Shifting Medication Treatment Practices in the COVID-19 Pandemic: A Statewide Survey of Pennsylvania Opioid Treatment Programs

Noa Krawczyk, PhD, Hannah Manitates, MSPH, Eric Hulsey, DrPH, Jennifer S. Smith, BS, Ellen DiDomenico, BA, Elizabeth A. Stuart, PhD, Brendan Saloner, PhD, and Sachini Bandara, PhD

Objectives: We sought to understand how opioid treatment programs (OTPs) adapted OTP operations to the COVID-19 pandemic and new federal regulations around methadone and buprenorphine.

Methods: In fall 2020, we conducted an online survey of all 103 OTPs licensed by the Pennsylvania Department of Drug and Alcohol Programs, including clinical directors. Survey domains included changes to methadone take-home and telehealth practices; overdose and diversion prevention tactics; perceptions regarding how such changes influence patient well-being; and financial/operational concerns related to the new policies and practices. We calculated descriptive statistics and conducted Chi-square test to test for differences between not-for-profit versus for-profit and large versus small OTPs.

Results: Forty-seven percent (46%) OTPs responded to the survey. 10% and 25%, respectively, endorsed offering telephone and video-based telemedicine buprenorphine induction. Sixty-six percent endorsed extending take-home supplies of methadone, but most indicated that these extensions applied to a minority of their patients. Most respondents agreed that provision of buprenorphine via telehealth and extended take-home methadone reduced patient burden in accessing medications and prevented exposure to COVID-19, while not significantly increasing risk of overdose. We did not find major differences in COVID-19 practice modifications by nonprofit status or size of OTP.

Conclusions: In Pennsylvania, the COVID-19 pandemic led to rapid changes in provision of opioid treatment services. Findings on relatively low uptake of longer methadone take-home regimens and virtual buprenorphine initiation despite general support for these practices imply a need to further develop guidelines for best clinical practices and understand/address barriers to their implementation.

Key Words: buprenorphine, COVID-19, methadone, opioid treatment programs, opioid use disorder

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additional criteria set forth by individual OTPs, such as perceptions of the home environment and behavior at clinic. In addition, MOUD patients were often expected to abide by many requirements to remain in care, including frequent drug screening and attending psychosocial services such as counseling or self-help groups.

In March 2020, concerns about COVID-19 led the Drug Enforcement Administration and Substance Abuse and Mental Health Services Administration to relax treatment requirements for MOUD. This included expanding limits on take-home doses of methadone (14 days for less stable patients and 28 days for highly stable patients, based on risk criteria introduced over a decade earlier). Drug Enforcement Administration and Substance Abuse and Mental Health Services Administration additionally approved the use of telemedicine – including telephone only – to initiate buprenorphine. These changes created the potential to drastically reform traditional OTP protocols, which included substantial requirements for in-person evaluations and frequent patient monitoring. Although decades of research describe the burden and disruption frequent visits placed treatment adherence, concerns about medication diversion, misuse and overdose were often noted as necessitating this highly rigid structure. Thus, the new shift in MOUD regulations raises questions about how OTPs adapted operations, and how this has affected the well-being of patients.

To date, limited research explores the impact of these new regulations. One study surveyed 8 OTPs in Connecticut during the pandemic and found an increase in uptake of methadone take-home doses and use of telehealth for psychosocial services, with no signs of increased overdose deaths. A survey of methadone patients in North Carolina found variability in experiences with take-home doses across clinics, yet little evidence of diversion. A qualitative study of OTP providers conducted by Hunter et al, however, found mixed perspectives by providers on new OTP regulations and their impact on patients. More research is needed to understand how federal regulatory changes have influenced OTP practices across different states, and whether OTP leaders support long-term adoption of these policies beyond the COVID-19 pandemic. In this study, we explored these questions while focusing on Pennsylvania, which has the fifth highest drug overdose death rate in the country (35.6 per 100,000 people in 2019), and yet historically held particularly strict regulations over OTPs licensed by the Pennsylvania Department of Drug and Alcohol Programs (DDAP).

**METHODS**

**Target Population**

We designed a 25-minute online survey aimed at clinical directors of all 103 DDAP-licensed OTPs. Facilities and contact information were identified via a database of licensed OTPs maintained by DDAP. In September 2020, clinical directors were contacted via email and invited to participate in a voluntary research study that could help inform State agencies on how to best support the needs of OTPs throughout the pandemic. Over the following 2 months, 2 additional reminder emails were sent to complete the survey. The study was determined to be exempt from Human Subjects review by the Johns Hopkins Institutional Review Board.

**Survey Domains and Items**

Respondents were asked questions in domains including (1) Changes in MOUD provision; (2) Adaptation of procedures for urine drug screening and psychosocial services; (3) Overdose and diversion prevention tactics; (4) Clinical director perceptions regarding how changes have influenced patient well-being; and (5) Financial and operational concerns related to the new policies and practices. Additional domains reported in a separate manuscript include procedures adopted for COVID safety and risk mitigation. Clinical directors were asked to indicate which services and practices were used before versus after the start of the COVID-19 pandemic. These items included a combination of multiple choice and free response questions. Survey items related to perceptions regarding policy and practice changes were asked using a 4-point Likert scale ranging from strongly agree to strongly disagree to minimize social desirability bias for appearing neutral. Participants were asked to denote whether they agreed or disagreed with a range of statements related to (A) Increased methadone take home allowances; (B) New provisions on delivering buprenorphine via telemedicine; and (C) Perceptions on which changes should be made permanent after the COVID-19 pandemic. Finally, survey participants were asked about a range of concerns related to sustaining OTP operations during COVID-19. All items were modified based on review and piloting by an OTP physician not eligible for the survey. Surveys were administered using Qualtrics and analyses were performed using R 4.0.2 and Excel 16.43. The survey instrument is available in Supplemental Digital Content 1, http://links.lww.com/JAM/A334.

**Analysis of Survey Responses**

We derived summary statistics (mean and frequency) for each survey item for participating OTPs. For Likert scale measures, we report the frequency of endorsing strongly agree and agree categories. Given our hypothesis that smaller and larger OTPs may have responded differently to COVID-19 risks, we tested for any statistical differences in practices across small versus large OTPs using Chi-squared tests with a Yates continuity correction, with OTPs with a volume of clients larger than the median considered to be large. We also tested for differences in for-profit versus not-for-profit OTPs to assess whether different financial incentive structures may be associated with different treatment practices. Significance was set at the $P < 0.05$ level and percentages were calculated amongst those who responded to each particular item.

**RESULTS**

**Characteristics of Participating OTPs**

Of the 103 invited Pennsylvania OTPs, 47 provided complete surveys, a response rate of 46%. Table 1 displays characteristics of OTPs that participated in the survey, including MOUD and telehealth services offered before COVID-19.
TABLE 1. Characteristics of Participating Pennsylvania Opioid Treatment Programs (OTPs) Before COVID-19

| OTP Characteristic                        | Median (IQR)                  |
|-------------------------------------------|-------------------------------|
| Number of full-time staff (N = 46)        | 21 (15–40)                    |
| Number of clients (N = 44) 264            | (180–427.5)                   |
| Organization type (N = 47)                |                               |
| For-profit organization                   | 30 (64%)                      |
| Non-for-profit organization/academic institution | 17 (36%)                    |
| Offered the following OUD tx services before COVID-19 (N = 44) |                               |
| Methadone maintenance                     | 23 (52%)                      |
| Methadone for detoxification/tapering*     | 9 (20%)                       |
| Buprenorphine maintenance                 | 41 (93%)                      |
| Buprenorphine for detoxification/tapering* | 5 (11%)                      |
| Extended-release naltrexone maintenance   | 17 (39%)                      |
| Methadone for detoxification/tapering†    | 49 (9%)                       |
| None of these                             | 33 (73%)                      |

*Buprenorphine for detoxification/tapering was more likely to be offered in smaller versus larger OTPs (35% vs 4.8%, *P* = 0.04).
†Telehealth services related to peer outreach and case management were more commonly used in non-for-profit versus profit organizations before the pandemic (37.5% vs 6.9%, *P* = 0.03).

Note: Survey questions in these domains were asked of all 47 respondents. The total number of respondents that completed each domain (the denominator for each percentage) are noted by the domain name.

IQR indicates interquartile range; OTP, opioid treatment program.

OTPs varied substantially in size, with a median of 21 full-time equivalent staff (interquartile range 15–40) and 264 clients (interquartile range 180–427.5). The majority of OTPs were for-profit organizations (N = 30, 64%). The most common MOUD service offered before COVID-19 was methadone maintenance (N = 41, 93%) followed by buprenorphine maintenance (N = 23, 52%), and extended-release naltrexone maintenance (N = 17, 39%). Methadone and buprenorphine for detoxification/tapering was offered less frequently (N = 5; 11% and N = 9; 20%, respectively) as was short term use of extended-release naltrexone (N = 4, 9%). Of OTPs that offered any buprenorphine treatment, 71% prescribed buprenorphine by a waivered provider to be filled at a community pharmacy and 58% dispensed buprenorphine on site. The majority of OTPs (N = 33, 73%) offered no telehealth services before COVID-19, with few using some telehealth for peer outreach/case management check-ins (N = 8, 18%), counseling appointments (N = 7, 16%) or buprenorphine refills/check-ins (N = 3, 7%). When testing for differences in pre-COVID characteristics based on OTP size and for-profit status (Supplemental Digital Content 2, http://links.lww.com/JAM/A335), we found that buprenorphine for detoxification/tapering was more likely to be offered in smaller versus larger OTPs (35% vs 4.8%; *P* = 0.04) but did not differ significantly by non-for-profit status. Telehealth services related to peer outreach and case management were more frequently used by non-for-profit versus for-profit organizations (37.5% vs 6.9%, *P* = 0.03) but did not differ by OTP size.

Changes in Buprenorphine Practices

The most commonly reported change to buprenorphine maintenance treatment was shifting psychosocial services, including counseling/self-help groups, to virtual platforms (N = 14; 70% (Table 2). Fifty percent (N = 10) and 40% (N = 8) of OTPs, respectively, reported offering telephone or video-based telemedicine appointments for buprenorphine follow up appointments, but only 10% (N = 2) and 25% (N = 5) of OTPs, respectively, reported offering telephone or video-based telemedicine appointments for buprenorphine induction. Thirty-five percent (N = 7) of OTPs reported offering longer days supply of buprenorphine. Fifteen percent (N = 3) required less frequent drug screening and 15% (N = 3) relaxed counseling and mutual aid group attendance (eg, narcotics anonymous or SMART recovery) requirements. Across all MOUD services, no respondents reported shifting to remote urine drug screening practices. When OTPs that reported offering longer days supply of buprenorphine were asked about what strategies were employed to reduce diversion/adverse events, OTPs most commonly reported conducting regular drug screening (N = 5, 71%), random drug screening (N = 4, 57%) and random call backs of medications (N = 4, 57%). We found no significant difference in buprenorphine changes by non-for-profit status or OTP size.

Changes in Methadone Practices

The most commonly reported change to methadone treatment (Table 2) was shifting psychosocial services to virtual platforms (N = 32, 84%), extending take-home supplies of methadone (N = 25, 66%), and offering telephone appointments for methadone follow ups (N = 23, 61%). When OTPs that reported extending take-home supplies of methadone were asked about which criteria were taken into consideration for decisions regarding take-home doses, OTPs most commonly reported clinical severity (N = 35, 90%) and time in program (N = 32, 82%), followed by demographic and socioeconomic characteristics (N = 23, 59%). When asked about what strategies were employed to reduce diversion/adverse events related to longer-methadone take homes, OTPs most commonly reported random drug screening (N = 24, 96%) and requiring return of empty bottles (N = 24, 96%), followed by requiring medication lock boxes that limits when patients can access their methadone (N = 23, 92%). The only significant difference based on OTP size or for-profit status was that regular drug screening was more often used to reduce methadone diversion/adverse events in for-profit versus non-for-profit OTPs (87.5% vs 33.35%, *P* = 0.02).

Although most OTPs indicated that they offered extended methadone take-homes following new COVID-19 regulations, findings suggest the majority of patients did not receive 28- and 14-day methadone take-home doses (Fig. 1). As many as 71% of OTPs indicated that none of their patients received 28-day take home doses. A quarter (24%) indicated that only 1%–25% of patients received 28-day take homes and only 5% indicated that 26%–50% of their patients received 28-day take homes. No OTPs indicated that over half (51%–100%) of patients received 28-day take homes. Fourteen-day take homes were more frequently used, although still for a minority of patients: A third (31%) of OTPs indicated that none of their
TABLE 2. Changes in Medication Treatment Practices Following COVID-19

| OTP Characteristic | N (%) |
|--------------------|-------|
| Modifications to buprenorphine maintenance treatment (n = 20) | |
| Longer days supply | 7 (35%) |
| Suspended or less frequent drug screening | 3 (15%) |
| Relaxed counseling/self-help requirements | 3 (15%) |
| Offered video appointments for buprenorphine induction | 14 (70%) |
| Offered video appointments for buprenorphine follow ups | 5 (25%) |
| Offered phone appointments for buprenorphine induction | 8 (40%) |
| Offered phone appointments for buprenorphine follow ups | 2 (10%) |
| Strategies to reduce buprenorphine diversion/adverse events in OTPs that allocated longer buprenorphine days supply (N = 7) | |
| Requiring medication lock boxes | 0 (0%) |
| Requiring return of empty bottles | 0 (0%) |
| Random call-backs of medication | 4 (57%) |
| Random drug screening | 4 (57%) |
| Regular drug screening | 5 (71%) |
| Modifications to methadone maintenance treatment (n = 38) | |
| Longer take-home supplies | 25 (66%) |
| Suspended or less frequent drug screening | 3 (8%) |
| Relaxed counseling/self-help requirements | 5 (13%) |
| Offered counseling/self-help groups virtually | 32 (84%) |
| Offered video appointments for follow ups | 19 (50%) |
| Offered telephone appointments for follow ups | 23 (61%) |
| Criteria used in decisions around methadone take-home allocations (n = 39) | |
| Time in program | 32 (82%) |
| Clinical severity | 35 (90%) |
| Demographic or socioeconomic characteristics | 23 (59%) |
| Other | 21 (54%) |
| Strategies to reduce methadone diversion/adverse events in OTPs that allocated longer methadone take-homes (N = 25) | |
| Requiring medication lock boxes | 23 (92%) |
| Requiring return of empty bottles | 24 (96%) |
| Random call-backs of medication | 19 (76%) |
| Random drug screening | 24 (96%) |
| Regular drug screening | 17 (68%) |

Note: Survey questions in these domains were asked a portion of the total respondents, based on prior answers (See survey instrument in Supplemental Digital Content 1, http://links.lww.com/ JAM/A334). Domains related to buprenorphine treatment were asked of 24 total respondents who answered questions about buprenorphine treatment practices before COVID, and domains related to methadone treatment were asked of 41 respondents who answered questions about methadone treatment practices before COVID. The total number of respondents that completed each domain (the denominator for each percentage) are noted by the domain name.

OTP indicates opioid treatment program.

FIGURE 1. Proportion of patients estimated to receive methadone take-home doses post-COVID-19 (N = 39 for 14-day, N = 28 for 28-day). Note: These survey questions were asked of 41 total respondents who answered questions about methadone treatment practices before COVID in previous answers (see survey instrument in Supplemental Digital Content 1, http://links.lww.com/JAM/A334). The total number of respondents that completed each question (the denominator for each percentage) are noted in the title.

patients received 14 day take homes, 33% indicated that only 1%–25% of their patients received 14 day take homes, 28% indicated that 26%–50% of patients received 14 day take homes, and only 8% of OTPs indicated that 51%–75% of clients received 14 day take homes. Practices did not differ by non-profit status or OTP size.

Perceptions Regarding Changes in Medication Treatment Policies and Practices

The proportion of clinical directors that strongly or somewhat agreed with each statement is presented in Figure 2. In regards to provision of buprenorphine via telemedicine (N = 8), 50% agreed that virtual buprenorphine prescribing increases diversion and adds a substantial risk that children or others could accidentally ingest it, but few (13%) agreed that virtual buprenorphine prescribing increases risk of overdose. Most (88%) and all (100%) respondents, respectively, agreed that virtual buprenorphine prescribing is a less burdensome way for patients to access medication and prevents exposure to COVID-19. In regards to increased methadone take-home allowances (N = 25), 60% agreed that take-home
FIGURE 2. Participant perceptions on changing OTP policies and practices. Note: Survey questions in these domains were asked of a portion of the total respondents, based on prior answers (See survey instrument in Supplemental Digital Content 1, http://links.lww.com/JAM/A334). Domains related to buprenorphine treatment were asked of 13 total respondents who endorsed providing telehealth buprenorphine visits, domains related to methadone treatment were asked of 25 respondents who endorsed providing take-home methadone and policy perceptions were asked of all 47 respondents. The total number of respondents that completed each domain (the denominator for each percentage) are noted by the panel name. OTP indicates opioid treatment program.
methadone increases diversion, but only 32% agreed that take-home methadone adds a substantial risk that children or others could accidentally ingest methadone or that it increases risk of overdose. Almost all (96%) and all (100%) participants, respectively, agreed that take-home methadone is a less burdensome way for patients to access medication and prevents exposure to COVID-19.

When asked about maintaining certain changes permanently post-pandemic (N = 38), 79% of participants supported (agreed or strongly agreed with) maintaining more flexibility on length of methadone take-homes. Over half (55%) supported maintaining induction of buprenorphine via telemedicine if requiring video, but only 39% supported maintaining induction of buprenorphine via telemedicine not requiring video. All (100%) supported that there be equal reimbursement of telemedicine and in-person services. Lastly, 50% supported maintaining less frequent requirements for counseling/behavioral therapy or self-help groups but only 26% supported maintaining reduced frequency of drug screening. Support did not differ by non-for-profit status or OTP size.

Financial Operations

When asked about concerns related to sustaining OTP clinic operations during COVID-19, 52% (N = 13) strongly or somewhat agreed that they were concerned about the ability of their clinic to financially sustain operations. When asked about the sources of the financial strain, of those who endorsed a worsened financial situation (N = 21), 57% selected fewer counseling/behavioral therapy appointments and 48% selected fewer in-person visits for medication receipt. 52% of participants agreed that they experienced reduced income due to fewer client visits and 39% due to reduced funding from state/federal programs.

DISCUSSION

Pennsylvania OTPs modified multiple practices in response to the COVID-19 pandemic, mostly by shifting psycho-social services to virtual platforms, increasing use of telemedicine for buprenorphine and methadone follow up appointments, and increasing methadone take-home doses. At the same time, a minority provided longer days supply of buprenorphine, offered telemedicine appointments for buprenorphine induction, or reduced requirements for urine drug screening or psychosocial services. Moreover, most OTPs endorsed longer methadone take-home practices, but the vast majority indicated that less than half of patients received 14 or 28-day methadone take-home doses. The variation in practice changes by OTPs in the early months of the pandemic is consistent with findings from OTPs in other regions19–21 and raises important considerations for implementing long-term changes in policies and procedures governing OTP treatment practices.

Shifts in Buprenorphine

Changes that allowed for initiation of buprenorphine via video or telephone without requiring an initial in-person exam led to widespread uptake of telemedicine-based buprenorphine by providers across the country.26–31 Still, our findings reveal that the majority of Pennsylvania OTPs did not engage in uptake of this new practice. This is despite general agreement by clinical directors that buprenorphine provision via telemedicine reduces treatment burden and COVID-19 risk and does not increase overdose risk. This relatively low uptake of telemedicine-based buprenorphine induction is notably different than what has been reported in other settings, such as primary clinics and harm reduction organizations, which have supported the expansion of telephone-based buprenorphine as a more accessible path to treatment.32,33 This differential uptake may reflect a more clinically complex OTP patient population, especially under challenging circumstances of the pandemic, or perhaps the culture of OTPs that has historically relied on heavy vigilance and in-person contact.12 Still, there were varying perspectives among those surveyed, with half of clinical directors agreeing and half disagreeing that telemedicine-based buprenorphine increases diversion or poses a risk of accidental ingestion to others. A prior qualitative study with OTP clinicians in a national sample similarly found mixed perspectives about the value of telemedicine, highlighting concerns, such as inability to build rapport with patients and reduced reimbursement rates from remote visits, whereas also identifying benefits like gaining greater insight into patients’ home environments.21 More work is needed to understand concerns around telemedicine and how treatment programs can promote safe and quality care while ensuring access.34 This is especially important as legislation is being considered to permanently allow for telemedicine-based buprenorphine-induction35 and training and buy-in from providers will be critical for successful uptake of these practices.

Shifts in Methadone

Most responding OTPs in Pennsylvania shifted practices towards providing longer take-home supplies of methadone, but that these allowances – especially for 28-day take homes – applied to a minority of patients. These findings are consistent with those of a survey of Connecticut OTPs that indicated most OTP patients remained ineligible for longer take-home regimens.19 Still, almost all clinical directors agreed that extended take homes were effective in reducing burden and COVID-19 risk and did not increase overdose risk. More work is needed to understand what specific patient characteristics clinics are using to assess eligibility for 14-day and 28-day take-homes, and to what extent take-home decisions are motivated by clinical considerations and patient preferences versus financial motives or cultural norms related to more frequent monitoring of patients.

One of the 2021 Office of National Drug Control Policy’s Drug Policy Priorities is to review and develop recommendations to modernize methadone treatment.26 Such a shift will require guidance for decision-making around take-home practices and considerations to balance methadone risks with patient safety and convenience, including the role of innovation in methadone safety strategies37 in mitigating concerns. Guidance is needed on how to incorporate patient preferences, clinical factors such as ongoing drug use, and psychosocial factors such as access to a safe storage space, competing childcare or work responsibilities, and distance from clinic. These will be important considerations for both the current OTP system and alternative
proposed models of methadone delivery, such as via community pharmacies. Empirical research on how shifts in take-home regimens affect patient outcomes will be critical to informing these guidelines. Lastly, it is essential that both changes in policies around telemedicine and methadone take-homes be accompanied by updated reimbursement practices to support a more flexible paradigm. States such as Massachusetts have already increased Medicaid reimbursement for OTPs to encourage continued use of safety precautions to mitigate COVID-19 risks.

**Shifts in Psychosocial Support and Urine Drug Screens**

Almost all participating OTPs shifted psychosocial services to virtual platforms. Although half of clinical directors agreed with requiring less psychosocial services long-term, few OTPs actually suspended or required less frequent counseling or self-help group participation for patients receiving MOUD. Almost no OTPs suspended or required less frequent drug screening, and few supported that such changes be implemented long-term.

The importance of mandating psychosocial services and drug screening as a condition of MOUD treatment has been a topic of debate, with many pointing to limited evidence on the added value of psychosocial treatment and to gaps in knowledge regarding optimal frequency or necessity of drug screening. Still, many providers and organizations consider these practices to be fundamental components of treatment, and may have considered them particularly central during the pandemic when patients were experiencing other hardships and interacting with clinics less frequently. Understanding drivers behind hesitation to reduce psychosocial treatment and drug screen requirements is critical for constructing a sustainable MOUD treatment system that prioritizes patient needs. This includes understanding the influence of such practices on patient treatment outcomes versus their role in sustaining OTP financial operations. We found, for example, that for-profit organizations were more likely to require regular drug screening as a method of mitigating methadone adverse events compared to non-for-profit organizations.

**Limitations**

This study has several limitations. First, surveys were voluntary, and responding OTPs may have unique features that are not representative of nonresponding OTPs across Pennsylvania. For example, approximately a quarter of nonresponding OTPs were not-for-profit, compared to 36% of respondents. Response rate varied by question. In particular, questions regarding modifications to buprenorphine had higher missingness. Second, questions related to practices, policies, and perceptions were based on self-report and may be subject to reporting or social desirability bias. Third, OTPs may have shifted practices over time based on local COVID conditions and clinical experiences, but we only captured changes that took place during September–November 2020. Fourth, findings on perceived impacts of policy changes were based on opinions of clinical directors rather than clinical outcomes data, and may not represent the experience or opinions of other staff or patients receiving services. Thus, future research should focus on objective patient outcomes, and perceptions of patients and other OTP staff. Fifth, the small number of OTPs in the state limits statistical power, particularly in stratified analyses.

**CONCLUSIONS**

The COVID-19 pandemic led to rapid changes in OTP practices as programs worked to adapt to social distancing measures and polices. Findings on low uptake of methadone take-home regimens and virtual induction of buprenorphine and continued reliance on frequent drug screening imply that policy change alone may not yield sustained shifts in OTP practices towards more flexible treatment. Long-term reformation of the U.S. methadone treatment system will likely require a financially approach that supports patient-centered regimens, and resources to support technical assistance and training to help OTPs adapt updated protocols. There is likely “no going back” after these drastic shifts in MOUD treatment norms, but effective change must involve input from patients who engage in treatment to ensure it meets their needs and those of the critical workforce that delivers these services. Continued efforts to build evidence and seek input during this pandemic can help build a stronger, more patient-centered, and dignifying system for treating OUD, reduce overdose and improve lives of people who use opioids.

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