDOC. A shortage of X-waivered staff providers posed a major challenge to expanding the NHDOC MOUD program until this federal change occurred. With leadership support, addressing barriers to hiring new staff and retaining existing staff and supporting a full-time Addiction Nurse Coordinator were major drivers of program continuity and expansion. Within the carceral system nationally, stabilizing staffing issues is crucial for expanding MOUD programs and providing safe and effective care (Knudsen et al., 2011; Morris & Edwards, 2022; Rosen et al., 2024). In addition to providing more funding for staff in carceral settings, considering innovative methods for hiring and retaining staff is warranted.

One of the most difficult challenges in the provision of healthcare in a correctional facility is medication misuse

and diversion, along with residents being strong-armed for drugs. In carceral settings, providers face unique challenges when reviewing patient cases regarding diversion of medications. Providers practicing in correctional healthcare settings need to balance intentional diversion of medications with the intent to engage in criminal conduct versus a patient being strong-armed and then take measured treatment planning steps to balance the delivery of optimal care for a resident and considering their safety and the security of the facility. Engaging a multidisciplinary team on efforts to streamline processes for managing medication diversion were also crucial during MOUD program expansion.

Providing education and training in carceral settings is also crucial for disseminating information about evidence-based OUD treatment. This education must be provided to all staff in a carceral setting to shift attitudes and adopt new processes for treating OUD, including security staff (Ferguson et al., 2019; Scott et al., 2021). For example, more research is needed to identify what form, duration, and type of counseling is most effective for people on MOUD who are incarcerated (Zaller et al., 2022). Educating staff on evolving recommendations caused the program to shift from a counseling-first model, to a model that allowed residents to receive MOUD faster and without immediate enrollment in mental health services. Exploring optimal models of education and considering how to collaboratively include external partners and professional organizations in training of staff could support the implementation of MOUD in carceral settings.

Synergy with the EXIT-CJS study also contributed to program expansion. Despite the challenges of conducting research in carceral settings (Cislo & Trestman, 2013), partnerships with academic institutions and research teams can support MOUD program expansion. Education and medical clinician support by external experts in addiction treatment occurring during study implementation dovetailed with education and training occurring with the NHDOC, providing further support and knowledge to medical providers, mental health providers, and other staff. Engaging a study patient navigator within the facilities to meet with staff and residents supported study recruitment efforts and promoted additional trust in the MOUD program. By being onsite and moving throughout the facilities, the patient navigator facilitated conversations about the study with residents and staff and integrated the patient navigator into the correctional facilities. The patient navigator strengthened relationships with the medical, clinical, addiction treatment, case management and security teams to increase awareness and understanding about the study. This proactive approach reduced impediments to MOUD treatment and afforded commitment from multiple resources. Although this was intended to support study recruitment and engagement in the extended-release medications provided by the EXIT-CJS study, patient navigation has been examined as a stand-alone intervention to increase engagement with health services for vulnerable or complex residents involved in the criminal legal system (Binswanger et al., 2015; Dauria et al., 2022; Myers et al., 2017, 2018). While results have been mixed regarding whether patient navigation supports improved engagement in MOUD treatment for people with OUD in carceral settings (Farabee et al., 2020), having external staff who offer education and treatment for OUD may affirm for patients that the treatment offered during incarceration is as valid as treatment offered in the community, creating a more holistic approach to a traditionally stigmatized condition.

This small, observational description of MOUD expansion has limitations. The first critical limitation is the observational nature and the informal methodology used to describe the expansion of MOUD at the NHDOC. This project was originally conceptualized as part of a quality improvement initiative. Qualitative explorations of implementation should include structured interviews, focus groups or systematic data collection guided by a conceptual or theoretical framework (Hamilton & Finley, 2019). This description of program expansion did not use robust qualitative methodology to document the MOUD implementation process at the NHDOC. Due to time and cost limitations, it was not feasible to employ more rigorous methodologies, such as interviews, focus groups, or ethnographic observation. Not all stakeholders involved in the implementation process were included in the write up of this expansion effort, potentially leading to missed information about the implementation process. No formal qualitative interview guide was developed or used, reducing the rigor and systematic nature of data collection. Despite these methodological limitations, details on the factors contributing to program expansion at the NHDOC were included because of their potential to provide useful information to other carceral systems seeking to expand their MOUD program. The NHDOC is a small prison system in a predominately rural region, which may limit the generalizability of findings. Characteristics of carceral systems, including their size, organization, and structure, may impact the factors influencing MOUD program expansion. Future studies should use rigorous prospective designs, include structured qualitative methodologies, and utilize existing implementation science frameworks to better explicate factors critical to expanding MOUD programs in carceral settings.

Despite these limitations, this work suggests that comprehensively addressing barriers at multiple levels is necessary to effectively expand MOUD prescribing in carceral settings. Advocating for policies supporting MOUD provision in carceral settings, while

simultaneously addressing workforce challenges, educational gaps, and trust and stigma are all necessary components to implement MOUD in prisons. Additionally, partnering with external organizations, including academic research, can further promote knowledge about MOUD and trust among residents and staff.

Abbreviations

US	United States
OUD	Opioid use disorder
SUD	Substance use disorder
MOUD	Medication for opioid use disorder
FDA	Food and Drug Administration
NHDOC	New Hampshire Department of Corrections
MA	Massachusetts
JCOIN	Justice Community Opioid Innovation Network
EXIT-CJS	Long-acting buprenorphine vs. naltrexone opioid treatments in criminal justice system-involved adults study.
EHR	Electronic health record
ASAM	American Society of Addiction Medicine
SOR	State Opioid Response.

Acknowledgements
The authors gratefully acknowledge leadership and partners at the New Hampshire Department of Corrections, including the Division of Medical and Forensic Services, the Division of Rehabilitative Services, Security staff, Nursing staff, Clinical Case Managers and Licensed Alcohol and Drug Counselors (LADCs), as they were all instrumental throughout the study. Additionally, the authors wish to thank ROAD to a Better Life for their partnership.

Author contributions
NC, PE, HE, LM, DY, ES wrote the initial manuscript draft. MM, MP, HG, AC, LS, KB, JL, and LM critically edited the manuscript. NC completed the data abstraction. All authors read and approved the final manuscript.

Funding
Funding for the EXIT-CJS study was provided by NIDA U01DA047982 (Principal Investigators: Lee, Farabee, Marsch, Schwartz, Springer, Waddell).

Data availability
The datasets used and/or analyzed during the current study are not publicly available.

Declarations

Ethics approval and consent to participate
The New Hampshire Department of Corrections data was gathered as part of a quality improvement effort and therefore approval from an ethics board was not required. All materials and methods for the EXIT-CJS study were approved by the New York University School of Medicine Institutional Review Board.

Competing interests
Dr. Lee has received in-kind study drug from Indivior and Alkermes for federally funded trials. Dr. Marsch is affiliated with Square2 Systems and is a consultant for Click Therapeutics and Boehringer Ingelheim. These relationships are extensively managed by her employer, Dartmouth College.

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Received: 20 December 2024 / Accepted: 25 March 2025
Published online: 08 April 2025

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